

DISCUSSION DRAFT

The views and interpretations in this document are those of the author and should not be attributed to the World Bank, to its affiliated organizations, or to any individual acting in their behalf.

AGP- 20

RETURN TO THE REGIONAL
INFORMATION CENTER

THE PLANNING AND IMPLEMENTATION OF SMALL FARMER
DEVELOPMENT PROJECTS

AGREP Division Working Paper No. 20

Prepared by:

Iqbal Sobhan (consultant)
Economics & Policy Division
Agriculture & Rural Development Department

June 1977

TABLE OF CONTENTS

ACKNOWLEDGMENTS	ii
LIST OF TABLES	v
Chapter	
I. INTRODUCTION	1
Purpose of the Study	3
The Experience and the Perspective	4
A Caveat	8
The Data Background and Project Overview	10
The Research Approach	15
Some A Priori Hypotheses	16
Organization of the Study	17
II. THE METHODOLOGY, THE SAMPLE, AND THE VARIABLES	19
Factor Analysis	19
Causal Interpretations	22
The Sample	24
The Variables	25
Success Indicators	26
Other Variables	35
The Question of the Omitted Variables	43
III. THE FACTOR ANALYSIS	47
The First Factor (Full Sample)	51
The Second Factor (Full Sample)	54
The Third Factor (Full Sample)	56
The Fourth Factor (Full Sample)	58
Summary of Full Sample Results	59
Results from Subsets	61
Limitations of the Analysis	70
Conclusion	72
IV. THE POLICY IMPLICATIONS OF THE RESULTS	75
Group Action and Organization	75
The Political and Bureaucratic Aspects of Organization	80
Financial Commitment and the Question of Project Components	85

Impact of Selected Characteristics of Project Area	88
Conclusion	89
V. CONCLUSIONS AND RECOMMENDATIONS	92
APPENDIX	99
BIBLIOGRAPHY	106

LIST OF TABLES

1.	Summary Data on Projects Studied	11
2.	Description of Variables Utilized in the Study . .	27
3.	Factor Analysis of Thirty-one Rural Development Projects	48
4.	PARD: Factor Analysis of Sixteen Rural Development Projects	62
5.	SFD: Factor Analysis of Eight Rural Development Projects	65

CHAPTER I

INTRODUCTION

The essential difference between formulating viable models and implementing "plans" is similar to the difference between puzzle solving and problem solving. Puzzle solving is an exercise with a known answer, probably a unique one. Furthermore, a puzzle is something which has been deliberately created to test an individual skill in recognizing a particular pattern or applying an analytical principle. The pathways to a solution of a puzzle are determined, and perceiving them requires only a learned skill not innovativeness nor imagination. The implementation of rural development, on the other hand, falls within the purview of a problem-solving exercise. It is difficult to conceive of the unique solution. In fact, there seems to be a lack of consensus on what constitutes rural development itself. For instance, in a recent study done for the United Nations, five of the ten principal UN agencies possessed no definition of rural development as such, and only two of the ten had any means of monitoring not only what percentage of their activities might be classified as "rural development," but even what the actual end result of those activities were.¹

¹Obaidullah Khan and J. Tomas Hexner, A Turning

Behind the sudden recent preoccupation with rural development is the concern² to achieve greater equity in the distribution of the gains from economic growth. This focus by development economists on rural development has arisen because over three decades of effort in accelerated growth have had relatively little impact on the lives of rural people. Large elements of the rural population have not shared at all in the impressive gains achieved in both agriculture and industrial production in the developing countries.³ Large proportions of the rural poor live constantly on the brink of actual destitution. They are saved from starvation partly by their own efforts, partly by acts of providence, but more successfully by both. The world's rural people in general continue to live in environments and in economic and political circumstances that are intolerable to them and should be intolerable to the larger societies of which they are a part.

Yet, what exactly is rural development? Ideally, its objective is to propagate activities that result in the

Point: Poverty Oriented Rural Development and the U.N. System. Report to the Agriculture Coordination Committee of the United Nations, January 1976 (New York: United Nations, 1976), passim.

²Robert S. McNamara, President of the World Bank, Address to the Board of Governors, Nairobi, September 24, 1973 (Washington, D.C.: World Bank, 1973).

³Keith B. Griffin, "Policy Options for Rural Development," background paper for the Ford Foundation Seminar on Rural Development and Employment, Ibadan, April 9-12, 1973; Carl H. Gotsch, "Technical Change and the Distribution of Income in Rural Areas," American Journal of Agricultural Economics 54, no. 2 (May 1972): 326-341.

human ascent of man, "the ascent of all men in their integral humanity, including the economic, biological, psychological, social, cultural, ideological, spiritual, mystical, and transcendental dimension."⁴ Reality, of course, enforces the adoption of objectives having a more manageable form. Their main feature remains the economic well-being of the farmer as judged both by increased productivity and by increased wages. This focus on well-being raises the question of a possible distinction between agricultural development and rural development. The focus of rural development is not only on the existence and adoption of a technological package increasing productivity, but on activities that increase welfare as well. While rural development aims at increased productivity, past attempts indicate that an important part of rural development efforts is to motivate rural farmers as well as rural laborers to participate in development activities which are self-sustaining.

Purpose of the Study

The primary purpose of this study is to identify what can be done to increase the well-being and productivity of the small farmer in the Third World. The implementation of projects of rural development have not always been easy nor have the problems of implementation been very clear-cut.

⁴Denis Goulet, "An Ethical Model for the Study of Values," Harvard Educational Review 41, no. 2 (May 1971): 205-227

Many studies have focused on particular aspects specific to particular projects. This study attempts to gain more precise empirical knowledge of the interdependence of the economic and the non-economic aspects of implementing projects in rural development. It also attempts the identification of approaches or strategies that aid-giving agencies may adopt to improve both the design and the implementation of these projects.

In more specific terms, this study utilizes data developed by a research organization, Development Alternatives Incorporated (DAI),⁵ for the Agency for International Development (AID), and applies a methodology suited for the analysis of data that obviously suffer from multicollinearity. The data collected include those variables that are associated with the identification of the "level and type of small farmer activity to maximize small farmer welfare and productivity." In the present study we apply a different approach and methodology to the same data in order to identify measures that would enable the better design and implementation of projects that relate to small farmer development.

The Experience and the Perspective

A brief review of the past gives a perspective on

⁵Development Alternatives, Incorporated, Strategies for Small Farmer Development: An Empirical Study of Rural Development Projects (Boulder, Colo.: Westview Press, 1976).

why the recent focus on rural development has generated so much attention. The period of the forties and the fifties was marked by a widespread belief that agricultural development depended on industrial development. The industrial sector was the key sector and agriculture was expected to react to the growing urban demand for foodstuffs, raw materials, and employment.⁶ Studies in that period used one-sector models of the Harrod-Domar types. The simplistic aggregative and rigid production functions envisaged by that analytical framework precluded any payoff in the field of detailed development policies. The subsequent advent of two-sector models, while a technical improvement, continued to assign a passive role to agriculture. Growth was to evolve from the agricultural surpluses that were generated from "unlimited supplies of labor," which were to be utilized by the rest of the economy. Though operationally as inadequate as the previous one-sector models, the two-sector models contributed to one significant aspect of the development process: the interdependence among sectors. The agricultural sector released resources which the industrial sector had to absorb. The release of resources, in and of itself, and the absorption of resources, in and of itself, were not sufficient for

⁶Erik Thorbecke, ed., The Role of Agriculture in Economic Development (New York: National Bureau of Economic Research, 1969); Yujiro Hayami and Vernon W. Ruttan, Agricultural Development: An International Perspective (Baltimore: The Johns Hopkins Press, 1971), passim.

economic development to take place. What was required was that the release and absorption of capital and labor resources were to occur simultaneously. Awareness of the complementary relationship among inputs and between sectors backed by years of experimentation with seeds, fertilizers, and other inputs by foundations, universities, and the private sector ultimately brought about impressive increases in production, and expressions such as "green revolution" became commonplace.⁷

In spite of successes with agricultural production, the lot of most rural populations has remained one of abject privation. The idea of the green revolution itself was more like a "flash in the pan." Admittedly, increased productivity, in the broadest sense, was part of the rural development process, but there was a growing awareness of the absence of equity. In addition, the realization of limited success of the revolution,⁸ coupled with its high

⁷Randolph Barker, "Green Revolution," Current Affairs Bulletin 45, no. 5 (January 1970): 66-79; Lester Russell Brown, Seeds of Change: The Green Revolution in the 1970's (New York: Praeger Publishers, 1970), passim; Lyle P. Shertz, "The Green Revolution: Production and World Trade," Columbia Journal of World Business 5, no. 2 (March-April 1970): 53-59; U.S., Congress, House, Committee on Foreign Affairs, Sub-Committee on National Security Policy and Scientific Development, Proceedings: The Green Revolution, 91st Congress, 1st Session, December 1969.

⁸Walter P. Falcon, "The Green Revolution: Generations of Problems," American Journal of Agricultural Economics 52, no. 5 (December 1970): 698-710; Clifton R. Wharton, Jr., "The Green Revolution: Cornucopia or Pandora's Box?" Foreign Affairs 47, no. 3 (April 1969): 464-476; Stephen R. Lewis, Walter P. Falcon and

resource cost, has brought into focus the adoption of a small-farmer rural-development strategy that makes equity consideration an intrinsic part of the rural development process.

Studies of the recent growth of, and experience with, rural development have been largely case-specific.⁹ These have included comparative analyses with the aim of identifying small-farmer problems and how to deal with them, but these studies left many questions unanswered. In addition, the cases used in these analyses were not sufficiently standardized for successful comparative analyses. These problems were among the factors that

Carl H. Gotsch, "The Green Revolution and P.L. 480--Some Parallel Problems," Working Paper No. 3, Agricultural Price Policy and the Revolution and Development of West Pakistan (Supplemental Working Paper, Harvard University Development Advisory Service) 2 (1969): passim (mimeographed).

⁹See, for example, Uma J. Lele, The Design of Rural Development: Lessons from Africa (Baltimore: The Johns Hopkins University Press, 1975); Judith Heyer, Dunstan Ireri, and Jon Moris, Rural Development in Kenya (Nairobi: East African Publishing House, 1971); Edgar Owens and Robert Shaw, Development Reconsidered (Lexington, Mass.: Lexington Books, 1972); Arthur Franklin Raper et al, Rural Development in Action: The Comprehensive Experiment at Comilla, East Pakistan (Ithaca, N.Y.: Cornell University Press, 1970); Robert Chambers, Managing Rural Development: Ideas and Experiences from East Africa (Uppsala: Scandinavian Institute of African Studies, 1974); R. Rasmusson, "Social Studies in Kenya on Results of Decentralised Planning," Agricultural Administration 2, no. 4 (October 1975): 263-285; Ian Livingston, "Experimentation in Rural Development: Kenya's Special Rural Development Program," Agricultural Administration 3, no. 3 (July 1976): 217-235; Vincent Austin, "Approaches to Rural Development: Lessons of a Pilot Project in Nigeria," International Labour Review 114, no. 1 (July-August 1976): 61-68; John M. Cohen, "Rural Change in Ethiopia: The Chilalo Agricultural Development Unit," Economic Development & Cultural Change 22, no. 4 (July 1974): 580-614.

prompted the present study. This study is a more comprehensive, quantitative attempt to study rural development. The approach adopted, however, is inductive as well. This is so because the phenomenon of rural development suffers from the absence of well-specified and widely-accepted models of causation. Given the amorphous nature of the subject, an element of induction in the formulation of standardized variables for all the projects was adopted.

A Caveat

One general caveat must however be stated. This is with reference to the fact that rural development programs and projects, including studies like this one and the many others undertaken before it as well, have operated from the basic assumption that the farmer and his land were the principal agent. This assumption has often eliminated a substantial portion of the rural poor, the landless laborers who constitute not an insignificant group. This focus on the farmer and his land as against the landless laborer can be considered to be a defect of studies that purportedly deal with rural development without specifying the field of investigation. Admittedly, while today's glossary defines rural development with a poverty focus, it nevertheless does not connote soft programs nor welfare-type activities. Our approach shares the defect of earlier studies by concentrating on activities directed only at the small farmers with ownership over land ignoring, for the present, the landless

groups. However, there has been a growing awareness that rural development, to be meaningful, has to be all-encompassing and take into consideration the question of the landless workers. This awareness follows from the basic consideration of equity that rural development initially focussed on. Consequently, the organization of the landless peasants into service-oriented cooperatives, e.g., fishermen's cooperatives, tailors cooperatives, rickshaw pullers cooperatives, in some of the new rural development projects, is but an indication of the current attempt to rectify the initial indifference shown to the landless peasants.

Increasing equity is also the objective when, for instance, Waterston talks about "a viable model"¹⁰ for rural development with its emphasis on labor-intensive agriculture, labor using minor development works, agriculturally-oriented small-scale industry with low capital requirements, and, based on a spirit of self-reliance, implies the raising of a reasonable proportion of the resources.

The present caveat underlines the fact that this study does not take the issue of the landless laborer explicitly into consideration. The analysis is based on landed small farmers. The absence of the landless farmers from the purview of this study raises the question of whether, in all fairness, the generic terminology of rural development can be applied. As long as the objective of any

¹⁰Albert Waterston, "A Viable Model for Rural Development," Finance and Development 11, no. 4 (December 1974): 22-25.

particular project target group is explicitly recognized, rural development as a genre includes the gamut of activities that deal with the landless peasants as well.

The Data Background and Project Overview

The object of this study is to draw upon evidence developed from a diverse set of experiences with rural development in Africa and Latin America in order to examine some of the important policy and institutional issues facing national governments and donor agencies in the implementation of rural development projects. The analysis of the issues that arise has to go beyond the use of formal analytical tools if an understanding of the factors that influence the planning and the implementation at the microlevel is to be achieved.

This study covers a small set of quite varied projects of rural development in Africa and Latin America. It includes twenty-two projects in Africa and fourteen in Latin America. A description of the projects is given in tabular form in the Appendix. Table 1 gives an overview of the projects under study. The projects represent a considerable diversity in design and implementation. The study unfortunately suffers from the absence of any Asian project experience due to resource limitations. The conclusions evolving from this study are consequently provisional and have to be viewed against the background of

TABLE 1
SUMMARY DATA ON PROJECTS STUDIED

	All Projects	African Projects	Latin American Projects
Distribution of projects	36	22	14
Average number of participants, most recent year	8,136	7,809	8,649
Range	142-79,000	227,79,000	142-50,000
Average total acres	73,068 (35) ¹	95,000	35,954 (13)
Range	568-237,000	748-237,000	568-252,960
Average project length (years)	8	8	8
Range	1-23	1-23	2-23
<u>PROJECT TYPE BY AREA OF COVERAGE</u>			
Type of project area			
Local	10(28%)	8(36%)	2(14%)
Regional	19(53%)	12(55%)	7(50%)
National	7(19%)	2(9%)	5(36%)
<u>PERCENT LITERATE</u>			
Project area	35.9%	26.5%	50.6%
Range	3-90%	3-71%	30-90%
Local area	32.4%	24.3%	45.3%
Range	3-77%	3-60%	25-77%

TABLE 1--Continued

	All Projects	African Projects	Latin American Projects
<u>PERCENT OUTPUT IN CASH CROPS</u>			
Project area	52.1%	52.5%	51.4%
Range	0-90%	12-90%	0-90%
Local area	50.4%	52.5%	47.3%
Range	0-90%	5-90%	0-90%
<u>AVERAGE FARM SIZE IN ACRES UNDER CULTIVATION</u>			
Average	4.07	3.29	5.29
Range	2.5-8.0	2.5-4.9	4.0-8.0
Local areas			
Average	4.79	3.96	6.5
Range	2.2-15.0	2.2-6.0	3.0-15.0
Project participants			
Average	4.47	3.95	5.29
Range	1.8-8.0	1.8-5.9	3.0-8.0

each individual country. Past empirical rural development studies have borne the criticism of being too case specific. In contrast, this study attempts the application of standard statistical techniques with the aim of applying a more rigorous approach to the study of rural development. The study recognizes that an exhaustive approach is difficult, but the limited surveys and area visits nevertheless do make the field of investigation significantly broad.

The diversity in the projects can be gauged from the fact that the number of participants (i.e., persons involved in project activities) ranged from 142 (in the Potato Production and Seed Improvement Project in Bolivia) to 79,000 (The Kenya Tea Development Authority). In the same vein, the total average area covered by projects in Africa was considerably greater than that of projects in Latin America.

A crucial difference between the projects in the two continents is the fact that the African projects focussed more on the local level (36 percent) than did the Latin American ones (14 percent). In contrast, Latin America had more national level projects (35 percent) than had Africa (9 percent). The differences in the environment in which the projects were implemented were as pronounced. The literacy rate for Latin American projects (50.6 percent) was about double that of the African projects (26.5 percent). What was interesting, however, was the

relatively high literacy rates in the local areas in which the projects were implemented. There were two implications of this: either projects were implemented in areas which really were not the least educated nor presumably the poorest or the implementation of these projects had provided the incentive and assistance to improve the literacy rates of the project participants.

The two continents were similar with respect to the percentage of output in cash crops, both at the project and at the local level (approximately 50 percent). At the same time, across all countries the average farm size for projects was larger than the country average. In Africa, for instance, project participants cultivated about the same amount of land as other farmers in the local area, but this was more than the average, nationwide. In Latin America, on the other hand, the farm size was about equal to the national average, but less than that of the local area average. Farm size in Latin America was, however, larger than the farm sizes in Africa.

Thus, the projects being analyzed in this study were not directed at the bottom rung of the income distribution but somewhere a little higher. Given the philosophy of self-help, this emphasis was perhaps understandable. The objective of this study, then, was the identification of the factors that "explain" rural development. In most recent projects, the operational approach of self-help in terms of factors, measures, and policies concentrated on the small

and subsistence farms, the landless peasants being outside the scope of this study. This approach was a conscious one. As stated earlier, while a broad perspective of rural development includes the case of the landless farmer, the scope of this study limits it explicitly to that of the small and subsistence farmer only.

The Research Approach

This study attempts to identify the most basic factors that require attention if the gap between the overall objectives and the actual performance of rural development is to be reduced. The approach does not so much involve the ability to provide a set of definitive solutions as it does involve the provision of a method for the analysis of diverse sets of specific constraints and potentials that are encountered in rural areas. The study investigates the main factors that explain the variation in the performance of rural development projects and uses the term "projects" and "programs" interchangeably. This is not to ignore the distinction between the two but, for our purposes, both serve the objective of increasing rural welfare.

The analysis has necessitated the quantification of as many possible facets of rural development projects as were permissible within the constraints of time and money. As Arrow notes: "For empirical work, measurement while not logically indispensable, is extremely convenient; and the behavioral scientist will make many assumptions

analogous to cardinal utility, and indeed to highly specific forms of cardinal utility, simply because they are usable for empirical work."¹¹ The data were collected by DAI on the basis of a codable questionnaire with site visits to projects and are backed by case studies.

The approach involved the preparation and use of both cardinal and ordinal data. Economists have been somewhat hesitant to use ordinal data and the measurement by fiat which they often imply. This hesitancy is based on some a priori grounds of sensitivity and reliability. These objections, however, have been refuted by other economists.¹² The approach consequently attempts the use of numerical data, even if ordinal, to include the systematic consideration of social, political, and economic forces that are associated with the rural development process.

Some A Priori Hypotheses

A point to be made, however, is that some a priori hypotheses about the impact of small farmer behavior on rural development have guided the choice of variables used for the analysis. These relate, for instance, to the hypothesis that there is a positive impact of organizational

¹¹ Kenneth Arrow, "Utilities, Attitudes, Choices: A Review Note," Econometrica 26, no. 1 (January 1958): 9.

¹² Irma Adelman and Cynthia T. Morris, Society, Politics, and Economic Development (Baltimore: The Johns Hopkins Press, 1967), passim.

behavior as judged by an involvement by the farmers in project decision-making and implementation success. It also relates to the impact of self-help, and correspondingly external assistance, as judged by the commitment of resources made by the small farmers themselves, and the effect that the socioeconomic conditions conducive for success have on actual performance in project implementation. The correspondence between the hypotheses and the variables raises the problem of other variables, such as marketing policies or those summarizing pricing policies, which a priori reasoning indicates should have been included in the analysis in more explicit detail. The nexus of omitted variables consequently constitutes a major limitation of this study.

Organization of the Study

The remainder of this dissertation is organized as follows: Chapter II deals with the variables, the sample, and the methodology. It portrays the quantitative methodology utilized, the criticisms of the approach, and the tests that indicate the robustness of the results. Chapter III presents the findings of the application of the method of factor analysis; it identifies the factors which are closely associated with overall project success as well as its component parts. Proceeding a step further, it assesses the extent to which the factors identified explain the variance of some of the individual variables as well.

Chapter IV attempts a synthesis of the results in terms of operational implications for the better design of projects of rural development. It also makes a comparison of the results achieved in this study with the DAI results.

Chapter V outlines the conclusions which were reached after a comprehensive study of the data developed by the analyses. This chapter also sets forth the recommendations which were arrived at in order to provide assistance for further investigation into similar fields of research.

An Appendix follows the text of the study. All the projects used in the analysis are described in relative detail in this appendix.

CHAPTER II

THE METHODOLOGY, THE SAMPLE, AND THE VARIABLES

In very general terms, the methodology adopted is dictated by the data. The fact that there is multicollinearity among the variables that are associated with rural development requires the adoption of an approach that uses that multicollinearity to identify factors that could be construed to "explain" rural development. That is precisely what the factor analysis approach attempts. On the basis of correlations between variables, factor analysis reduces the original explanatory variables to a smaller number of factors (i.e., clusters of variables that are closely related) by a set of predetermined mathematical rules. It consequently permits the statistical analysis of the phenomena of rural development which are too complex to summarize by a single "dependent" variable.

Factor Analysis

The method¹ of factor analysis, like most statistical methods, simplifies a mass of data in order to discover their underlying regularities. These regularities may suggest the framework of a theoretical structure or provide

¹Harry H. Harman, Modern Factor Analysis, 2d ed. (Chicago: University of Chicago Press, 1967); Irma Adelman and Cynthia T. Morris, Society, Politics, and Economic Development (Baltimore: The Johns Hopkins Press, 1967); John P. Van de Geer, Introduction to Multivariate Analysis for the Social Sciences (San Francisco: W. H. Freeman & Co., 1971).

verification for some hypothesis which cannot be tested by normal regression analysis. The strength of this approach lies in the fact that it operates by using the multicollinearity present in the data which standard regression analysis cannot handle.

Factor analysis thus is a tool that assists in the simplification of the structure of the complex real world phenomena while it still retains the basic features of the original problem. It provides a more simple, compact explanation of the regularities apparent in the empirical results. The factors, or clusters of the original variables, consist of linear combinations of the initial variables and are formed from the original observed variables by the following mathematical principles: (1) those variables that are most clearly intercorrelated are combined within a single factor; (2) the variables allocated to a given factor are those that are most nearly independent of the variables allocated to the other factors; (3) the factors are derived in a manner that maximizes the percentage of the total variance of the original variables attributable to each successive factor (given the inclusion of the preceding factors); and (4) the factors are independent (uncorrelated with each other).

Factor analysis consequently partitions the whole range of variables into essentially independent subgroups, which can then be utilized to infer the extent of independence of a given variable from a given set of forces. In

other words, it breaks down the original variance of a variable into variance components associated with the variation of a set of other quantities. Thus, all variables are dependent and independent in turn.

The analysis, however, is sensitive to the number of variables included in the study. This necessitates the adoption of the criterion that every variable meets the minimal requirement of at least a single correlation coefficient that is statistically significant at the 1 percent level. The implication of this decision rule consequently points to the importance of the a priori criteria used in the initial choice of the variables.

The technique of factor analysis is sensitive to the choice of the number of factors extracted. While the decision as to the number of factors into which the variables are clustered is a more or less arbitrary one, the qualitative interpretation that evolved from such grouping is considered to be the dominating issue. Adelman and Morris,² however, suggest the use of two criteria: (1) the proportion of overall variance explained by the factors included in the rotated factor matrix be no less than a certain specified percentage chosen in part on the basis of experience with some trial runs; and (2) any factor accounting for less than a specified percentage of the

² Adelman and Morris. See also: Oscar T. Brookins, "Analysis of Variance Techniques: A Comment," Journal of Development Studies 11, no. 3 (April 1975): p. 226-229.

overall variance should not be retained provided the initial criterion is met. Criteria of this nature have been employed by psychologists using the technique and have been recommended by Harman in his standard work.³ In this study, the choice of the number of factors was checked further by testing whether the qualitative interpretation of the results was affected or not with the addition of another factor. Some statistical tests of significance to decide the extraction of factors have been propounded for large samples, but were not utilized in this study. Apart from the fact that the tests suggested were applicable only to factors extracted by the method of maximum likelihood, the sample sizes were also not considered large enough.

Causal Interpretations

The results from the use of factor analysis are subject to considerable interpretative difficulties. The technique is a form of multivariate analysis that, like all such methods, is a study of mutual association rather than that of causation. Consequently, a degree of caution is well advised in the interpretation, particularly when the solution is used to suggest a possible theory. This problem is particularly acute because for any problem in

³Harman.

an applied science there may be a number of theories that explain the phenomena in a satisfactory manner. For instance, in the field of astronomy, if we limit ourselves to the problem of describing the motions of the planets, both the Copernican and Ptolemaic theories do an equally accurate job and there is no advantage in choosing one over the other insofar as it relates to the numerical explanation of the facts of the solar system.⁴ This indeterminacy raises questions about the use of these theories as scientific tools. The same problem arises in social sciences and in the use of the factor analytic method of analysis in particular. Yet applied sciences do not depend on unique theories. Consequently, the identification of factors and their interpretation with respect to their relation to rural development are made on a provisional basis which subsequent or alternative studies will have to support.

The essential purpose⁵ of the factor analysis approach has been well expressed in the statement that

there is no search for timeless, spaceless, population-less truth in factor analysis; rather, it represents a simple straightforward problem of description in several dimensions of a definite group functioning in definite manners, and he who assumes to read more

⁴G. A. Bliss, "Mathematical Interpretations of Geometrical and Physical Phenomena," American Mathematical Monthly 40, no. 8 (October 1933): 472-480.

⁵A. C. Rayner, "The Use of Multivariate Analysis in Development Theory--A Critique of the Approach Adopted by Adelman and Morris," Quarterly Journal of Economics 84, no. 4, whole no. 337 (November 1970): 641.

remote verities into the factorial outcome is certainly doomed to disappointment.⁶

What is to be emphasized then, is the fact that the approach ultimately draws conclusions from associational relations. In the social sciences (unlike the physical sciences), cause and effect lie in the same plane and consequently a disjunctive set of features, cause and effect, provide only a partial perspective. The difficulty in drawing a line between conditions and events happening due to those conditions exacerbates the difficulty in the drawing of conclusions based on the discrete cause and effect structure. This provides an argument for drawing conclusions based on associational relations.

The Sample

As indicated above, the total sample consisted of thirty-six projects of small-farmer development in Africa and Latin America. Because of the heterogeneity of the sample, an approach was adopted that in effect tested the robustness of the results from the whole sample. This consisted in running the analysis with subsets from the total sample. The first two subsets consisted of the continental projects in Africa (twenty cases) and projects

⁶Truman L. Kelley, "Comment on Wilson and Worcester's Note on Factor Analysis," Psychometrika 5, no. 2 (June 1940): 117-120.

in Latin America (eleven cases).⁷ The second two subsets were formed along project lines. This consisted, first, in grouping projects with the same agriculture and rural development component (PARD, sixteen cases) and, second, a grouping of small-farmer development projects which had animal farming, the provision of credit, and other commercial objectives as its main rationale.

The Variables

As noted earlier, the choice of indicators or variables used in the study indicates a focus on the varied political, economic, and social conditions in the project area that bears on the design and implementation of projects of small-farmer development. While a "model" to guide the choice of variables was not used, some a priori hypotheses referred to earlier relating to project design and successful implementation did provide some basis for the choice of the variables.

This section deals with the variables which were selected for this study. There were difficulties in uncovering data that were common across all the projects and, consequently, it was thought initially that the data would be collected on case studies done by others. It was soon

⁷The absence of certain data for some variables necessitated the adoption of one of two approaches, i.e., (1) the elimination of the cases which suffered from the missing data, or (2) the elimination of the variables which had missing data in some cases. For the sake of uniformity, the former was adopted. Therefore, this analysis deals with the subset of thirty-one out of the thirty-six cases.

clear that such an approach would be fruitless. Therefore, the data were collected in the form of a questionnaire based on site visits to all the projects in Latin America and Africa. The presentation of the variables is given in some detail including, where applicable, the scoring scheme used for the ordinally-scored variables. Table 2 gives the list of the variables used in the analysis. They have been selected to capture a variety of aspects of small-farmer motivation, group action, and environmental conditions that could be considered to have an impact on project implementation.

Success Indicators

The multidimensionality of rural development made the choice of variables for measuring success a difficult undertaking. Ideally, of course, the concept of success in rural development should be equated to what we referred to earlier as "human ascent." Practical considerations, however, enforced the choice of indicators of success for which appropriate data were available. These indicators attempted to go beyond the traditional measures of project success and included both the increase in knowledge of agricultural practices and the increase in organizational capacity to raise income as well as an index of the likelihood that the benefits generated would be self-sustaining and a measure of the income generated relative to the cost undergone.

The first indicator of success used was the

TABLE 2

DESCRIPTION OF VARIABLES UTILIZED IN THE STUDY

POSSIBLE DETERMINANTS	QUANTITATIVE INDICATORS
Education	Literacy rates of project participants.
Income	Per capita income of project participants prior to start up in current prices. Percentage change in on-farm family income between the pre-project and post-project stage.
Market Integration	Percentage of output in cash crops prior to project start up.
Market Access	Percentage of projects within five kilometers of an all-weather road.
Technical Assistance	Project farmers per extension worker. Whether primary extension responsibility is crop-specific rather than general; general or combination = 1, crop specific = 2 Scale of provision of technical assistance to the small farmer.
Land Tenure Status	Percentage of project participants with reasonable security of land tenure (those with titles plus those with reasonably secure tenant contracts).
Size of Land Holding Under Cultivation	Average farm size in project area. (In Africa this included both cultivated and uncultivated land; Latin America only cultivated land).

TABLE 2--Continued

POSSIBLE DETERMINANTS	QUANTITATIVE INDICATORS
Measures of Success	<p>Ratio of total project income to total project costs.</p> <p>Agricultural Knowledge Index.</p> <p>Self-Help Index.</p> <p>Overall Success Index.</p> <p>Self-Sustaining Index.</p> <p>Replicability Index.</p>
Measures of Small-Farmer Involvement	<p>Small-farmer involvement in idea generation and design. Scale 1-5; 1 = none; 5 = high involvement.</p> <p>Small-farmer involvement in the implementation phase. Scale 1-5; dialogue = 1; dialogue, decision-making and project control = 5.</p>
Group Participation	<p>Scale of importance of group activities (organizations, associations, cooperatives) in generating small-farmer resource commitment.</p> <p>Use of local organization.</p> <p>Importance of individuals or groups to provide small-farmer input into the implementation phase. Scale 1-5; individual input = 2, group input = 5.</p>
Communication between Project and Participants	<p>Existence of an operational two-way information flow. Scale 1-5; nonexistent = 1; information flow that changed both project design and behavior of participant = 5.</p>

TABLE 2--Continued

POSSIBLE DETERMINANTS	QUANTITATIVE INDICATORS
Local Action:	
Measures of Small Farmers	Dollar value of labor resource commitment--increase or decrease of man-days on project as a result of the project x the prevailing wage rate.
Resource Commitment	Actual money resource commitment-- increase or decrease of dollar commitment in project area by project participants.
Measures of Small Farmer Resource Commitment Compared to Income	Ratio of small-farmer labor com- mitment in dollars to income per participant, most recent year.
	Ratio of small-farmer money com- mitment to income per participant
Local Action	Aggregate index of local action from four components--small- farmer involvement in idea gen- eration and design, implementa- tion, labor, and money resource commitment.
Experiences and Past History of Development Efforts in Local Area	Rating of past experience with development projects, local organization.
Provision of Incentives	Scale of size of subsidy used to get small farmers to adopt new approaches: scale 1-4; none = 1, significant = 4.

TABLE 2--Continued

POSSIBLE DETERMINANTS	QUANTITATIVE INDICATORS
External Credit	Credit availability from lending institutions not completely financed by project participants Availability of medium and/or long-term credit. Existence of savings component in project area.

relationship between the income gained by project participants and the cost of the project to the sponsors, the Income/Cost Ratio. Income was defined as the net income gained by participants after subtracting income earned through previous production on land used by the project or with labor employed in project activities. The determination of total net income of the project involved the examination of (1) the percentage increase in yield in physical output converted in dollar prices for each technological package⁸ which raised yields of previously grown crops per standard land unit and (2) the percentage of net income increases attributable to each new technological package per standard land unit. The base for the calculation

⁸A technological package is defined as the new farm practices which are required for one specific crop.

was current on-farm income in dollar prices, thus allowing a calculation of the percentage increase in on-farm family income as a result of the project. It is to be noted that all income comparisons were made for on-farm income; this was because for a number of projects, off-farm income was a key component of total farm-family income. This approach emphasizes the role of the farmer and his land as the operational unit. In the determination of total project income, the total number of people adopting a new technology was related to the estimate of income from a standard technological package for the average project participant. The benefits and income generated by adoptions outside the project area were an attribute of success largely beyond the scope of this study because of the absence of data. In only two cases in-depth research established sound estimates of income from the demonstration effect. The determination of total project costs included all project costs of services (including credit) furnished to project participants irrespective of who supplied the actual finances.

The biases in the data for this indicator were fully recognized. For instance, some "full service" projects offered all development services while others offered only a few services, thus necessarily influencing the Income/Cost Ratios. However, a more important limitation was that the income and cost figures were not discounted. This had the effect of introducing a bias raising the apparent net income of long-running projects. For the purpose of

comparison with income increases, all project costs of services (including credit) furnished to project participants and necessary for the benefits to be obtained were counted as part of total project costs, even if supplied by agencies or organizations outside the project. Credit, for instance, was assumed to be a pool, available for reuse, and consequently only the costs of "capitalizing" the pool from outside sources were charged as project costs. Only "institutional" or formal credit was charged as a project cost. If credit was used from traditional sources or if credit was made available from project participants themselves--either individually or in a locally organized and funded savings and loan association--it was not included as a project cost. Thus credit, if repayed, would allow continuing benefits over time, strengthening income benefits of older projects and significantly increasing costs for younger projects. The measure was nevertheless roughly indicative of the benefits of development resources from sources outside the local area compared with the total costs of the project. The Income/Cost Ratio ranks highly those projects with successful and sustained benefits.

The second indicator of success was the Agricultural Knowledge Index. This index was prepared on the basis of behavioral changes with respect to eleven aspects of agricultural production knowledge. These covered credit use (if repaid); participation in an effective local organization; use of fertilizer where recommended; use of improved seeds;

use of insecticides, herbicides, pesticides, treatment for animal diseases; use of substantially changed harvesting procedures or adoption of quality control measures for marketing; construction of on-farm infrastructure; maintenance of on-farm infrastructure; processing of agricultural cash crops; expansion of land under cash crop cultivation; storage of agricultural cash crops; and improved resource management (conservation, grazing, etc.). The index thus represented the acquisition and use of agricultural knowledge, specifically that information which had been production-oriented and individually acquired.

The third success indicator, the Self-Help Index, measured the extent of group participation, formal or informal, that complemented the projects' economic activities. In contrast to the agricultural knowledge index which measured production-related knowledge, this index was derived by a process of scoring six components that represented different aspects of group participation. It thus attempted to capture the efforts of political organizational effort by the underprivileged "small farmer." The six components used were: (1) creation of group decision-making capabilities which was a proxy for the ability to identify local problems and work together to overcome them; (2) mobilization of resources from the local population; (3) mobilization of resources from outside the local area which was a proxy for the ability of the local organization to draw in outside assistance; (4) provision of services by local

groups, either independently or as an intermediary for the project; (5) creation of new (non-traditional) leadership position and specializations; and (6) viability of the local organization system which included the extent of organizational activity, channels to the outside, representativeness, and continuity.

The fourth success indicator, the Self-Sustaining Index, was a little different. It attempted to capture the likelihood that project benefits would continue in the absence of subsidies. Like the first three, this indicator was a composite of three indexes: (1) recapturable project costs, which referred to the ability of the project to draw upon increased income from project participants to pay for the necessary services and supplies; (2) income increases and self-sustained benefits, defined to indicate the probability of reducing project costs without lowering the level and quality of project benefits. The difference of this measure from that of the Income/Cost Ratio has to be clarified. This measure assumed all expenses at the start of the project as sunk costs. There was no requirement to recover project costs and dealt with only the maintenance costs. The continuation of project benefits was taken from the present on to the future; and (3) domestic support for the development project, i.e., the percentage of project costs paid for by domestic sources. This was based on the assumption that a high level of support from local, regional, or national government would have a greater

potential for continued support, encouragement, and success.

The fifth success indicator was the Replicability Index an ordinal scale with scores based upon qualitative knowledge and judgments on replicability of the projects in other areas. Two issues were of prime importance in the construction of this index: (1) the uniqueness of the environment, past history of projects in the area, and the social, cultural, or economic relationships which have evolved over time; and (2) the uniqueness of project leadership and the level of motivation and managerial administrative talent demanded by the particular development approach. Constructed on a scale of one to five, the objective was the development of recommendations applicable to a wide range of locations and environments. The points to look for, therefore, were whether the projects had any unique features that hindered replication.

The five indicators of project success were aggregated into one overall success ranking by taking an unweighted average of the five.

Other Variables

Having enumerated the success measures, the variables considered likely to have a possible determining impact on success were then identified. The identification was made on an a priori basis; the relation between the variables and the indicators of success remained

undefined.

One of the main independent variables was measuring the extent of local action of the project participants. Two types of local action were considered. The first variable measured was the Small-Farmer Local Involvement in Project Decisions, both during project identification and design and during project implementation. This involvement extended from project conceptualization to implementation. Local action involved an evaluation of projects in terms of four criteria: dialogue in which project staff would discuss problems and exchange ideas with the small farmers (more to the advantage of the project staff); decision-making that ranged from indirect influence on project staff to direct control of project operations through local intermediaries on key aspects of the project; technical contributions that included any involvement beyond unskilled labor and technical specialities as extensionists, researchers, etc.; and resource commitment in the form of man days of labor, materials, and cost. Projects were ordinarily ranked on a five-step scale in terms of idea generation and project design on the one hand and in terms of involvement at the implementation phase on the other. The rankings were initially made within continents and later integrated.

The second aspect of the interpretation of local action was that of Small-Farmer Resource Commitment, both in the form of increased labor and in cash commitment. The use

of this variable was aimed at determining the man-days of labor required by the new technology in comparison with the old. Only man-days of unpaid labor were included. Those projects which paid for farm-family labor commitments or provided excessive credit which was not needed for cash inputs, and could be diverted to farm-family labor payments, were penalized. This was, however, relatively infrequent and occurred in only three projects. The general practice for institutional credit was to cover only increased cash costs of new agricultural practices, not including family labor.

The aspect of small-farmer resource commitment in the form of cash covered three components: out-of-pocket cash and the interest paid on credit represented fairly clear increased resource commitment by small farmers, the problem of input costs paid out of credit was more complex. Increased production was calculated for each project. Projects that had no institutional credit available were assumed to have the increased cash costs met out-of-pocket or from traditional or local lending sources. Consistency requirements over all projects required the application of an opportunity cost of 30 percent interest for the period of the growing season in the particular area.

Institutional credit, on the other hand, had a bunching problem. A project with a great deal of money on a smaller number of participants could score heavily in

resource commitment in contrast to one with a larger number of participants. Consequently, a manipulation was devised to adjust for this problem.

The four components of local action (involvement/design, involvement/implementation, labor, and money/commitment) were standardized and aggregated to produce the Overall Local Action variable for this study.

Ancillary to the concept of local action, the relative importance of groups or individuals both in the generation of small-farmer resource commitment and in the provision of small-farmer inputs into the implementation phase was also calculated. A scoring scheme of 1 to 5 was used: 1 representing totally individual inputs, and 5 representing all group inputs. This represented the a priori reasoning that rural development was to be based, not on the fragmented individualist approach of the past but on a communal and concerted approach that could take advantage of all possible scale economies that existed in the rural sector. Towards this objective of effective group participation, the importance of communication between the project authorities and the participants was considered of crucial importance. The determinant of communication was thus quantified in a scoring scheme that identified the existence of an operational two-way information flow. The scale ranged from 1 to 5, where 1 represented no information flow, that is, a lack of an operational mechanism that facilitated the flow of information, to 5, which implied

that information flow had succeeded in changing both the design of the project and the behavior of the project participants. This approach operated under the assumption that the farmers themselves were the best judges of their own requirements. A good number of rural development projects have failed⁹ because of a superimposition of what the project authorities thought were good for the farmers instead of responding to the farmers' needs. This variable was aimed to cover the extent of the provision of such communication channels.

Along with these efforts of local action, group participation, and communication, the impact of the socio-economic conditions in the project area on the success of attempts at rural development has not been very clear, if for no other reason than, as has been charged by some, that rural development projects have often been undertaken in areas where the socioeconomic conditions in the project area were seen to be better than in areas outside the project area. A priori reasoning would anticipate a close association between success and the socioeconomic conditions of the project area. Towards that end, the quantitative indicator of education, the literacy rate, was considered conducive for success and was interpreted as the percentage of participants in the project area who had the ability to

⁹A good example of the failure of such an approach is the Community Development Program in India. See Developing Rural India: Plan and Practice, ed., John W. Mellor et al (Ithaca: Cornell University Press, 1968).

read a basic farm manual. The income of the small farmer was considered another important condition associated with success. Income was interpreted in two ways: first, the per capita income of the project participants before the start of the project, and, second, the percentage change in on-farm family income between the preproject and post-project stage.

One element of a host of policies that generate the motivational force that brings about change is that which deals with the question of land distribution and tenurial policies. Pricing and marketing policies contribute as well to bringing about the change which is the objective of rural development. Yet the question of land policies, particularly where acute inequity in the distribution of land rights exists, becomes important, and the full potential of programs directed at the small farmers is not realized simply by targeting programs towards distinct identifiable groups and devising temporary tenurial arrangements. Redistribution of land rights appears not only as an integral part of rural development strategy, but as the pivotal factor in any approach.

Studies of rural development now give this aspect of the size of distribution of land holdings considerable importance.¹⁰ For our purposes, the two variables that

¹⁰See Solon L. Barraclough, "Agricultural Policy and Land Reform," Journal of Political Economy 78, no. 4, part II (July-August 1970): 906-947; William R. Cline, Economic Consequences of a Land Reform in Brazil (Amsterdam: North Holland Publishing Co., 1970); M. J. Sternberg, "Agrarian Reform and Employment with Special Reference to Latin

attempted to reflect this concept were the size of land holdings under cultivation, measured by the average farm size in the project area, and their land tenure status, interpreted by the percentage of project participants with a reasonable security of land tenure (that is, those with titles and those with reasonably secure tenant contracts).

The question of marketing of output is critical¹¹ to the entire agricultural development process for, without the prospect of being able to sell his products, the farmer would be unlikely to invest in the acquisition of modern agricultural technology. For our purposes, two variables attempted to reflect the impact of this concept. A well-integrated market, interpreted by the percentage of output in cash crops prior to project start up would be responsive to price signals and consequently adapt easily to changing circumstances. More importantly, it implied that the farmer

America," International Labour Review 95, nos. 1-2 (January-February 1967): 1-26; Dale W. Adams, "The Economics of Land Reform," Food Research Institute Studies in Agricultural Economics, Trade & Development 12, no. 2 (1973): 133-138.

¹¹Yujiro Hayami and Vernon W. Ruttan, Agricultural Development: An International Perspective (Baltimore: The Johns Hopkins Press, 1971), p. 264; Uma J. Lele, "The Traders of Shopapur," in Developing Rural India: Plan and Practice, ed. John W. Mellor et al (Ithaca: Cornell University Press, 1968), pp. 238-239; Richard H. Holton, "Marketing Structure and Economic Development," Quarterly Journal of Economics 67, no. 3 (August 1953): 344-361; J. C. Abbott, "The Role of Marketing in the Development of Backward Agricultural Economies," Journal of Farm Economics 44, no. 2 (May 1962): 349-362; William O. Jones, "Agricultural Marketing and Economic Development," Paper no. 13 of Cornell Workshop on Some Emerging Issues Accompanying Recent Breakthrough in Food Products, March 30-April 3, 1970, Cornell University. (Mimeographed.)

produced, not for consumption, but for marketing, and, therefore, would be relatively aware of increasing incomes more so than in a situation where the farmer produced primarily for his own consumption. Almost as a necessary adjunct to the variable of market integration was the variable of market accessibility which was interpreted by the extent of projects within five kilometres of an all-weather road.

Two other variables of quite different dimensions were also used in this analysis. The first was the variable that attempted to grasp the experiences and past history of development efforts in the local area. This was interpreted from a scale and an average score tabulated of the project participants' perception of similar development projects, government organizations, community, and other organizations. The rationale behind this was an effort to grasp the environmental conditions in terms of the project participants' predilection towards organized attempts at development. The other variable was aimed to cover the indicator, provision of incentives, interpreted by the size of subsidy used to get small farmers to adopt new approaches. This was ranked on a 1 to 4 scale, 1 indicating the provision of no incentive and 4 indicating the provision of significant incentive. This variable related itself to the other variables that described the socioeconomic conditions in the project area in an inverse way. On the other hand, it also reflected the intensity with which project authorities attempted to

provide the necessary inputs to the farmers. This particular aspect of effort on the part of the project authorities was also reflected in the indicator of technical assistance which was interpreted by the three variables, project farmers per extension worker, scale of provision of technical assistance to the small farmers, and whether the primary extension responsibility was general or crop specific.

The Question of the Omitted Variables

The results of this analysis are limited by the variables included. While an attempt was made to cover as wide a range as possible, a comprehensive approach to the problem would have required a more explicit analysis of some of the determinants. For instance, two aspects in the area of land policies are important but have been omitted from the analysis because of data unavailability. The first of these is effectiveness of collectivization, particularly where the average holding is small and fragmented, and the second is the disincentive of the uncertainty of land rights. The effectiveness of collectivization bears critically on the issue of organization--who will do what, when, how, and at what wage rate. While collectivization has been controversial in terms of its impact on productivity, as the experience from some of the Ujamaa villages in Tanzania appear to indicate,¹² the desirability of eliminating

¹²Uma J. Lele, "Designing Rural Development Programs:

risk and uncertainty over tenurial rights and their effect on output is more clearcut. In addition, while tenurial-rights establishment is a policy decision, the execution of that new arrangement, the form of its organization and its consequent impact need to be analyzed. All of these aspects are outside the scope of our variables.

The other aspect of considerable importance to rural development that has been omitted almost totally from this analysis is the question of the pricing policies of the government.¹³ Irrespective of the extent of administrative decision-making in the projects, the price system still carries the signals that ultimately determine the projects' success or failure. A pricing policy that does not considerably turn the terms of trade against agriculture is imperative for success. This rather crucial aspect of rural development, which is necessary for a comprehensive analysis, has been omitted from the variables utilized in this study.

Lessons from Past Experiences in Africa," Economic Development and Cultural Change 24, no. 2 (January 1976): 294.

¹³See, for example, Raj Krishna, "Agricultural Price Policy and Economic Development," in Agricultural Development and Economic Growth, ed., Herman McDowell Southworth and Bruce F. Johnston (Ithaca: Cornell University Press, 1966); Randolph Barker and Yujiro Hayami, "Price Support versus Input Subsidy for Food Self-Sufficiency in Developing Countries," American Journal of Agricultural Economics 58, no. 4, part I (November 1976): 617-628; John Thomas Cummings, "The Supply Responsiveness of Indian Farmers in Post-Independence Period: Major Cereal and Cash Crops," Indian Journal of Agricultural Economics 30, no. 1 (January-March 1975): 25-40.

In a somewhat similar pattern as the variables representing land policies, the variables reflecting the impact of marketing in rural development policies touch only the surface of the problem. To an extent, this was because marketing was not a problem in the cases studied. This reflected the successful handling of the problem rather than the unimportance of marketing. On the other hand, the variables do not reflect the complicated question of the mixture of pricing and marketing policies together.¹⁴ For example, the availability of alternative markets, backed in some cases by government price supports, allowed the small farmers, individually or in groups, to overcome any problems. In six projects in Gambia, Mexico, and Ecuador, where no marketing services were provided, there was an effective government price support which eliminated any potential marketing problems. In Ghana, Nigeria, and Kenya the establishment of a floor on local sales dealt effectively with the marketing problem.

The purpose of this section has been to discuss some of the influences that have not been explicitly included in the analysis. The likely impact of including these omitted variables is, however, clear, as all the references seem to indicate. Inclusion of these variables would go towards strengthening the results derived from this

¹⁴Peter F. Bell and Janet Tai, "Markets, Middlemen and Technology: Agricultural Supply Response in the Dualistic Economies of Southeast Asia," Malayan Economic Review 14, no. 1 (April 1969): 29-47.

analysis, as seen from other studies.

In summary, this chapter attempts to describe the method of factor analysis, the variables utilized, and the objective in the use of such a method. In a situation where the development practitioner is faced with a large number of socioeconomic variables all related to the "success" of rural development, but in which none is considered to be of more importance to success than any other, this methodology becomes appropriate. It provides weights so that an index, that distinguishes among the different projects with the maximum variance, may be devised to make that preliminary choice of at least groups of variables that are more closely related than are others. The method thus could be used either as a ranking device or as a descriptive device or, what is more relevant, as a tool for further analysis. The variables utilized in this study reflected a priori reasonings based partly on previous studies and partly on the availability and feasibility of the collection of particular data.

CHAPTER III

THE FACTOR ANALYSIS

The results of the factor analysis of the thirty-one rural development projects are presented in Table 3. For the purpose of interpretation each variable was assigned to the factor in which it had the largest weight. The interpretation of the factors in terms of the groupings of variables in the factor matrix, however, was made with some caution. This was because the technique of factor analysis is sensitive both to the nature and the number of variables used in the analysis. Since a variable had to associate in some factor, the possibility of low factor loadings increased as the number of variables were increased the number of factors being held constant. To minimize the adverse effects of including irrelevant variables, any variable whose highest simple correlation coefficient was not statistically significant at the 1 percent level was excluded from this analysis.¹ Another approach that could have been utilized to reduce the likelihood of random associations was the low maximum loading criterion. This implies the discarding of variables whose highest loading

¹ Irma Adelman and Cynthia T. Morris, Society, Politics, and Economic Development (Baltimore: The Johns Hopkins Press, 1967), pp. 143-146.

FACTOR ANALYSIS OF THIRTY-ONE RURAL DEVELOPMENT PROJECTS

Variables	F1	F2	F3	F4	h^2
Agricultural Knowledge Index	.68	.49	.33	.05	.81
Self-Help Index (Group Participation)	.84	.15	.11	.10	.75
Self-Sustaining Index	.74	.29	.05	.22	.68
Scale of Small-Farmer Involvement in Idea Evolution and Project Design	.64	.31	.44	.06	.70
Scale of Development in Decision-Making and Implementation	.90	.20	.11	.11	.87
Existence of an Operational Two-Way Information Flow	.67	.17	.14	.36	.63
Scale of Size of Subsidy to Get Small Farmers to Adopt New Approaches	.34	.05	.05	.05	.12
Scale of Importance of Group Activity in Generating Resource Commitment	.68	.09	.12	.26	.55
Relative Importance of Individuals or Groups to Provide Small-Farmer Input into Implementation Phase	.70	.09	.27	.11	.58
Overall Success Index	.83	.45	.12	.14	.92
Overall Local Action Index	.92	.05	.08	.16	.88

TABLE 3--Continued

Variable	F1	F2	F3	F4	h^2
Income/Cost Ratio	.19	.39	.22	.17	.27
Most Recent Year Project Cost per Participant	.11	.65	.09	.03	.44
Percentage Change Between Pre- and Post-Project On-Farm Family Income	.15	.91	.03	.10	.86
Value of Money Resource Commitment	.21	.91	.12	.15	.91
Value of Money Resource Commitment Divided by the Average Between Pre- and Post-Project Income	.27	.73	.10	.20	.66
Replicability Index	.07	.02	.40	.04	.17
Percentage of Project Output in Cash Crop Prior to Project Start	.18	.28	.36	.05	.24
Per Capita Income of Project Participants	.05	.01	.22	.10	.06
Scale of Provision of Technical Assistance to the Small Farmer	.21	.29	.37	.14	.28
Percentage of Project Participants with Reasonable Security Over Land	.07	.10	.17	.10	.05
Labor Value Divided by the Average Pre- and Post-Project Income	.33	.34	.78	.02	.83
Value of Labor Resource Commitment	.38	.37	.85	.03	

TABLE 3--Continued

Variable	F1	F2	F3	F4	h^2
Literacy Rates of Project Participants	.02	.09	.07	.75	.58
Market Access: Percentage of Projects Within 5 km of All- Weather Road	.13	.02	.22	.49	.31
Average Farm Size in Project	.07	.01	.29	.52	.36
Past Experience with Development Projects	.00	.16	.25	.44	.28
Cumulative Proportion of Variance Explained	25%	38%	49%	55%	

fell below a certain specified value. A low maximal loading could occur either if the variable had very little affinity with any of the factors in the study or if the variable was closely associated with more than one factor. In such cases the criteria of simplicity and consistency in interpretation were utilized to make the allocation of the variable into a particular factor. Inductive analysis was also utilized with regard to the difficulty in determining the appropriate number of factors. The absence of any decision rule necessitated the application of ad hoc procedures. For example, the same analysis was performed with three and five factors in order to observe changes in the pattern of the results. It was observed that the four-factor spread fit the data best.

That the inclusion of variables with low loadings should create problems in analyses in which the choice of variables was guided by a body of commonly-held a priori propositions itself appeared a little surprising. This, however, merely reflected the fact that the political, economic, and social forces guiding rural development in particular contexts may not be systematically important for the range of projects studied here.

The results for a full sample of projects are presented in Table 3.

The First Factor (Full Sample)

The first factor with a clustering of eleven variables explained nearly 69 percent of the variance of the

overall success index of rural development. The clustering of the three main indices of project success in this factor, together with the overall index of success and extent of local action on the projects, was understandable since they were defined as interrelated components of success. Yet the clustering of the other variables in this factor gave it its distinctive feature. The cluster was composed of the following variables, all of which were positively related to each other: agricultural knowledge index; self-help index; self-sustaining index; scale of small-farmer involvement in idea evolution and design; scale of small-farmer involvement in decision-making and implementation; existence of an operational two-way information flow; scale of size of subsidy to get small farmers to adopt new approaches; scale of importance of group activities (organizations, associations, cooperatives) in generating small-farmer resource commitment; relative importance of individuals or groups to provide small-farmer input into the implementation phase; the overall success index; and the overall local action index.

The variables in this factor underlined the inter-related aspects of group action and effort. This factor encompassed not only the mobilization of communal action in the form of explicit approaches in planning and implementation, but included the facilitative impact of communication as well in the mobilization of the organization that brought forth that communal action. Within a more general framework, the importance of the local organizational and institutional

structure of small-farmer participation in implementing rural development was emphasized.²

The factor taken as a whole consequently represented an index of group action and effort, with the individual factor loadings acting as weights. Given the initial choice of variables measuring strength of communal approaches in rural development, the positive relationship is not unexpected between the small-farmer involvement in idea evolution, design and implementation, and the overall index of success. Rural development projects, unlike the atomistic, individualistic farmer-based service-providing approach of the past, have now adopted a communal approach based on group motivation and group action. The impact of the group approach was apparent in (what was more important) the positive relationship between the overall success index and the scale of importance of group activity in generating both resource commitment and the provision of small-farmer inputs into the implementation phase. The associations in this factor thus suggest that the greater and more successful the mobilization of group action in all its aspects,

² Harvey M. Choldin, "An Organizational Analysis of Rural Development Projects at Comilla, East Pakistan," Economic Development and Cultural Change 20, no. 4 (January 1972): 671-690; Peter J. Bertocci, "Patterns of Social Organization in Rural East Pakistan" in Bengal: East & West, ed. Alexander Lipski, Michigan State University, Asian Studies Center, Occasional Paper No. 13, South Asia Series (East Lansing: Michigan State University, 1970), pp. 105-137; A. O. Ellman, "The Introduction of Agricultural Innovations through Cooperative Farming: A brief outline of Tanzania's Policies," East African Journal of Rural Development 3, no. 1 (1971): 1-15.

including decision-making and resource mobilization, the greater was its chances for success. The results also suggest that threading together this mobilization of communal action with success was the existence of an operational two-way information flow that provided the crucial vehicle for the transmission of the necessary signals. The relationship between the flow of communication and success was also positive. A better flow of communication increased the exchange of ideas between the farmers and the executing authorities to the greater success of the effort at development.³

The Second Factor (Full Sample)

The collection of variables in the second factor, explaining about 20 percent of the variance of the overall success index of rural development, reflected the underlying aspect of financial effort and income generation that related to one dimension of success in rural development. The group of variables that were clustered together included: income/cost ratio, which was a component of success; the overall project resource commitment, defined as the most recent-year project cost per participant; the percentage change between the pre- and post-project on-farm family income; the value of actual money resource

³David K. Leonard, "Communication and Deconcentration" in Development Administration: The Kenyan Experience, ed. Goran Hyden et al (Nairobi: Oxford University Press, 1970).

commitment defined to evaluate the extent of money committed with respect to increase in income derived from the project.

The second factor thus reflected the significant impact that growth and the continuation of income streams had on efforts by rural communities to improve their own positions. The participation in the planning process of the rural people through raising and risking significant quantities of their own resources improved the quality and reliability of rural investment choices. As an adjunct to self-help through group participation, self-help in the form of financial commitment ensured an involvement and participation on the part of the small farmers.⁴ The relative importance of this factor was also indicated by the fact that it explained nearly 20 percent of the variance of the overall success index. This relationship implied the fact that as more income was generated, more money was committed to the project which in turn improved project success.

This factor thus reflected the size of the income and financial effort that was required to circumvent the resource endowment constraints faced by the small farmers. The factor underscored the large commitment necessary not only by the small farmers but also by the implementing authority.

⁴Robert D. Stevens, "Three Rural Development Models for Small-Farm Agricultural Areas in Low-Income Nations," Journal of Developing Areas 8, no. 3 (April 1974): 409-442.

A point that was of interest was the fact that while this factor reflected the association between income/cost ratio and the size of resource commitment, the question of credit, which on a priori grounds would have been expected to influence closely all of the above aspects included in this factor, did not appear to have been important. The credit variables appeared to have been distributed with small loadings across all four factors. This appeared to indicate that credit was not a constraint for these projects. In addition, there appeared to be almost no relationship, as represented by the correlation coefficient, between external credit, the related variables of success, the increase in family income, and local action. The conclusion from this aspect of credit was somewhat equivocal. Credit was not a constraint in the projects, neither could it be clearly concluded that it was unimportant.⁵

The Third Factor (Full Sample)

The collection of variables in the third factor

⁵Development Alternatives, Incorporated, Strategies for Small Farmer Development: An Empirical Study of Rural Development Projects (Boulder, Colo.: Westview Press, 1976), pp. 253-292; International Bank for Reconstruction and Development, Operations Evaluation Department, Agricultural Credit Programs, Report No. 1357 (Washington, D.C.: November 1976); Uma J. Lele, "Role of Credit and Marketing Functions in Agricultural Development," a paper presented at the International Economic Association Conference on The Place of Agriculture in the Development of Underdeveloped Countries, Bad Godesberg, West Germany, August 26-September 4, 1972.

reflected the impact that certain characteristics of the project farmers had on the labor effort made by the participants. The cluster of variables in this factor included the replicability index; the labor value resource committed; the labor value divided by the average pre- and post-project income; the percentage of project participants output in cash crops representing market involvement; per capita income of project participants; scale of small-farmer provision of technical assistance; and percentage of project participants with reasonable security over land. The factor thus reflected a positive relation between higher per capita income, a more secure tenurial status, and a greater market involvement and the value of labor resources committed by the participants and, more specifically, the value of labor resource committed with respect to the increase in income generated by the project. This factor thus defines a separate dimension for the effort made by the project participants and the variables that were associated with the commitment of labor resources in rural development.

The factor explained an insignificant percentage of the variance of the overall index of success. This apparent lack of importance may be because all the projects were characterized by fairly low income levels and market involvement. In this case, then, the set of projects may have been below the threshold where variations in these characteristics might have an impact on overall success. However, observing the individual success indices, it

appeared that the factor explained nearly 11 percent of one dimension of success, the agricultural knowledge index. Higher per capita income, a more secure tenurial status, and a greater market involvement represented the individual position of the farmers, all of which were positively related to the value of labor resource committed by the participants and reflected in the agricultural knowledge index. This success index represented the acquisition of agricultural knowledge which was also individually acquired by the farmers.

While the characteristics of the project participants, in terms of per capita income, tenurial security, and market involvement provide conditions for a greater labor commitment by the farmers, policies that affect those characteristics through, for instance, a change in land policy or the institution of marketing boards or changes in the policies of the marketing boards are also important but have not been considered explicitly in the analysis.⁶

The Fourth Factor (Full Sample)

The collection of variables in the fourth factor

⁶Doreen Warriner, "Results of Land Reform in Asian and Latin American Countries," Food Research Institute Studies in Agricultural Economics, Trade & Development 12, no. 2 (1973): 115-133; William R. Cline, Economic Consequences of a Land Reform in Brazil (Amsterdam: North Holland Publishing Co., 1970); William R. Cline, "Interrelationships between Agricultural Strategy and Income Distribution," Food Research Institute Studies in Agricultural Economics, Trade & Development 12, no. 2 (1973): 139-157.

reflect the influence of some of the other key characteristics of the project area rather than the characteristics of project effort which the first three factors indicated. The association of variables that reflected the education, accessibility, size distribution of land holdings, and the historical experience in development efforts, specified selected aspects of the setting in which the rural development projects were undertaken. The explanatory power of this factor for the overall success index was, however, insignificant. This pattern of association between the variables indicated the somewhat surprising result that, within the range of variations represented by the sample, these characteristics of the project area had very little impact on project success.

This result would seem, consequently, to negate the suggestion of implementing projects where such basic conditions for success, as a literate and accessible population, were more favorable. The results emphasized that once a minimum level of economic well being was attained, it becomes possible to initiate rural development activities without attempting to create the conditions for success or attempting to construct the infrastructure for eventual implementation of rural development projects.

Summary of Full Sample Results

The factor analysis identified three main dimensions which appeared to be positively associated with success in implementing rural development projects. These were the

factors of (1) local and group participation, communication, and community action; (2) the extent of income generated and financial resource committed; and, of much less importance, (3) the impact of some of the characteristics of project participants on the labor resource commitment of the farmers. The fourth dimension indicated that, within the range given by the sample, certain key characteristics of the project area had very little impact on the success of rural development projects. The first two factors together explained nearly 89 percent of the variance of the overall success index. The two other factors representing selected characteristics of the project area and participants did not explain a significant amount of the variance of the overall success index. Nevertheless, project characteristics that could be relatively easily manipulated through land, pricing, and marketing reforms were related through the extent of labor resource effort to one of the criteria of success in rural development. The final factor composed of the variables identifying certain characteristics of the project area was significant by reason of its lack of relationship with success. This finding was significant given the prevailing view that improvements of the type represented by the fourth factor are essential for success in rural development. The last factor showed that success was not in any way contingent on improvements of these types, unless minimum levels of achievement were reached. The latter point is suggested by the fact that all the project

areas represented by the sample were below a certain minimum level with respect to the variables clustered in this factor.

Results from Subsets

As discussed earlier in the chapter on methodology, the clustering of the variables in a particular factor is sensitive to both the number of factors and the number of variables. This sensitivity motivated us to run subsets of projects to test the robustness of the results from the whole sample. Three subsets were created from the whole sample. The first subset, PARD, of sixteen projects, was created out of projects which had a distinct agricultural and rural development component. The second subset, SFD, of eight projects, was created with projects which had, instead of agricultural production as its rationale, the provision of credit, or animal raising, or some other commercial success as its main objective. The division of the whole sample into these subsets was made primarily on an ad hoc basis. The factor matrices for both subsets are presented in Tables 4 and 5.

To take the PARD subset first, the cluster of variables in the first factor explained nearly 61 percent of the variance of the overall success index of rural development, and was almost identical to that of the analysis for the whole sample. Group participation, organization, and effort was the main influence associated with rural

TABLE 4
 PARD: FACTOR ANALYSIS OF SIXTEEN
 RURAL DEVELOPMENT PROJECTS

Variable	F1	F2	F3	F4	h^2
Agricultural Knowledge Index	.68	-.51	.01	.45	.93
Self-Help Index	.91	-.25	-.02	.08	.89
Self-Sustaining Index	.77	-.45	.22	.30	.93
Scale of Small-Farmer Involvement in Idea Evolution and Project Design	.61	.23	-.13	.05	.44
Scale of Involvement in Decision-Making and Implementation	.85	.32	-.20	-.08	.87
Existence of an Operational Two-Way Information Flow	.59	.24	-.55	.14	.73
Scale of Importance of Group Activity in Generating Resource Commitment	.59	-.12	.53	.00	.64
Relative Importance of Individuals or Groups to Provide Small-Farmer Input into the Implementation Phase	.84	-.11	-.03	-.31	.81
Overall Success Index	.78	-.44	.03	.32	.90
Overall Local Action Index	.91	.18	-.07	.02	.87

TABLE 4--Continued

Variable	F1	F2	F3	F4	h^2
Replicability Index	.11	.06	.28	.83	.78
Percentage of Project Output in Cash Crops Prior to Project Start	-.15	-.43	.12	.49	.46
Per Capita Income of Project Participants	.22	-.01	-.27	.68	.58
Scale of Size of Subsidy Used to Get Small Farmers to Adopt New Approaches	.04	-.08	-.13	-.70	.51
Percentage of Project Participants with Reasonable Security Over Land	-.02	-.14	.01	-.12	.03
Cumulative Proportion of Variance Explained	26%	46%	57%	65%	

TABLE 4--Continued

Variable	F1	F2	F3	F4	h^2
Replicability Index	.11	.06	.28	.83	.78
Percentage of Project Output in Cash Crops Prior to Project Start	-.15	-.43	.12	.49	.46
Per Capita Income of Project Participants	.22	-.01	-.27	.68	.58
Scale of Size of Subsidy Used to Get Small Farmers to Adopt New Approaches	.04	-.08	-.13	-.70	.51
Percentage of Project Participants with Reasonable Security Over Land	-.02	-.14	.01	-.12	.03
Cumulative Proportion of Variance Explained	26%	46%	57%	65%	

TABLE 5
 SFD: FACTOR ANALYSIS OF EIGHT
 RURAL DEVELOPMENT PROJECTS

Variable	F1	F2	F3	F4	h^2
Agricultural Knowledge Index	-.77	.51	-.30	-.07	.95
Self-Help Index	-.92	-.05	-.20	.04	.89
Self-Sustaining Index	-.66	-.15	-.44	.37	.79
Scale of Small-Farmer Involvement in Idea Evolution and Project Design	-.89	.00	-.12	.35	.93
Scale of Involvement in Decision-Making and Implementation	-.90	.31	-.16	.18	.96
Existence of an Operational Two-Way Information Flow	-.82	.24	-.32	.01	.83
Scale of Size of Subsidy to Get Small Farmers to Adopt New Approaches	.66	-.60	-.04	.30	.89
Scale of Importance of Group Activity in Generating Resource Commitment	-.95	-.19	-.22	.17	1.00
Relative Importance of Individuals or Groups to Provide Small-Farmer Input into Implementation Phase	-.90	-.32	-.08	-.14	.94
Overall Success Index	-.71	.44	-.30	.28	.87
Overall Local Action Index	-.64	.51	-.55	.12	.99
Literacy Rates of Project Participants	.67	.11	-.50	-.46	.92

TABLE 5--Continued

Variable	F1	F2	F3	F4	h ²
Market Access: Percentage of Projects 5 km of All-Weather Road	.82	.06	.09	.15	.71
Scale of Provision of Provision of Technical Assistance to Small Farmer	-.77	.03	.64	-.09	1.00
Income/Cost Ratio	.26	.85	-.02	-.03	.79
Value of Money Resource Commitment Divided by Average Pre- and Post-Project Income	-.10	.92	-.29	-.26	1.00
Most Recent Year Project Cost Per Participant	.35	-.64	-.16	.47	.78
Percentage Change Between Pre- and Post-Project On-Farm Family Income	-.10	.86	-.01	.25	.81
Value of Money Resource Commitment	-.07	.91	-.16	.21	.90
Labor Value Divided by Average Pre- and Post-Project Income	-.21	.25	-.01	-.05	.94
Per Capita Income of Project Participants	.16	-.02	.86	.18	.80
Past Experience with Development Projects	-.34	-.10	-.81	-.34	.90
Value of Labor Resource Commitment	-.29	.23	-.89	-.19	.97

TABLE 5--Continued

Variable	F1	F2	F3	F4	h^2
Replicability Index	.32	-.09	-.20	-.88	.92
Percentage of Project Output in Cash Crops Prior to Project Start	.26	-.28	-.08	-.71	.66
Percentage of Project Participants with Reasonable Security Over Land	.07	.04	.12	.80	.66
Average Farm Size in Project	-.47	-.15	-.29	-.84	1.00
Cumulative Proportion of Variance Explained	42%	60%	79%	88%	

development success in this subset. The greater the involvement of the small farmer, not individually but as a group, in resource generation, idea evolution, design and implementation, the greater was its success. Similar to the cluster of variables in the analysis for the whole sample there was also the positive relation between the existence of an operational two-way flow of information and success.

The second factor in the PARD subset was a cluster of variables that reflected the effort made by the project participants both in the money resource committed and the value of labor resources committed. This factor explained about 19 percent of the variance in the overall success index. The direction of relationship was similar to that of the whole sample study. The greater the effort made by the farmers through the collective commitment of money resources, the greater was its success. What was of interest however was the negative relationship among the variables in the factor between the value of labor resource committed and that of the money resource committed. This was not as startling as it initially appeared. Given the collection of projects in this subset there was apparently a substitution effect in the form of the effort committed by the farmers, but the essential positive relation between resource commitment and success remained the overriding phenomenon.

The third factor in the PARD subset was similar to the fourth factor in the whole sample. The factor consisted

of a collection of variables that described selected characteristics of the project area in contrast to that of project effort. And, similarly to the analysis of the whole sample, the factor explained an insignificant percentage of variance of the overall success index.

The fourth factor of the PARD subset reflected a residual collection of project characteristics which, however, explained nearly 10 percent of the variance of the overall success index. This was somewhat unexpected but could be attributed to the particular collection of projects used in this subset. The collection of projects with a dominant agricultural rural development bias and the exclusion of projects with a dominating credit, livestock farming, or a commercial objective, suggested a more pronounced impact of characteristics such as literacy and market accessibility on the overall success index than appeared on the full sample.

In somewhat the same pattern as the PARD subset and the whole sample analysis, the SFD subset consisting of projects with a distinct credit, or livestock, or some other commercial objective, gave a similar spread of factors as in the two previous analyses. The cluster of variables in the four factors was more or less similar to the total sample as well as to the PARD analyses. There was some random association of variables but the essential structure of the first two factors of group participation and financial effort remained the same. The first two factors cumulatively explained nearly 69 percent of the variance of the overall

success index similar to the whole sample analysis.

The cluster of variables in the third factor, reflecting the impact of project characteristics on labor resource commitment, however, explained a surprising 9 percent of the variance of the overall success index. The cluster of variables for the fourth factor reflecting characteristics of the project area also explained nearly 8 percent of the overall success index for the SFD subset of projects. The larger variance of overall success explained by the last two factors reflecting the characteristics of the project area however has to be viewed with some caution. The number of observations were too few (eight projects for four factors) for the results to have a great validity.

The similarity of the factors in the whole sample and the subsets indicates the robustness of the results. It also suggests that the relationships of the variables were linear as assumed by the technique of factor analysis. Performing the analysis with other subsets has also yielded essentially similar results. Among projects of small-farmer development in Africa and Latin America, success appeared to be associated with group participation, income/financial effort in and of itself and the labor effort it generated and the dissociation of success with project characteristics. These were the main findings that were shown to be robust by this test.

Limitations of the Analysis

The limitations of this analysis can be perceived

at two levels. The first is in the use of the technique of factor analysis itself. The most acute criticism in the adoption of this approach has been the labelling of the method as a form of "correlation hunting." The absence of a well-articulated theory before the application of an empirical analysis is perhaps the most serious indictment against such analysis. Without question, this criticism has to be accepted in principle. Yet the evidence of association or correlation or lack thereof may be suggestive of possible theoretical relationships which inductive theorizing can subsequently expand.

The second set of limitations is with reference to what could best be described generally as data problems. This includes, for instance, the specification of the variables on an a priori basis. The effect of the omitted variables on this analysis cannot be determined. On the other hand, the strength of the analysis is based on the strength of the variables utilized and to that extent the choice of variables predetermines the results. In addition, the smallness of the sample itself is an important constraint to the strength of the conclusions derived from this analysis. The absence of projects from Asia, particularly from the countries of the Indian subcontinent, Taiwan, the Philippine Islands, and Indonesia, where considerable success in rural development has been achieved, also provides a serious limitation to the results. A further aspect of limitation that this analysis suffers from is the

cross-section approach that it utilizes. The effect of time on the variables is also unclear. If history does provide a learning experience, one could hypothesize a stronger relationship between success and the factors identified. This section on limitations has been intended to provide some caution as to the results.

Conclusion

The technique of factor analysis was utilized because it was the most appropriate method for the analysis of the effort identified as rural development--where strong collinearity among the variables negated the application of any other statistical methods. This factor analysis identified two main dimensions which appeared to be associated with success in implementing rural development. The two main factors were group participation, and income generation and financial resource commitment. A third dimension, though not as significantly associated with the overall success index, nevertheless reflected the impact that certain characteristics of the project area had on labor resource commitment.

The factor of group participation explained a significantly large proportion of the variance of the overall success index of rural development. The factor indicated a positive relationship between a communal approach to development and success. The communal approach implied an involvement on the part of the farmers, both in the planning

and in the implementation of rural development projects. Basic to the involvement of the farmers and success in rural development was the role of the flow of information. The greater the ease with which information was exchanged between the farmer and the executing authorities the greater the success in implementation.

The factor of financial effort was the next most important dimension of success in that it explained nearly 20 percent of the variance of the overall success index. The greater the effort made by the small farmers in terms of financial resource commitment, the greater was its success in rural development. Given the fact that there was a positive relationship between income generated by the project and financial resource commitment, questions arose regarding both the size and the structure of the project components.

The third factor dealt with the impact on success of certain characteristics of the project area through the extent of labor resource committed. The extent of land security provided stability to the project farmers. The commitment to the project objective, in terms of the value of labor resources, was increased. The extent of market orientation in terms of the percentage of cash crops in the farmers' output had a similar positive relationship with the value of labor resource committed and consequently with success. Although the variables did not include land reform, pricing, and marketing, these aspects of development were implicit in the analysis. The positive relationship between

some surrogates of these aspects and the success of rural development holds implications for the planning and the implementation of future projects. Attempts at land reform and appropriate pricing and marketing measures would only increase the success in rural development.

The fourth factor provided the somewhat unexpected inference that socioeconomic characteristics of the project area did not have an impact on the success of rural development for projects in areas having achieved a certain minimum level of literacy and market involvement.

The subsample results provide a test for the robustness of the full-sample result. Two subsets were analyzed and the results were broadly similar to the whole sample analysis.

CHAPTER IV

THE POLICY IMPLICATIONS OF THE RESULTS

The systematic association of the factors of group participation and financial resource commitment with success in the implementation of rural development projects has practical implications for the future planning of rural development projects. The impact of the weaker relationship of selected project characteristics with its impact on labor resource commitment and consequently success is also of significant interest. The purpose of this chapter is to discuss the consistency of these results with rural development experience in other parts of the world and to explore their policy implications.

Group Action and Organization

The emergence of the cluster of variables representing local group or community action, including the aspect of communication, as the most important factor in all three sets of results, was indicative of its importance in implementing projects of rural development. This activity of group action implied an involvement and ability on the part of the small farmers to make their own decisions. Contributing to the ability to take collective actions was the significant impact of communications both among the participating farmers and between the farmers and the implementing agency.

An example of how the violation of these two components of group action brought the Community Development Program in India to a moribund state is appropriate.

The Community Development Program in India, involving the organization of blocks of about one hundred villages each into an administrative structure, was aimed at affecting the educational, social, and economic goals of plans for rural upliftment.¹ Operating from an assumption that the backwardness of farmers' attitudes was the main obstacle to development, the program functioned as a transmission belt downward, and the cultivators were given little voice. Output consequently was little affected by this program and the reasons ascribable were varied. It was partly due to the diversity of its goals, partly because its structure was largely divorced from existing experiences in agricultural extension and research organization, and partly because of poorly-trained personnel. The Indian example confirms the view that improvements in technology alone are likely to affect agricultural output only marginally when unaccompanied by local participation. What was missing and required was an involvement of the farmers into the process of development itself.

In the case of the Israeli agricultural effort, it was seen that by using a new technique the agricultural

¹ John Williams Mellor, et al, eds., Developing Rural India: Plan and Practice (Ithaca: Cornell University Press, 1968), passim.

production could be raised to a new but stagnant level, and it was the scientific method with its constant examination and improvement of methods that held the key to success,² The emphasis in this effort was on the communication of information. What was lacking was not knowledge of techniques but channels of communication between the government promoting these new techniques and the backward traditional farmer³ which the Israelis were able to provide.

The organization for group action in rural development is not new. Societies have frequently launched programs of community development (or community action) with the assumption that the community is a "service center," all members of a community having relatively equal access to and influence over these institutions.⁴ In point of fact, however, the distinctive feature of the control of any major economic institutions and the consequent differential access to these institutions depends on the relationship of those who are in control. Every major economic event represents a distribution of benefits and losses that occur,

²Raanan Weitz and Avshalom Rokach, Agricultural Development: Planning and Implementation. An Israeli Case Study (New York: Frederick A. Praeger, Inc., 1968), passim.

³David K. Leonard, "Communication and Deconcentration," in Development Administration: The Kenyan Experience, ed. Goran Hyden et al (Nairobi: Oxford University Press, 1970).

⁴Todd Gitlin, "Local Pluralism as Theory and Ideology," in Recent Sociology, no. 1, ed. Hans Peter Dreitzel (London: The Macmillan Co., 1969), pp. 62-87.

not randomly, but within a framework of power relations.⁵ The economics of supply and demand in general is more often than not transformed into the politics of power and defiance.⁶ Community action is thus contingent on the awareness of how institutional arrangements function. This emphasizes the importance of the human factor, particularly now that modern agriculture requires investment in modern technologies demanding skilled labor. The human factor in turn operates more successfully within an agricultural structure that emphasizes a constant observation and with a flow of communication between farmers as well as between farmers and the government executing agents.

The factor of group action thus translates into organization⁷ of the implementing machinery, with the farmers as the main catalysts of action. That the rural people could indeed manipulate their surroundings and organize to take advantage of what was once viewed as the insurmountable laws of nature have, of course, been recognized by every country and every society at some point in time. Ghana made its

⁵Irving Leonard Markovitz, "Bureaucratic Development and Economic Growth," Journal of Modern African Studies 14, no. 2 (June 1976): 183-200.

⁶Emeka Onwubuemeli, "Agriculture, the Theory of Economic Development, and the Zande Scheme," Journal of Modern African Studies 12, no. 4 (December 1974): 569-587.

⁷Peter J. Bertocci, "Patterns of Social Organization in Rural East Pakistan," in Bengal: East & West, Michigan State University, Asian Studies Center, Occasional Paper No. 13, South Asia Series, ed. Alexander Lipski (East Lansing; Michigan State University, 1970), pp. 105-137.

first attempt at rural mobilization when the first mass education drives began, and community development organizers introduced the "old" notion of "self-help" in which the rural people were induced to think and articulate their "self-needs."⁸ The Chinese, now considered the most successful in mobilizing and revitalizing the rural economy, did it with fanshen.⁹ During the 1950s the basic organizational unit in the Chinese countryside was enlarged successively from individual peasant households, to mutual aid teams (at first temporary and later permanent), to production teams (formerly elementary agricultural producers co-operatives, APC), to production brigades (for advanced APC's), and, finally, to communes.¹⁰ Group action translated into rural organization must be considered within its historical and social context with a full awareness of the political implication and the pressure groups involved in it.¹¹

⁸R. Cranford Pratt, "The Administration of Economic Planning in a Newly Independent State," Journal of Commonwealth Political Studies (Leicester) 5, no. 1 (March 1967): 38-59.

⁹William Hinton, Fanshen--A Documentary of Revolution in a Chinese Village (New York: Vantage Press, 1966).

¹⁰John G. Gurley, "Rural Development in China 1949-72 and the Lessons To Be Learned from It," World Development 3, no. 7-8 (July-August 1975): 455-471.

¹¹Pratt, 38-59.

The Political and Bureaucratic
Aspects of Organization

Our analysis contained no indicators of national or regional government policies. However, the major weight in our results of local participation suggests the importance of government policies favorable to participation.

The political aspect in local organization for group action is imperative since it deals with how the small farmers with whatever limited means at their disposal organize themselves to make the government "deliver." The politics involved, in what after all is an inter-sectoral allocation of scarce resources for any development plan, is a subject that has rarely received a straight-forward appraisal. There have been few instances where explicit political commitment to help the lot of the small farmers has gone beyond the fringes of salutary pronouncements or expectations, hopes, and desires. One example where it has, is the Israelis who operate from the explicit acceptance of the criterion of providing each farmer with an income and a standard of living equivalent to his counterpart in urban areas.¹² That criterion becomes the basis for deciding on the allotment of land and water, on crops, on price supports, as well as on providing equivalent services, i.e., medical, education, and equivalent social opportunities. There has been some awareness on the part of some of the developing countries that the political commitment of the

¹²Weitz and Rokach.

government provides the groundwork for group action, but it still leaves a lot to be desired.

Assuming a modicum of political commitment to alleviate the condition of the poor farmers, an extremely important adjunct to the political organization of the small farmer is the bureaucratic structure which determines the communication flow. This problem is particularly acute since rural development involves the entire spectrum of development activities and need not follow defined lines of functional government. However, the practical implications of the facts of group action raises two fundamental tenets that require closer inspection. They are decentralization and popular participation.

According to studies of rural development, bureaucratic decentralization presents two problem angles that have to be eased--the first, the intraministerial loss of power from the center to the field or project area; and, second, the short circuiting of the lines of authority of the other ministries by the executing officer in charge of rural development.¹³ An additional, more general problem suggested by case studies is the fact that popular participation is anathema for any bureaucracy.

While the first two can certainly be recognized, the third appears a little misdirected. An organization of

¹³Obaidullah Khan and J. Tomas Hexner, A Turning Point: Poverty Oriented Rural Development and the U. N. System. Report to the Agriculture Coordination Committee of the United Nations, January 1976 (New York: United Nations, 1976).

any kind represents a form of bureaucracy; it is in the formation of that bureaucracy that a possible alienation might occur and, given the tendency of human beings to organize in some form or other, there does not seem to be anything basically inconsistent among organization, the bureaucracy it implies, and popular participation. Yet there have been too many instances of how an indifferent bureaucracy can make reform a nullity. The failure of land reform in India, for instance, was caused, in large part, by the negative attitude of officials at the state, district, and village levels who made no effort to enforce enacted land reform legislation. Thus while concentrated power can convert the decrees, only expanded power can convert the decrees into reality. And, while peasant participation may not be necessary to pass legislation, it is necessary to implement legislation.¹⁴ The major points in this factor representing group participation were the provision of a community focal point for economic and social activity and for the evolution of the political and bureaucratic form so that people could enter modern economic life.

Studies by specialists in community efforts suggest that group action, to ensure efficiency in implementation of projects, necessitates not only the organization of rural communities to interact with the delivery agencies in the establishment of priorities, but also the ability to provide

¹⁴Samuel P. Huntington, Political Order in Changing Societies (New Haven: Yale University Press, 1968).

the political resources for incentives in the efficient bureaucratic performance on innovations.¹⁵

The disconsonant structure, where relatively well-educated and affluent technicians provide services for the poor and largely illiterate rural farmers, and, consequently, with little chance of success, brings into focus the problem of organization in a different way. The problem is the search for a different approach, a different rationale, and one that need not perhaps depend on the "market" structure in the form of a direct work-reward relationship. One approach of this form is that of the Chinese development of hsiao-tsu.¹⁶ This is based on the organizational ideal of basing social change and economic development on the unified labor, energy, and determination of every member of the population rather than on the differential contributions of various strata in society. It operates from the concept that each individual, feeling that his own ideas and contribution are of value to society, will work harder and will improve his skills, not in order simply to earn more or avoid

¹⁵Solon Barraclough, "Farmers' Organizations in Planning and Implementing Rural Development," in Rural Development in a Changing World, ed. Raanan Weitz (Cambridge: MIT Press, 1971 pp. 304-390; John F. Speight, "Community Development Theory and Practice: A Machiavellian Perspective," Rural Sociology 38, no. 4 (Winter 1973): 477-490.

¹⁶Martin King Whyte, Small Groups and Political Rituals in China (Berkeley: University of California Press, 1974).

losing his job, but in order to earn the respect of those around him. Admittedly, this approach depends significantly on the political structure that is necessary for its support--as was evident particularly in the atrophy of the hsiao-tsu network during the cultural revolution, and, to that extent, is of limited relevance for the rest of the developing world.¹⁷ But elements of it certainly are of significance, not for blind emulation, but for examination and a possible adaptation within the sociological and economic constraints of a particular country. Hsiao-tsu succeeded in providing a forum for bringing problems into the open and resolving them. Even though individuals might not feel caught in the contagious spirit of enthusiasm which the system demands, the hsiao-tsu network does insure that they become aware of official goals and demands, and that the farmers will not have any difficulty in expressing or finding support for opposition, but that they will have even more difficulty in avoiding compliance--thus ensuring exchange and communication between the farmers and the executing agent.

The presence of an organized setting for communication, which hsiao-tsu implies, could be seen as an important factor in the Harambee Self-Help projects in Kenya.¹⁸ The

¹⁷Gurley.

¹⁸R. Rasmusson, "Social Emphasis of Peoples Priorities in Rural Development: Case Studies in Kenya on Results of Decentralised Planning," Agricultural Administration 2, no. 4 (October 1975): 263-284.

baraza and the smaller meetings and discussions in groups appeared as the two forms of communication of equal importance. The effectiveness of the baraza as a form for dialogue between representatives of the government and the people, however, depended on the level at which it was held. The sub-chiefs' baraza, for instance, was effective, but the divisional/district level baraza was not. In any case, what this indicates is the importance of a structure that facilitated communication.

In isolation, the approach of the Chinese seems of dubious relevance for the developing countries operating under an entirely different political, social, and economic environment. Yet, the essence of the approach has already been attempted in a number of projects. The significance of group action translated into organization, which implicitly ensures efficient communication, is now generally acknowledged.

Financial Commitment and the Question of Project Components

The association of variables reflecting the income/financial effort (of the project participants) with success was the second most important factor in this analysis. The adjunct to self-help in the form of group participation appeared to be self-help in the form of financial commitment on the part of the small farmers. The implication of this factor in terms of the design of rural development projects was significant as the small farmers

raised and risked substantial quantities of their own resources. This approach followed from the generally accepted belief, voiced for instance by Waterston, that rural development, to succeed in any measurable form, must not be exclusively welfare oriented.

The income generated by a project (defined as the increased physical output generated) and the financial commitment by participants are closely associated with success. This positive relationship between the size of commitment and the relative success suggests economies of scale in project design. The implication of this in the design of project components is crucial. This design becomes more important as our results do not suggest any ideal mix of components that make up a rural or small-farmer development project. However, they underline the importance of interactions between the different elements that constitute a project.

The importance of financial resource commitment by project participants to the success of rural development suggests the practical importance that participant investments in increasing agricultural output, and thereby income, have on success. The choice of components inducing greater participant output increases the net benefits from the project as a whole, as much as it does in financial efforts. Thus the design of a project within the framework of a long-run development strategy should stress income returns from direct investments that increase output as well as the more

in the impact of these project characteristics on success. The range of the projects in the sample and the focus on small farmers as opposed to the landless peasants provide the grounds to believe that conditions may not be as intractable to improve the small farmers' condition as they had at first appeared. The small farmers' directly productive activities, even in the relatively backward areas of the sample of countries in which the projects under study are situated, have as equal a chance of success as they have in the more advanced areas.

The policy implication of the limited effect of the characteristics of projects summarized in Factors 3 and 4 on success are not unequivocal. The cluster of variables in the factor indicates some positive effect that market accessibility and conditions of tenure may have on the value of labor resources committed (one dimension of success). These characteristics can be manipulated through government measures affecting land, pricing, and marketing. The extent to which such manipulations can be effective and consequently influence success is determined by characteristics of government institutions not represented by our variables.

Conclusion

Our discussion of the policy implications of the results from the factor analysis reveals that measures to increase local participation are critical for small-farmer development. The association of the factor representing

group participation with success has strong implications for the politics of organization. The politics of organization, in turn, includes the forces of decentralization and effective communication. Other studies in the field suggest that political commitment of national governments is an essential precondition for rural development programs to increase local participation. It is only with a determined national commitment to improve the condition of the rural small farmers that success in rural development can be achieved. While our study does not consider the landless peasants, political commitment is all the more necessary to rural development efforts that include the landless peasants within its purview. Thus, the most important policy implication of the first factor in our results remains the need for governmental effort to organize the farmers into group activities affecting decision-making.

The association of project generation of increased physical output and participant financial effort with success suggests that the extent to which farmers raise and risk considerable amounts of their own resources depends upon their ability to increase agricultural output and thereby continue to commit financial resources. In terms of project design, the financial effort factor emphasizes the importance of directly productive investments to increase physical output which, in turn, generates financial commitment and thus success. Other studies, however, point to the possibility of generating financial effort on the part of the

diffused qualitative returns that evolve from social investments.

The question that is raised is with reference to the approach to be adopted in identifying the project mix. Given the positive relation between participant efforts to increase agricultural output, participant financial effort, and project success, a question of interest is: Should one expect a financial or output effort on the part of the project participants from greater investments in social inputs such as education, water supply, or health services, etc.: or should the income returns from the project determine the social inputs that might be affordable? The results of our analysis cast no light on this. However, one can explore the question briefly on the basis of the results of other studies in this field

For the range of the projects in our sample we have seen the absence of a relationship between a factor which includes literacy, access to markets, etc., and success. These results suggest the unimportance of social forces at the level of development represented by our sample. They also suggest the desirability of focusing on measures which directly increase physical output and measures which induce participants to commit more of their resources to the project. In contrast, a survey made in 1973, covering five Harambee (self-help) projects chosen at random in each of sixty-five districts all over Kenya, showed that the provision of local "say" in decentralized programs appeared to result in

considerably more social components (or projects) than economic ones. This survey apparently reflected the belief of the participants that socially-oriented projects were the best means of long-run improvement of their economic situation. The Kenyan example showed further that, once the investments in social infrastructure in the form of education, health, water facilities, etc., were made, the farmers appeared to generate a considerably large amount of their own resources for investment in directly productive activities.

The Kenyan example might reflect a somewhat special case of the impact of social influences or the importance of influences not explicitly represented by the variables in our study. The response of farmers to social investments may also depend on the particular country and, more specifically, on the specific situation in the project area.

Thus, while the association between increased agricultural output generated by the project, participant financial effort, and success suggest a project framework that concentrates primarily in investments to increase output, some other studies emphasize the fact that social investments may favorably affect the directly productive activities.

Impact of Selected Characteristics of Project Area

The lack of any systematic association between some variables that describe selected characteristics of the project area and project success in our results holds out the implication of the operation of a possible threshold effect

participants with social investments only where the participants are at sufficiently high levels of income.

As to the effect of selected socioeconomic characteristics in our third and fourth factors such as literacy, tenure conditions, access to markets, and market orientation, their lack of impact on success is somewhat surprising. Contrary to our expectations that education and accessibility of markets would positively affect success, we found no significant direct association with success. However, some aspects of the project area relating to land security and market orientation appear to have an indirect impact on success through their effect in inducing a greater labor resource commitment by the project participants.

These results do not mean that the characteristics in Factors 3 and 4 are not important for rural development in general, particularly since our sample included projects at very low levels of development. They suggest, rather, a threshold in the impact that some of these socioeconomic characteristics of the project area have on success. Within the range of the projects represented in this study, therefore, rural development efforts stressing local participation have a chance of success in spite of patently adverse circumstances.

The factor analysis which was performed with different subgroups of the total sample of projects reinforces the findings for the full sample and thus indicates the robustness of the results.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The factor analysis of the characteristics of rural development projects in Africa and Latin America suggested, in the first place, a strong association of success in rural development with the active participation in planning, design, and implementation by the small farmers. The second significant factor represented the impact of output generation by project activities and the financial effort made by the farmers themselves on project success. The third factor which represented selected characteristics of the project area such as land tenure and market accessibility suggested their indirect impact on success by increasing labor resource committed to the project. And, finally, the fourth factor provided the somewhat unexpected result that some rather important socioeconomic characteristics of the project area and people, such as literacy rate and market accessibility, were not systematically associated with success of rural development projects. The results of the factor analysis for varying subsets of the projects were quite similar, indicating considerable robustness of the results.

The key implication that follows from the results is that behind all successful programs is the involvement of the farmers, as groups, in decision-making, in project

initiation, in design, and in implementation. Other studies suggest that, in bringing about this involvement, a method of systematic decentralization and the delegation of responsibility to the farmers through a process that ensures effective communication is required to achieve success. The active participation of the farmers in this group effort requires a political commitment by the administrative and bureaucratic structure that nurtures the organizational effort of the farmers.

The results of the factor analysis are consistent with experiences reported in other studies of rural development. For example, in the Kenyan baraza as well as the Chinese hsiao-tsu the emphasis was primarily on the direct involvement of the farmers based on a structure that ensured communication, not only among the farmers, but between the farmers and the administration.

The major policy implication of the second factor is in the impact on success of the financial effort made by the project participants. The close relationship between the generation of increases in physical output and financial effort by participants indicates that, within the range of development efforts represented by the sample, there is a necessity for generating increased physical output, and thus income, so that a greater financial contribution will be forthcoming.

The third factor identified a weak association between characteristics of the project area such as literacy,

accessibility, market orientation, etc., and success; these associations indicate that, within the range of projects represented by the sample, some generally presumed preconditions for development were not important for success. The weakness of these relationships suggested the fruitfulness of more direct productive efforts by small farmers.

The recommendations based on the results from this study are directed at the planning representative or project director in the field. The recommendations are consistent with the experiences of rural development efforts in a wide range of environments.

The prime recommendation is for an active involvement on the part of the small farmers. This involvement should be sought in the form of organized group activity in the decision-making structure. It should be made apparent to the farmers that they themselves are the agents of change, and that, while external assistance contributes to the overcoming of the initial financial constraints, its role should be primarily catalytic. It is reasonable to suppose that access to external resources and/or power over resources contributes to an awareness on the part of the farmers that they can indeed improve their own position. Other studies of rural development suggest that a reservoir of creativity exists among the poor rural farmers. Hence, increased participation in day-to-day decision-making in all phases of local economic and social activities will provide them with an awareness of the possibilities for improving their

positions and a willingness to channel their energy into increasing their productivity.

Studies of the politics of participation suggest that, to be able to mobilize the farmers, the project manager (or executing agency) should identify the local power structure within the civil administration and the traditional lines of authority. A perception of the dynamics of these entities will enable him to organize the farmers into groups and to interface the groups with the existing administrative hierarchy to achieve a better functioning of rural development plans. A related problem for the project manager is how far he should apply external resources to improve local planning and implementation. The appropriate amount of such organizational assistance will vary with respect to each individual case or project. At the same time, there are of course limitations to the extent that the project manager can dictate the local bureaucratic structure. Thus, what is clear from both our results and other studies is that project assistance should actively involve local participants in all stages of project formulation and implementation. Our results do not, however, indicate the specific nature of the required institutions.

The literature on participation in decision-making indicates the importance of channels for the exchange of information. The operation of recognized mediums for communication has been an important influence in rural development projects and the organizational structure has to make this a

"linchpin" in the establishment of small-farmer group activity. Thus, communication must flow both among the participants as well as between the executing agency or project planners and the participants.

Other studies of rural development suggest the desirability of organizing the farmers into action-oriented groups not by replacing existing systems but by working as far as possible within existing administrative frameworks. New administrative structures should be the exception and not the rule. Where the creation of new project authorities is desirable, they should generate within the existing structure by rationalizing traditional lines of authority.

The recommendations that are generated from the second factor stressing the positive relationship between direct output generation, local financial effort, and success should be treated somewhat cautiously. Other studies have suggested that success in rural development through output generation and a consequent increase in financial effort was itself based on improvements in social infrastructure, e.g., schools, health centers, etc., in other words, improvement in the quality of life. Since our sample and variables are limited, they do not provide a sufficient basis for validating this proposition.

The policy implications of the third and fourth factors expressing the lack of association between literacy, market accessibility, and market orientation with success are unclear. Given the possibility of the operation of

thresholds in the impact of these influences on success, the suggestion is made that project success for small-farmer development can be achieved even under what are patently adverse circumstances.

The study suffers from several limitations. The first limitation is in the adoption of the method of factor analysis. This method is often criticized as an approach without theoretical rationale. The second limitation is in the omission of certain variables from those utilized in the study. The omitted variables may be important, for instance variables that deal with pricing and/or marketing.

A third important limitation is the omission, already discussed, of the consideration of landless laborers. While our somewhat partial approach leaves something to be desired, it nevertheless also throws light on the impact of a considerable range of influences that are crucial for rural development success.

The most important conclusion suggested by the results indicates that, for small-farmer development projects, in both design and implementation, success depends significantly on the effectiveness of local participation in rural development. The result is consistent with other studies of rural development which stress the importance of the flow of information--information that identifies the constraints of the local environment imposed on the small farmers, information on alternative ways to provide the needed services for solving technological problems, and on information that

facilitates the setting up of an organizational framework for the farmers to react among themselves and with the executing agency. At the same time, a necessary adjunct to these information flows is a flexibility on the part of project implementers. This flexibility is important in the organization and extension methods as well as in research into particular problem areas.

Finally, rural development is significantly a question of commitment by both planners and local participants. There are no shortcuts. Efforts can be made to ease it but attempts to hurry it by imposing planning schemes from above are unlikely to end in success.

APPENDIX

LIST OF SMALL-FARMER/RURAL DEVELOPMENT PROJECTS IN STUDY

Country (Acronym)	Project	Type	Sponsor
AFRICA			
<u>GAMBIA</u>			
CHIRPP	Chinese Irrigated Rice Production	Crop-specific	Taiwan
IBRD/ADP	IBRD Agricultural Development Project, MacCarthy Island Division	Irrigated Rice Production, with Component for designing an integrated agricultural development project	IBRD; government of The Gambia
MFC	Mixed Farming Centers (nationwide)	Farmer training and extension follow-up with the use of para-professional workers	Government of The Gambia
MVS	Mixed Vegetable Scheme, Western Division	Introduction of onion production and the creation of women's farmer associations	Government of The Gambia Cooperative Union; Freedom from Hunger
CGPI	Confectionary Groundnut Package Deal, Western Division	Crop-specific innovations through the cooperative movement	Gambia Cooperative Union; government of The Gambia

Country (Acronym)	Project	Type	Sponsor
<u>GHANA</u>			
CSC	Christian Service Committee's Agricultural Program, Northern and Upper Regions	Introduction of simple technological innovations through agricultural stations	Christian Council of Gambia; World Council of Churches
CGAP	Ghanaian-German Agricultural Project, Northern and Upper Regions	Fertilizer distribution evolving into an effort to help small farmers	West German Government; government of Ghana
GG/FAO	Ghanaian Government/FAC Fertilizer Use Project, Volta Region	Cooperative development, and the introduction of improved maize seed and fertilizer use	UNDP/FAO; government of Ghana
BIRIWA	Biriwa Development Project, Cape Coast Area	Development of fishing village through commercial and community development activities	West German Government, government of Ghana
DENU	Denu Shallots Project, Denu District, Volta Region	Short-term and medium-term credit for expanding shallot production	Local Cooperative; Agricultural Development Bank of Ghana
<u>KENYA</u>			
VIHIGA	Vihiga Special Rural Development Program, Western Province	Integrated rural development program	USAID; government of Kenya

Country (Acronym)	Project	Type	Sponsor
TETU	Tetu Special Rural Development Program, Central Province	Experimental agricultural extension project to reach less-progressive smallholders	University of Nairobi; government of Kenya
LIRHEMBE	Lirhembe Multi-Service Cooperative, Western Province	Agricultural and social development project in a small geographic area initiated by local Member of Parliament	NOVIB, Dutch charity organization; government of Kenya
KTDA	Kenya Tea Development Authority; Highland areas	Government-controlled commercial effort to expand production by small farmers	Government of Kenya; British Commonwealth Development Corporation; IBRD/IDA
MRTC	Maasai Rural Training Centre Kajiado District	Improve cattle production practices, training of Maasai, and establishment of commercial activities	National Christian Council of Kenya
<u>LESHOTO</u>			
THABA BOSIU	Thaba Bosiu Rural Development Project, Thaba Bosiu District	Intensive effort to improve agricultural production, rural infrastructure, and conservation practice	IBRD/IDA; USAID; government of Lesotho

Country (Acronym)	Project	Type	Sponsor
LERIBE	Leribe Pilot Agricultural Scheme, Leribe District	Experimental project to develop technological packages and approaches to improve agricultural production for replication in other parts of Lesotho	UNDP/FAC; government of Lesotho
<u>NIGERIA</u>			
ARMDP	Abeokuta Rice and Maize Development Project, Western State	Introduction of improved inputs, including mechanization, through farmer groups	Western State and Federal Ministry of Agriculture; FAO and USAID in earlier stages
NTC	Nigerian Tobacco Company, Western State	Introduction of flue-curing through Farm Family Units	Nigerian Tobacco Company British American Tobacco Company
ZTDP	Zaria Tomato Production Project, North Central State	Irrigated tomato production, introduced through farmer associations for commercial processing	North Central State Government; FAC; Cadbury, Ltd.
TIV BAMS	Tiv "Bams" and Farmers' Association, Benue Plateau State	Indigenous small-farmer savings/credit program	None

Country (Acronym)	Project	Type	Sponsor
UBOMA	Uboma, East Central State	Integrated rural development project	Shell-BP Nigeria; East Central State Government
<u>LATIN AMERICA</u>			
<u>BOLIVIA</u>	DESEC, Center for Social and Economic Development (nationwide)	Promotion of rural base institutions and rural assistance agencies which sponsor income-generating projects by small farmers	MISERIOR (German Catholic Bishops); OXFAM; other private European donors; Inter-American Foundation
ASAR	ASAR/ARADO Potato Production and Seed Improvement Project, Cochabamba	Promotion of yield-increasing potato technology on a risk-sharing basis with organized small farmers	Association of Artisan and Rural Services (ASAR), of DESEC; MISERIOR
NCDS	National Community Development Service (NCDS) (nationwide)	Community development in the rural sector	National Community Development Service; government of Bolivia; USAID
<u>COLOMBIA</u>			
CAQUEZA	Caqueza Project, ICA Rural Development, Eastern Cundinamarca	Pilot project to adapt high-yield crop technology to small farm requirements	Institute of Colombian Agriculture (ICA), USAID

<u>Country (Acronym)</u>	<u>Project</u>	<u>Type</u>	<u>Sponsor</u>
CAUCA	ICA Rural Development Project for Northern Cauca, Valle de Cauca	Pilot project to adapt high-yield crop technology to small farm requirements	Institute of Colombian Agriculture (ICA); USAID
FUTURO	Futuro Para La Ninez (Futures for children), Antioquia	Community development program promoting self-help projects which benefit children	Futuro Para la Ninez government of Colombia (Ministry of Health)
<u>ECUADOR</u>			
PPEA	Agricultural Enterprise Promotion Program (PPEA), Guayas Basin	Production and infrastructure development credit for agricultural cooperatives	Financial Funds Department Central Bank; USAID; National Development Bank (BNF)
FECOAC	FECOAC Directed Agricultural Production Credit (nationwide)	Directed agricultural production credit to small farmers	FECOAC; Cooperative Bank; USAID
<u>MEXICO</u>			
PUEBLA	Plan Puebla, State of Puebla	Pilot project to adapt modern corn technology to small-farm requirements in dryland regions	International Maize and Wheat Improvement Center (CIMMYT); Rockefeller Foundation

<u>Country (Acronym)</u>	<u>Project</u>	<u>Type</u>	<u>Sponsor</u>
PLAN MAIZE	Plan Maize, State of Mexico	High-yield corn production credit program	State of Mexico, Department of Agriculture and Livestock Development (DAGEM)
<u>PARAGUAY</u>			
CAH	CAH Associations of Agricultural Credit Users	Technical assistance, credit, and group marketing project with organized small farmers	Caja Agraria de Habilitacion (CAH); government of Paraguay
CREDICOOP	CREDICOOP Directed Agricultural Production Credit	Directed agricultural production credit to small farmers	CREDICOOP; CUNA; USAID
<u>PERU</u>			
VICOS	The Community of Vicos, Department of Ancash	Community development and rural modernization via democratic institution-building in an indigenous society	Cornell University; Peruvian Indigenous Institute
ORDEZA	ORDEZA/RDD, Rural Enterprise Development, Huaraz Department of Ancash	Planning, construction, and financing of income-generating projects in rural communities	Rural Development Division of the Peruvian Earthquake Relief Agency; government of Peru, USAID

BIBLIOGRAPHY

- Abbott, J. C. "The Role of Marketing in the Development of Backward Agricultural Economies." Journal of Farm Economics 44, no. 2 (May 1962): 349-362.
- Adams, Dale W. "The Economics of Land Reform." Food Research Institute Studies in Agricultural Economics, Trade & Development 12, no. 2 (1973): 133-138.
- Adelman, Irma and Morris, Cynthia T. Society, Politics, and Economic Development. Baltimore: The Johns Hopkins Press, 1967.
- Arrow, Kenneth J. "Utilities, Attitudes, Choices: A Review Note." Econometrica 26, no. 1 (January 1956): 1-23.
- Austin, Vincent. "Approaches to Rural Development: Lessons of a Pilot Project in Nigeria." International Labour Review 114, no. 1 (July-August 1976): 61-68.
- Barker, Randolph. "Green Revolution." Current Affairs Bulletin 45, no. 5 (January 26, 1970): 66-79.
- Barker, Randolph and Hayami, Yujiro. "Price Support versus Input Subsidy for Food Self-Sufficiency in Developing Countries." American Journal of Agricultural Economics 58, no. 4, part I (November 1976): 617-628.
- Barlow, Colin. "The Socio-Economic Response to Different Institutional Structures." In Opportunity and Response, Case Studies in Economic Development, pp. 193-202. Edited by Trude Scarlett Epstein and David H. Penny. New York: Humanities Press, 1973.
- Barraclough, Solon L. "Agricultural Policy and Land Reform." Journal of Political Economy 78, no. 4, part II (July-August 1970): 906-947.
- Barraclough, Solon L. "Farmers' Organizations in Planning and Implementing Rural Development." In Rural Development in a Changing World, pp. 364-390. Edited by Raanan Weitz. Cambridge, Mass.: MIT Press, 1971.
- Bell, Peter F. and Tai, Janet. "Markets, Middlemen and Technology: Agricultural Supply Response in the Dualistic Economies of Southeast Asia." Malayan Economic Review 14, no. 1 (April 1969): 29-47.

- Bertocci, Peter J. "Patterns of Social Organization in Rural East Pakistan." In Bengal: East & West, pp. 105-137. Michigan State University, Asian Studies Center. Occasional Paper No. 13, South Asia Series. Edited by A. Lipski. East Lansing: Michigan State University, 1970.
- Bliss, G. A. "Mathematical Interpretations of Geometrical and Physical Phenomena." American Mathematical Monthly 40, no. 8 (October 1933): 472-480.
- Brookins, Oscar T. "Analysis of Variance Techniques: A Comment." Journal of Development Studies 11, no. 3 (April 1975): 226-229.
- Brown, Lester Russell. Seeds of Change: The Green Revolution and Development in the 1970's. New York: Praeger Publishers, 1970.
- Bunting, Arthur Hugh, ed. Change in Agriculture. London: Gerald Duckworth & Co., Ltd., 1970.
- Chambers, Robert. Managing Rural Development: Ideas and Experience from East Africa. Uppsala: Scandinavian Institute of African Studies, 1974.
- Choldin, Harvey M. "An Organizational Analysis of Rural Development Projects at Comilla, East Pakistan." Economic Development and Cultural Change 20, no. 4 (January 1972): 671-690.
- Cline, William R. Economic Consequences of Land Reform in Brazil. Amsterdam: North Holland Publishing Co., 1970.
- Cline, William R. "Interrelationships between Agricultural Strategy and Income Distribution." Food Research Institute Studies in Agricultural Economics Trade & Development 12, no. 2 (1973): 139-157.
- Cochrane, Glynn. "Strategy in Community Development." Journal of Developing Areas 4, no. 1 (October 1969): 5-12.
- Cohen, John M. "Rural Change in Ethiopia: The Chilalo Agricultural Development Unit." Economic Development and Cultural Change 22, no. 4 (July 1974): 580-614.
- Cummings, John Thomas. "The Supply Responsiveness of Indian Farmers in Post-Independence Period: Major Cereal and Cash Crops." Indian Journal of Agricultural Economics 30, no. 1 (January-March 1975): 25-40.

- Development Alternatives, Incorporated. Strategies for Small Farmer Development: An Empirical Study of Rural Development Projects. Boulder, Colo.: Westview Press, 1976.
- Dreitzel, Hans Peter, ed. The Recent Sociology, No. 1. London: The Macmillan Co., 1969.
- Ellman, A. O. "The Introduction of Agricultural Innovations through Co-operative Farming: A Brief Outline of Tanzania's Policies." East African Journal of Rural Development 3, no. 1 (1971): 1-15.
- Epstein, Trude Scarlett and Penny, David H., eds. Opportunity and Response, Case Studies in Economic Development. New York: Humanities Press, 1973.
- Falcon, Walter P. "The Green Revolution: Generations of Problems." American Journal of Agricultural Economics 52, no. 5 (December 1970): 698-710.
- Gitlin, Todd. "Local Pluralism as Theory and Ideology." In Recent Sociology, No. 1, pp. 62-87. Edited by Hans Peter Dreitzel. London: The Macmillan Co., 1969.
- Gotsch, Carl H. "Technical Change and the Distribution of Income in Rural Areas." American Journal of Agricultural Economics 54, no. 2 (May 1972): 326-341.
- Goulet, Denis. "An Ethical Model for the Study of Values." Harvard Educational Review 41, no. 2 (May 1971): 205-227.
- Griffin, Keith B. "Policy Options for Rural Development." Background paper for the Ford Foundation Seminar on Rural Development and Employment, Ibadan, April 9-12, 1973.
- Gurley, John G. "Rural Development in China 1949-72 and the Lessons To Be Learned from It." World Development 3, no. 7-8 (July-August 1975): 455-471.
- Harman, Harry H. Modern Factor Analysis. 2d ed. Chicago: University of Chicago Press, 1967.
- Hayami, Yujiro and Ruttan, Vernon W. Agricultural Development: An International Perspective. Baltimore: The Johns Hopkins Press, 1971.
- Heyer, Judith; Ireri, Dunstan; and Moris, John. Rural Development in Kenya. Nairobi: East African Publishing House, 1971.

- Hinton, William. Fanshen--A Documentary of Revolution in a Chinese Village. New York: Vantage Press, 1966.
- Holton, Richard H. "Marketing Structure and Economic Development." Quarterly Journal of Economics 67, no. 3 (August 1953): 344-361.
- Huntington, Samuel P. Political Order in Changing Societies. New Haven: Yale University Press, 1968.
- Hyden, Goran; Jackson, Robert; and Okumu, John.; eds. Development Administration: The Kenyan Experience. Nairobi: Oxford University Press, 1970.
- International Bank for Reconstruction and Development, Operations Evaluation Department. Agricultural Credit Programs, Report No. 1357. Washington, D.C.: November, 1976.
- International Economic Association. Agricultural Policy in Developing Countries. Proceedings of a Conference held by the International Economic Association at Bad Godesberg, West Germany. Edited by Nurul Islam. London: The Macmillan Co., 1974.
- International Seminar on Change in Agriculture. University of Reading, 1968. Change in Agriculture. Edited by Arthur Hugh Bunting. London: Gerald Duckworth & Co., 1970.
- Jones, William O. "Agricultural Marketing and Economic Development." Paper No. 13 of Cornell Workshop on Save Emerging Issues Accompanying Recent Breakthrough in Food Products, March 30-April 3, 1970. Cornell University. (Mimeographed.)
- Kelley, Truman L. "Comment on Wilson and Worcester's Note on Factor Analysis." Psychometrika 5, no. 2 (June 1940): 117-120.
- Khan, Obaidullah and Hexner, J. Tomas. A Turning Point: Poverty Oriented Rural Development and the U. N. System. Report to the Agriculture Coordination Committee of the United Nations, January 1976.
- Krishna, Raj. "Agricultural Price Policy and Economic Development." In Agricultural Development and Economic Growth. Edited by Herman McDowell Southworth and Bruce F. Johnston. Ithaca: Cornell University Press, 1966.

- Lele, Uma J. The Design of Rural Development: Lessons from Africa. Baltimore: The Johns Hopkins University Press, 1975.
- Lele, Uma J. "Designing Rural Development Programs: Lessons from Past Experiences in Africa." Economic Development and Cultural Change 24, no. 2 (January 1976): 287-308.
- Lele, Uma J. "Role of Credit and Marketing Functions in Agricultural Development." A Paper presented at the International Economic Association Conference on The Place of Agriculture in the Development of Under-developed Countries held at Bad Godesberg, West Germany, August 26-September 4, 1972.
- Lele, Uma J. "The Traders of Sholapur." In Developing Rural India: Plan and Practice, pp. 238-239. Edited by John W. Mellor et al. Ithaca: Cornell University Press, 1968.
- Leonard, David K. "Communication & Deconcentration." In Development Administration: The Kenyan Experience. Edited by Goran Hyden et al. Nairobi: Oxford University Press, 1970.
- Lewis, Stephen R.; Falcon, Walter P.; and Gotsch, Carl H. "The Green Revolution and P.L. 480--Some Parallel Problems." Working Paper No. 3, Agricultural Price Policy and the Development of West Pakistan. Supplemental Working Paper. Harvard University. Development Advisory Service, 2 (1969). (Mimeographed.)
- Lipski, Alexander, ed. Bengal: East & West. Michigan State University. Asian Studies Center. Occasional Paper No. 13. South Asia Series. East Lansing: Michigan State University, 1970.
- Livingston, Ian. "Experimentation in Rural Development: Kenya's Special Rural Development Program." Agricultural Administration 2, no. 3 (July 1976): 217-235.
- McNamara, Robert S. President of the World Bank. Address to the Board of Governors, Nairobi, September 24, 1973. Washington, D.C.: World Bank, 1973.
- Markovitz, Irving Leonard. "Bureaucratic Development and Economic Growth." Journal of Modern African Studies 14, no. 2 (June 1976): 183-200.

- Mbithi, Philip M. Rural Sociology and Rural Development: Its Application in Kenya. Nairobi: East African Literature Bureau, 1974.
- Mellor, John Williams; Weaver, Thomas F.; Lele, Uma J.; and Simon, Sheldon R.; eds. Developing Rural India: Plan and Practice. Ithaca: Cornell University Press, 1968.
- Nellis, John R. "The Planning of Public Support for Tanzanian Rural Development." Journal of Developing Areas 1, no. 4 (July 1967): 477-488.
- Onwubuemeli, Emeka. "Agriculture, the Theory of Economic Development, and the Zande Scheme." Journal of Modern African Studies 12, no. 4 (December 1974): 569-587.
- Owens, Edgar and Shaw, Robert. Development Reconsidered. Lexington, Mass.: Lexington Books, 1972.
- Pratt, R. Cranford. "The Administration of Economic Planning in a Newly Independent State: The Tanzanian Experience 1963-1966." Journal of Commonwealth Political Studies (Leicester) 5, no. 1 (March 1967): 38-59.
- Raper, Arthur Franklin et al, eds. Rural Development in Action: The Comprehensive Experiment at Comilla, East Pakistan. Ithaca: Cornell University Press, 1970.
- Rasmusson, R. "Social Emphasis of Peoples Priorities in Rural Development: Case Studies in Kenya on Results of Decentralised Planning." Agricultural Administration 2, no. 4 (October 1975): 263-285.
- Rayner, A. C. "The Use of Multivariate Analysis in Development Theory: A Critique of the Approach Adopted by Adelman and Morris." Quarterly Journal of Economics 84, no. 4, whole no. 337 (November 1970): 639-647.
- Ruttan, Vernon W. "Integrated Rural Development Programs: A Skeptical Perspective." Agricultural Development Council (1975). (Mimeographed.)
- Shah, S. M. "Growth Center as a Strategy for Rural Development: India Experience." Economic Development and Cultural Change 22, no. 2 (January 1974): 215-228.
- Shertz, Lyle P. "The Green Revolution: Production and World Trade." Columbia Journal of World Business 5, no. 2 (March-April 1970): 53-59.

Waterston, Albert. "A Viable Model for Rural Development." Finance and Development, 11, no. 4 (December 1974): 22-25.

Weitz, Raanan, ed. Rural Development in a Changing World. Cambridge, Mass.: MIT Press, 1971.

Weitz, Raanan and Rokach, Avshalom. Agricultural Development: Planning and Implementation. An Israeli Case Study. New York: Frederick A. Praeger, Inc., 1968.

Wharton, Clifton R., Jr. "The Green Revolution: Cornucopia or Pandora's Box?" Foreign Affairs 47, no. 3 (April 1969): 464-476.

Whyte, Martin King. Small Groups and Political Rituals in China. Berkeley: University of California Press, 1974.