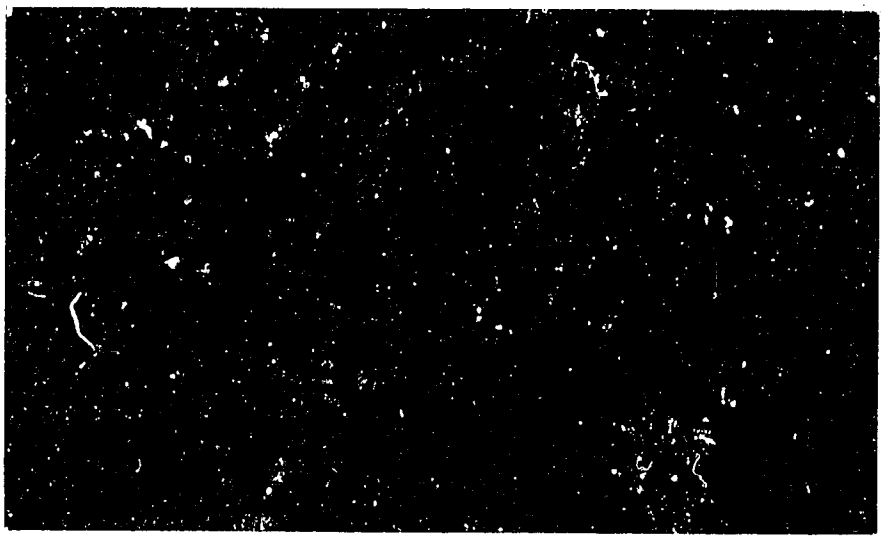

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Statistical Summary of 52 AID Projects: Lessons on Project Effectiveness

by
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EXECUTIVE SUMMARY

This report statistically summarizes post-project evaluation reports by AID for 52 projects. Most are infrastructure projects but eighteen involve education, health or agricultural research. The projects are not randomly selected but they do represent a wide range on most characteristics. The methodology for this study is to have two coders independently read the reports and fill out a code sheet containing 64 dimensions on each project. Most variables are subjective judgments registered on seven-point scales and based on the information in the reports. The analysis is based mainly on the correlations of these variables with a subjective measure of overall effectiveness of the projects.

The analysis of the consequences of these 52 projects indicate that more are successful than unsuccessful, but they tend to have disappointing secondary impacts. For example, an electrification project stimulated far fewer small industries than expected, and an irrigation project which allowed a second crop did not raise family incomes much because it reduced off farm income. Another weakness of the set of 52 projects is their failure to stimulate much private sector development. On the other hand, they have very small social and environmental costs and tend to benefit the poor and reduce inequalities.

The correlation analysis indicates the primary importance of four factors to project effectiveness: good management, quality work force, a strong demand for the project output and good linkages of the project organization to other agencies and the public. High performance on these interrelated factors practically guarantees success and low performance prac-

tically guarantees failure. Weak demand for the project output produces some of the most embarrassing failures. Potable water which people will not drink because of its chlorine taste, roads which are lightly used, and primative health services in areas with better alternatives available are failures which should have been prevented. They suggest the need for better reconnaissance in the project planning stage. The management, staff and linkage factors are regular concerns of AID planners and managers. Unfortunately this study does not determine what contributes to good management. It does suggest, however, that managers' authoritarianism and lack of worker discretion may hinder good management.

The next four most important factors are: a favorable macro context, adequate finances, good maintenance and favorable local values. The only one of these factors which is under the control of the project organization is maintenance and sometimes not even maintenance is. The study looks at the conditions which are associated with good maintenance and finds that the following three are especially important: high demand for the project output, adequate financing and appropriate technology. High demand provides incentives for maintenance, adequate financing provides the resources for maintenance and appropriate technology makes maintenance easier.

This study examines the role of public participation very carefully. The five public participation variables in this study have small or modest correlations with project effectiveness which suggests that public participation is not essential to project success. On the other hand, good relations with the public and fit with local values have high correlations with effectiveness but surprisingly these performances can be attained without significant public participation. In sum, public participation can contribute to good relations with the public and to project effectiveness but in

general it does not play an important role.

When we subdivide the projects by the GNP per capita level of the host country, we find that participation has no relationship to project success in the poorest countries but a strong relationship in the richer countries. Less participatory practices do not seem to have adverse effects in the more backward countries but they are fairly detrimental in the better off third world countries.

This study also examines the role of AID in achieving project success. The original reports say very little about the participation of AID in the projects, so the AID measures have rather low confidence scores. Nevertheless, we find that overall effectiveness is related to a more active role for AID in project design, monitoring and advising. We also learn from a factor analysis that a strong AID influence on a project tends to modestly increase the project's fit with the local context, improve project relations with the general public and reduce centralization of the project.

PREFACE

The author wishes to express his sincere appreciation to numerous people at AID and the University of Maryland who assisted in the production of this report. The early formative stages of the study benefited from the earlier work of Richard Blue and his guidance of the study. Molly Hageboeck contributed useful suggestions on indicating confidence levels for each subjective score. Several members of AID discussed with me issues and critical dimensions in AID projects but particulary Richard Blue, David Steinberg and Cynthia Clapp-Wincek. Finally, John Hourihan has sifted in the development of the coding scheme.

My major indebtedness is to Warren Van Wicklin of the Center of International Development at the University of Maryland. Mr. Van Wicklin served as a research associate, coded all of the projects and frequently discussed the issues of the study. Grey Thompson handled the computer programming responsibilities of the project which often took on the character of high level detective work.

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DESCRIPTION OF THE STUDY

In October 1979 the Agency for International Development began a project evaluation system which would cumulate findings on the impacts of completed projects in order to improve future project designs. The major element in this evaluation system is the growing set of AID Project Impact Evaluation Reports. Each report evaluates a completed AID project or series of projects based on two to four week field visits by two to six evaluators. These evaluations are sufficiently standardized to allow for some cross project comparisons for the purpose of deriving general lessons from them. When enough studies are available for a particular type of project these are analyzed and summarized together. The first of these review studies analyzes the ingredients of successful rural road projects (AID Program Evaluation Report No. 5, Rural Roads Evaluation Summary Report, March, 1982).

The present study reviews and summarizes reports covering 52 projects using the first 52 Project Impact Evaluation Reports. It revises, extends and methodologically upgrades the author's earlier report for AID, A Statistical Review of 44 AID Projects, March 1983, which in turn built upon the initial review effort of Richard N. Blue, The Development Impact of A.I.D. Projects: A Review of Thirty-One Impact Evaluation Reports, April, 1982 (Xeroxed first draft). Conceptually our study is indebted to Richard Blue and many staff members of AID's Office of Evaluation who identified the many factors which contribute to the success or failure of development projects.

The purpose of this study is threefold. First, the 52 projects are

described statistically to give a summary picture of the set of AID projects which have been evaluated to date by the Office of Evaluation. Since these projects have not been selected randomly, our statistical summary describes the set of reported projects and does not describe the total population of AID projects. Nevertheless an effort was made by the Office of Evaluation to include a wide range of projects which varied on region, project type, cost, degree of success, implementation approaches, and length of AID involvement. Furthermore, the sample is not obviously biased toward one type of project. In our judgment, therefore, the results of this study should have wide application for AID projects.

The second and more important purpose of this study is to analyze the relationships between various project characteristics and project effectiveness. We believe that the sample of projects serves this purpose very well even though it is non-random. The major weakness of the study is not the quality of the sample, but rather the sparsity of data in the original reports on many of the characteristics of projects which contribute to project success or failure. On those factors which the reports do describe adequately the study provides useful guidance for project planners.

The third purpose of this study is to address certain issues in the development literature. In particular, we address the issues of public participation in project design, implementation and maintenance, decentralization of project structure, the importance of maintenance of facilities, and the effect of the macro context on the causes of project effectiveness.

METHODOLOGY

The method used in this report is the systematic case review method which scores a sample of cases on a standard set of variables and statistically analyzes the results. In other words the reports on the 52 projects are treated as informants and a standard information questionnaire or code sheet (see Appendix A) is filled out on each report by the coder. Most of the variables in this study (52 out of 64) involve subjective judgments by the coder of the relative level of the project on a seven point scale from low to high or from -3 to +3 based on the information and discussion contained in the evaluation reports. In addition the study includes six objective variables, four subjective variables with different scales and two nominal variables. Two coders are used in this study and their scores are averaged for all computations in this report.

Even though we have devoted considerable effort to achieving reliable judgments on the 52 subjective variables, we must acknowledge that some of our variables were difficult to score with confidence. Some of the variables allow for considerable leeway in judgment, e.g., future benefits and host country commitment to the project. Sometimes the coders use a different frame of reference for their judgments even though the infomation questionnaire and instructions have been revised several times to try to eliminate these disparities. For example, one coder scored a rural road project as distributing less benefits to the poor in the area than to the better off, but the other coder judged the project to benefit mostly the poor because it was built in one of the poorest parts of the country.

Because reliability is a major concern in a study such as this, the coders indicate the level of confidence which they have in each judgment

which they make and the average level of confidence is presented on each variable. Another indicator of reliability is the correlation of the two coders' scores on each variable. About two-thirds of these are .70 or more and the intercoder correlation for the dependent variable, overall effectiveness, is r = .91.

This study is made possible by the fact that 52 evaluation reports addressing a common set of issues have been produced by AID evaluation teams in the past three years. Each team spent several weeks in preparatory study and participated in a training workshop. Then each conducted a three to four week field investigation of the completed project and its impacts. The brevity of the field visits necessitated sampling the projects' outputs, impacts and reception by the community, but appropriate sampling methods were employed where possible and quite intelligent accommodations were made when necessary to difficult research conditions. Project evaluation is a taxing and complex task which requires more than several weeks of investigation by a three to five person evaluation team. Nevertheless, we are impressed with the quality of these reports which were produced under very difficult constraints. A few of the problems were: baseline data usually did not exist, records were seldom complete, the original project staff were no longer around and little relevant secondary data was available.

In sum, caution must be exercised in the use of the findings of this study. Considerable effort has been devoted to making the measuremens of dimensions as reliable as possible including using two coders. Nevertheless, the original reports have their own reliability problems and often provide little or no direct discussion on some of the variables in this study. To guide the reader on the relative reliability of various vari-

ables we report in Table 2 intercoder correlations and coder confidence judgments.

PARAMETERS OF THE SET OF 52 SELECTED AID PROJECTS

The basic parameters of the set of 52 selected projects are presented in Tables 1 and 2. Table 1 presents the frequencies for the objective, nominal and unique scale subjective variables. Table 2 presents the means and standard deviations for all of the seven-point subjective scale variables.

The big question in an evaluation study is how successful is the project? This evaluation of the projects selected for review is mixed. On the one hand many of the reviewed projects are reasonably successful. In terms of attaining at least 75% of their goals 37% are considered successful and in terms of overall effectiveness 42% are considered successful (score of 7.0 or better). On the other hand, there are also a fairly large number of failures. About three out of ten (29%) would be classified as unsuccessful in that they failed to attain 50% of their goals or less and 25% were unsuccessful in terms of scoring only 3.0 or less on the overall effectiveness scale.

Table 2 focuses on the results of the projects and the factors which contributed to their success or failure. It presents means, standard deviations, average confidence scores, and intercoder correlations. The seven-point scale ranged from 1 = exceptionally low to 7 = exceptionally high except for 6 variables indicated by an asterick which ranged from -3 to +3. Scores on these subjective variables were judged relative to other projects of the same general type.

The confidence score was judged by each coder for each variable on each project using a five-point scale as follows:

1 = very little confidence and very strong doubts

2 = little confidence and many doubts

3 = fair confidence but considerable doubts

4 = good confidence and few doubts

5 = great confidence and very little doubts

Each coder considered the amount and quality of the information in the report on the variable in question and also considered the methodology of the study team which produced the report. Each reported confidence scores is the average of the coders' mean confidence scores for the 52 reports for that variable. They range from 1.80 for continuity of personnel, which was seldom discussed directly in the reports, to 3.88 for amount of facilities produced, a rather concrete factor.

Table 1 Frequencies for Objective, Nominal and Unique Scale Subjective Variables for 52 Selected AID Projects

Variable	Categories		Frequency	Percent
1. Overall effectiveness (scale of 0-10)	Unsuccessful	(0-3)	13	25.0
	So-so	(4-6)	17	32.7
	Successful	(7-10)	22	42.3
2. Goal attainment	0%-24%		4	7.7
	25%-49%		11	21.2
	50%-74%		18	34.6
	75%-100%		17	32.7
	over 100%		2	3.8
3. Region	Africa		16	30.8
	Asia		20	38.5
	Latin America		16	30.8
4. Beginning Date	1969 and earlier		20	38.5
	1970 and later		32	61.5
5. Completion Date	1979 and earlier		28	53.8
	1980 and later		24	46.2
6. Number of Impacted Communities	1		0	0
	2-5		2	3.8
	6-20		3	5.8
	21-100		13	25.0
	over 100		34	65.4
7. Emphasized Output	facilities		32	61.5
	training		7	13.5
	technology		9	17.3
	organization		1	1.9
	uncertain		3	5.8
8. Part of a Continuous Program	no		9	17.3
	partly		23	44.2
	entirely		20	38.5
9. Total Cost of Project	under $1 million		3	5.8
	$1-10 million		20	38.5
	$10-50 million		22	42.3
	$50+ million		7	13.5
10. Lead Implementing Organization	national government agency		33	63.5
	regional or local government agency		9	17.3
	non-government agency		10	19.2

Variable	Categories	Frequency	Percent
11. Per Capita Income of Host Country, 1980	$0-499	18	34.6
	$500-999	17	32.7
	$1000-1999	17	32.7
12. Type of Project	rural roads	9	17.3
	rural electrification	4	7.7
	irrigation	7	13.5
	portable water	6	11.5
	agricultural research	9	17.3
	housing	1	1.9
	health	3	5.8
	education	6	11.5
	general development	7	13.5

Table 2 Parameters of the Subjective Seven-Point Ordinal Variable for 52 AID Projects

Variable	Mean	Standard Deviation	Mean Confidence Score	Correlation of scores of Two Coders
1. Amount of facilities produced	4.20	1.53	3.88	.80
2. Amount of training provided	3.11	1.59	3.64	.85
3. Amount of technology transferred	2.59	1.43	3.53	.72
4. Amount of organization instituted	2.88	1.13	3.57	.53
5. Overall amount of outputs	4.38	1.14	3.65	.74
6. Long term continuation of major output	4.35	1.48	3.25	.77
7. Amount of increased production resulting from outputs	4.42	1.50	3.27	.77
8. Secondary benefits of increased production	3.86	1.48	2.88	.79
9. Family income benefits	3.57	1.55	3.11	.83
10. Social benefits	3.88	1.41	2.88	.75
11. Ratio of production and secondary benefits to outputs	4.18	1.63	3.13	.70
12. Direct private sector development	2.43	1.57	2.88	.82
13. Indirect private sector development	3.05	1.89	2.83	.82
14. Estimated standard benefit/cost analyses*	0.27	1.91	2.98	.87
15. Social costs	1.90	.99	2.58	.55
16. Environmental costs	2.21	1.39	2.84	.76
17. Inequalities increase + or decrease -*	-0.26	1.66	3.04	.79
18. Net future project benefit/cost	4.51	1.61	2.97	.82
19. Understanding between agencies	3.49	1.47	2.95	.73
20. Understanding with public	3.65	1.55	2.88	.74
21. Quality of implementation	4.00	1.56	3.12	.83
22. Scheduling success	4.06	1.57	3.06	.74
23. Coordination success	3.94	1.50	2.85	.83

Variable	Mean	Standard Dev.	Confidence Score	Coders' Corr.
24. Red tape	2.99	1.43	2.24	.79
25. Managers' authoritarianism	3.40	1.13	2.06	.42
26. Personnel continuity	4.15	.96	1.79	.52
27. Personnel discression	4.28	1.08	2.01	.47
28. Personnel skill and motivation	4.68	1.25	2.75	.67
29. Beneficiaries' motivation	4.89	1.30	3.05	.74
30. Beneficiaries' skill	4.33	1.11	2.92	.62
31. Desirability of service	5.19	1.52	3.30	.77
32. Short term maintenance	4.97	1.54	3.05	.81
33. Long term maintenance	4.27	1.70	2.88	.83
34. Adequacy of financing	4.15	1.43	3.24	.67
35. Availability of parts	4.09	1.29	2.31	.63
36. Equipment servicing	4.23	1.28	2.41	.53
37. Local resouces	4.08	1.44	2.36	.61
38. Ministry centralization	4.76	1.14	2.57	.55
39. Project centralization	3.38	1.33	2.93	.69
40. Participation in design	1.55	.86	3.35	.50
41. Participation in implementation	4.02	1.57	3.15	.79
42. Participation in maintenance	3.77	1.74	2.88	.89
43. Organization of beneficiaries	2.93	1.77	2.76	.81
44. Self motivated organization	4.98	1.32	2.61	.77
45. Host country commitment	4.40	1.61	3.36	.77
46. AID help design	3.99	1.43	2.64	.72
47. AID monitoring	3.98	1.20	2.40	.64
48. AID advising	3.17	1.23	2.37	.64
49. Favorable economic policies*	0.06	1.08	2.70	.67
50. Favorable market factors*s	0.70	1.33	2.88	.70
51. Favorable macro events*	-0.47	1.37	2.62	.59
52. Favorable local values*	0.91	1.22	2.94	.63
53. Overall Effectiveness#	5.55	2.48	3.52	.91

*scale is -3 to +3 with 0 standing for neutral

#scale is 0-10

It should be pointed out that several of the management variables had very low confidence scores, especially red tape, managers authoritarianism, continuity of personnel and amount of discretion of project team members. In fact the reports are weakest in describing the management of the projects. The reports are strongest in describing the results of the project and the more visible or obvious causes of success or failure such as schedule delays, shortage of funds, important market or price changes and maintenance practices. The inner workings of the project organization, however, are inadequately described in most reports. Two other sets of factors with generally low confidence scores are the role of AID and the macro context. Most reports had very little to say about the role of AID. More was said about the macro context in most reports, but the discussions, of necessity, were highly selective and often involved pro and con factors which were difficult to weight relative to each other to come out with a net score.

The correlations between each coder's scores on each variable is presented as a measure of coder consensus on each variable. In general, they are high when the confidence scores are also high but there are some exceptions. The coders felt pretty confident when coding the extent of institutionalized organizational development and the degree of public participation in project design but pretty much disagreed in their judgments on these two variables. Both turn out to be highly interpretive variables. On the other hand, the coders had very little confidence in their judgments on the degree of bureaucratic red tape but ended up with very similar estimates.

Table 2 is a very important table for interpreting the results of this study. First the means give some indication of the average level of performance found among the 52 projects on each variable. Second, the standard deviation gives some indication of the degree of variation in performance found among the 52 projects on each variable. It should be noted that variables which have little variation are going to have only low or modest correlations with project effectiveness even though they may be important to project success or failure in the few times that they do vary significantly. Third, the confidence scores and the intercoder correlations are crude estimates of the reliability of the measures used in the study. The general rule is that unreliability or measurement error will cause the correlation coefficient to be lower than it should be. In other words, measurement error tends to hide or underplay relationships between variables making them to appear weaker than they really are. Finally, the two estimates of reliability crudely indicate the degree of confidence to place in specific findings.

There are several points we want to make on the set of mean scores. First, the set of projects emphasize constructing facilities more than other outputs but they also involve a fair amount of training and even organizational development (see nos. 1-4). Second, this set of projects is a mixture of failures and successes with a fairly average overall performance level as seen in nos. 5-18. These projects have a fair level of overall outputs and production resulting from these outputs, but have more modest secondary benefits from this production (see nos. 5-11). On the average the coders estimate that a standard economic benefit/cost analysis would be slightly positive for

these projects (no. 14). A strong point of the projects is that social and environmental costs are extremely low on average (nos. 15 and 16). The projects' record on special AID objectives is mixed. On average they haved rather poor effects on private sector development on the one hand, but tended to reach the poor and reduce inequalities on the other hand (nos. 12, 13 and 17). Finally, future benefits of the project are expected to exceed future costs in the majority of cases (no. 18) largely because the sunk costs have already been paid for by AID and the national government.

The third general point to notice is that most of the implementation and management variables are neither exceptionally good nor exceptionally bad except that red tape and managers' authoritarianism are rather low (nos. 24 and 25). The luke warm evaluation of implementation and management is probably due in part to the sparsity of data on management practices.

The fourth point is that the relations of the project organization with the public and beneficaries are mixed. The projects tend to fit local values (no. 52) and to provide services suitable to and strongly desired by the beneficiaries (nos. 29-31); nevertheless, the understanding of the project organization with the general public is slightly unsatisfactory on average (no. 20), public participation in project design is negligible (no. 40), and the beneficiaries are not organized for their role in the project the majority of the time (no. 43). These negative features are softened but not nullified by the fact that public participation in implementation and maintenance is more average (nos. 41 and 42), and when the beneficiaries are organized for their role in the project, their organization is usually self

motivated (no. 44).

The final general lesson is that the macro context is slightly favorable to the projects on average. Host country commitment and market factors were reasonably positive (nos. 45 and 50) while only macro events tended to be slightly negative on average (no. 51).

Not much needs to be said about the standard deviations except to point out the implications of some of the very small ones. Social costs (no. 15) and public participation in project design (no. 40) have low means and very small standard deviations which means that there is a strong pattern among the projects of low social costs and very little public participation in project design. Economic policies (no. 49) are neutral on average with a small standard deviation which means that economic policies seldom have any affect on the success or failure of the projects. Finally, ministry centralization (no. 38) has a relatively high mean and a small standard deviation which means that there is a fairly strong pattern, with few exceptions, of national government ministries being fairly centralized.

THE COMPONENTS OF PROJECT EFFECTIVENESS

Project effectiveness is defined in this study in terms of the ratio of total benefits to total costs. As we use the term effective, a project which efficiently produces a high quality road which no one uses is not effective. Also a project which produces a well engineered road which is highly used but is not maintained and is unusable two years later is not effective. Finally a project which produces a useful road but also produces severe negative consequences such as the road project in Liberia in which the peasants lost their land is not effective. In addition, the project gets some extra credit if a good portion of the benefits reaches the lower strata and if the communities' capacity to act in their own behalf is increased. By including these several dimensions in our concept of overall effectiveness we have tried to make it correspond with the general notion which is current among AID and other development agencies as to what constitutes a "good" project.

Twenty-one indicators of various consequences of projects are used in this study. Projects are scored on subjective seven-point scales on the amount and quality of their outputs, and the consequences of these outputs. The main outputs of the reviewed projects are increases in or improvements of of the four factors of production: facilities, occupational skills, technology and organization. These in turn are used to produce goods or services which in turn cause secondary impacts. We classify project consequences, therefore, into three categories: factors of production, production and secondary impacts.

The types of projects reviewed in this set of project reports mainly produce facilities, i.e., roads, irrigation works, portable water systems, rural electric power systems, new towns and housing. Some training, technology transfer and organizational or institutional capacity are produced along with these facilities. Other projects focus on training or technology (mainly agricultural) transfer or development. The goal of the projects, however, is to increase the economic production of the target communities and the quality of life of their inhabitants through high rates of utilization of the produced facilities, training, technology or institutional capacities. The full range of secondary impacts, therefore, are taken into account in evaluating projects.

The indicator of project effectiveness or success used throughout this study is the subjective score by the coders of the overall effectiveness of the project in terms of all benefits and costs using a scale from 0 to 10. It has a very high intercoder correlation and confidence score. It also correlates at $r = .96$ with the principle factor in a factor analysis of the indicators of the consequences of the project. Thus, it is the best single indicator for evaluating the projects.

Table 3 presents the correlations of 21 indicators of the consequences of projects with the principle factor in the factor analysis of these variables. The variables with the highest loadings on the principle factor are the most global variables: overall effectiveness, economic benefit/cost score, secondary benefits, productivity, attainment of purposes, increased production, future benefits, social benefits, and total direct outputs. Specific direct outputs, direct

private sector development in the implementation of the project, social and environmental costs and decreasing inequalities have low loadings. The social and environmental costs had low loadings because they were almost always quite small. As a matter of fact, the only project which was judged to have substantial social costs was a road project in Liberia which resulted in wealthy individuals pressuring local chiefs into selling large blocks of tribal land which the roads made more valuable. As a result settled farmers were displaced. All other projects had none, negligible or occasionally modest reported social costs.

Table 3 Factor loadings of Indicators of Project Consequences on the Principle Factor of an Unrotated Factor Analysis of These Variables (n = 52 projects)

Indicators of Project Consequences	Factor Loading
Degree of attainment of purposes	.89
Amount of facilities produced	.27
Amount of training provided	.10
Amount of technology transferred	.17
Amount of organization instituted	.39
Overall amount of above outputs	.81
Long term continuation of major output	.70
Amount of increased production resulting from above outputs	.88
Secondary benefits of increased production	.93
Family income benefits	.79
Social benefits	.83
Ratio of production and secondary benefits to the above outputs	.91
Direct private sector development	.20
Indirect private sector development	.65
Estimated standard economic benefit/cost analysis	.94
Social costs	-.06
Environmental costs	.13
Decrease in inequalities	.33
Net future project benefit/cost	.83
Overall projective effectiveness	.96

The principle component factor analysis has three factors in addition to the primary factor with eigen values greater than 1.0. Together these accounted for only 30% of the total variance compared to 43% for the primary factor. The second factor has high positive loadings for direct private sector development, high environmental costs, and amount of facilities produced and high negative loadings for emphasis on training, technology or organizational outputs. This factor differentiates between facility projects and non-facility projects and picks up other variables which are related to this dimension. The third factor is the social cost factor (social costs loads at .62) on which facilities loads negatively and technology transfer, environmental costs and increasing inequality loads positively. The fourth factor is the inequality factor (increasing inequalities loads at .52) with no other variable with a high loading.

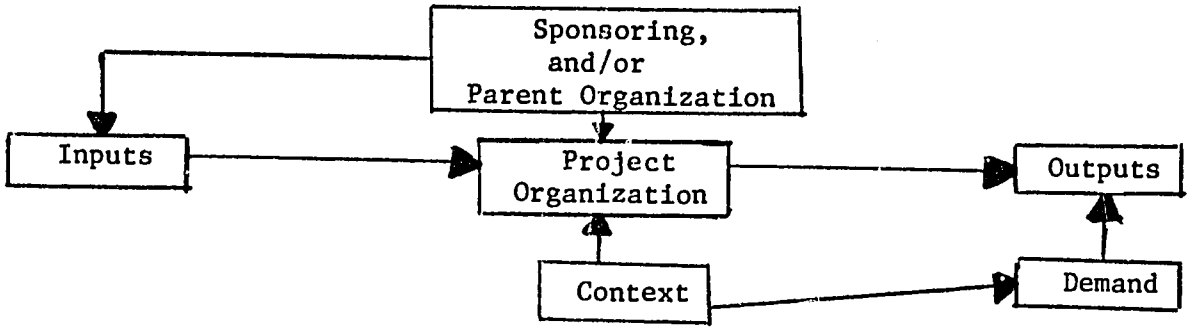
THEORETICAL MODEL OF PROJECT EFFECTIVENESS

What factors contribute to project effectiveness? We have developed a fairly inclusive additive model of the causes of project effectiveness based on three sources. First, experienced AID staff members and the evaluation teams which wrote the reports on the 52 projects have suggested many factors which contribute to project success. Second, the development literature was reviewed for additional suggestions. Finally, the organizational effectiveness literature, which is based largely on the american experience, suggests yet some additional factors.

Figure 1 diagrams and specifies our model of the additive causes of project effectiveness. Each factor is supposed to contribute independently to project effectiveness. By and large contingency factors have been left out of the model even though they are important in the organizational effectiveness literature. Variables like formalization, complexity, size, horizontal versus vertical communication patterns are helpful in some contexts and harmful in others. Since their relation to project effectiveness is dependent on context and therefore ambiguous in the generic case, they are not included in this additive model, but should be included in more complex models. Three contingency factors, however, are included in the additive model as additive variables. They are converted from contingency to additive variables by scoring their degree of fit with their context. Appropriate capital, appropriate technology and congruence of technology with organizational structure all contribute additively to project effectiveness. As an example, of how such variables would be scored we

FIGURE 1

CAUSES OF PROJECT EFFECTIVENESS



I. Inputs (quantity and quality of the factors of production).

A. Labor (1) capability (skill, experience, specialization) (+), (2) motivation (commitment, enthusiasm, reliability) (+), (3) attitudes (discipline and work values) (+), (4) lack of corruption, and (5) voluntary labor (+).

B. Capital (1) maintenance (+), (2) appropriateness (+), (3) adequacy (+), and (4) rate of utilization.

C. Technology (1) appropriateness and (2) fit with structure of organization.

D. Resources (1) reliable supply, (2) reasonable prices, and (3) local availability (+).

II. Project Organization (characteristics and actions)

A. Structural (1) decentralization (+), (2) low stratification, (3) specialization (division of labor, departmentalization), and (4) participation of beneficiaries in design and other functions.

B. Managerial (1) scheduling success (+), (2) coordination (+), (3) understanding (between components, with other organizations, with parent organization and with public) (+), (4) planning and design (+), (5) flexible implementation of the design (+), (6) information processing system (feedback), (7) conflict management, and (8) rewards for performance.

C. Qualities (1) leadership (+), (2) experience (+), (3) rational-legal, (4) clarity of objectives, and (5) congruence of objectives from top to bottom.

III. Parent Organization

A. Adequacy of Financing (+)

B. Monitoring and Guidance (+)

C. Technical and Managerial Aid (+)

D. Responsiveness (lack of red tape) (+)

IV. Context

A. Macro (1) conducive markets (+), (2) government commitment (+), (3) conducive policies (0), (4) conducive events (+), (5) effective linkage with other organizations (+), (6) lack of restrictions (-), (7) predictability and (8) development level (+).

B. Local (1) acceptance (+), (2) support (+), (3) participation (+), and (4) organization (+)

V. Demand

A. Awareness of outputs (1) markets, (2) extension agents, (3) promotion of output, and (4) train beneficiaries

B. Desire for outputs (+)

C. Low Competition from other producers

D. Reliability of demand

E. Purchase or use of outputs

VI. Consequences (production of outputs and achievements of purposes and goals)

A. Creation and delivery of facilities, training, technology or organization.

B. Use of the above facilities, training, technology or organization to increase production of goods and services.

C. Secondary benefits of the above production (multiplier effects)

D. low costs of the above production and secondary impacts (1) economic (budget), (2) social and (3) environmental

E. Equity in the distribution of benefits

propose that simple technology and capital should be considered as "appropriate" in the context of poor communities with excess labor but limited technical skills.

The model begins with the inputting of the four basic factors of production: labor, capital, technology and resources. The level of financing largely determines the quantity of these factors but the quality of these factors are also functions of the design and management of the project. Capable, motivated and honest labor with proper attitudes are crucial to project success. Some projects also benefit from considerable voluntary labor. Capital must be appropriate to the situation, effectively utilized and well maintained. Technology likewise must be appropriate to the situation and the implementing organization. Resources need to be reliably available at reasonable prices.

Project effectiveness is greatly affected by structural, managerial and qualitative features of the implementing organization. The development literature complains that centralization and hierarchy interfere with project success even though the organizational literature is more ambivilant on the effect of these variables. The organizational literature sings the virtues of specialization though excessive specialization can lead to alienation. The eight dimensions of good management listed in the model are commonly touted in management science as are the five qualitative characteristics of effective organizations.

Though the development literature frequently discusses the relationship between the parent or sponsoring organization and the project organization, these discussions emphasize unique situations more than generic dimensions. We have identified only four commonly cited generic dimensions for the linkage with the parent organization. The same emphasis on unique

situations dominates the discussion of the macro and micro (local) context for development projects. We have culled out, however, several generic categories for accounting for many of the specific macro and micro influences on project success in the literature.

Finally, we list several demand and output dimensions. The former add up to high effective demand for the project product or service and the latter classifies outputs into three categories: factors of production, the production of goods and services using the factors of production, and higher order impacts of the increased production. The last level involves both positive and negative impacts.

Figure 1 presents the model which underlies this study. Not every component of the model could be measured on this data set but many were measured at least in part (see Appendix A for the measures used). Those factors which correlate with project effectiveness at the .05 level of significance (one tail test) are identified by the sign of their correlation. (The coefficients are found in Table 3.) One factor, conducive policies, does not correlate with project effectiveness at the .05 level of significance and is indicated by a (0).

THE CAUSES OF OVERALL EFFECTIVENESS

The major findings of this study are the correlations of overall effectiveness with the factors contributing to project success (see Table 4). Many of these correlations are very high and confirm commonly held notions about the requisites for project success. All variables correlate with project effectiveness in the expected directions and almost all correlations are statistically significant. In this respect this study supports the conventional wisdom in the development literature and the experienced opinions of my informants in AID. It also supports the theoretical model presented in the last section at the points where measures for the model's dimensions are included in this study.

Four important factors are represented at the top of the list in Table 4: management, labor, demand and linkages. The quality of management is represented among variables correlating at over .50 by variables Nos. 1, 8 and 14; the quality of the work force by variable No. 2; the strength of the demand for the project output by variables Nos. 3, 5, an 10; and the quality of the linkage of the project organization to other agencies and the public by variables Nos. 6 and 7. Near the top of the list four more factors are represented: macro context, finances, maintenance and micro context. Favorable macro context is represented among variables correlating at over .50 by variable No. 10, maintenance by variables Nos. 11 and 15, finances by variable No. 12, and macro context by variable No. 16. Thus every element in the diagram in Figure 1 is represented by a variable which correlates with project effectivess at over .50.

What are the lessons to be derived from Table 4? First, the quality of the implementation of the project seems to be the key factor in overall effectiveness. Indeed the two concepts overlap. A project which achieves

Table 4. Pearson Zero Order Correlations for 36 Selected Characteristics of AID Development Projects and Characteristics of Their Contexts with a Subjective Measure of the Overall Effectiveness of the Projects (n = 52)

Independent Variable	Correlation with Overall Effectiveness	
	coefficient	significance (one tail test)
1. Overall quality of implementation	.85	.000
2. Skill and motivation of implementors	.77	.000
3. Desirability of project service to beneficiaries	.74	.000
4. Skill and resources of beneficiaries	.72	.000
5. Motivation of beneficiaries to benefit or participate	.67	.000
6. Understanding between agency and the public	.67	.000
Understanding among relevant agencies	.64	.000
8. Overall coordination of the project	.64	.000
9. Extent equipment can be locally maintained	.60	.000
10. Favorable market factors	.58	.000
11. Maintenance up to two years after completion	.58	.000
12. Adequacy of financing	.57	.000
13. Local availability of resources	.57	.000
14. Scheduling and timing success	.53	.000
15. Maintenance after two years after completion	.53	.000
16. Favorable local values	.50	.000
17. Continuity of project personnel	.48	.000
18. Local availability of equipment parts	.45	.001
19. Discretion of project personnel	.44	.001
20. Public participation in implementation	.42	.001
21. Centralization of project administration	-.39	.002
22. Extent or red tape	-.36	.004
23. Favorable non-economic macro context	.35	.005
24. Host country commitment	.35	.006
25. AID influence in monitoring project	.32	.010
26. Authoritarian style of top management	-.31	.012
27. Extent beneficiaries' organization was self-motivated	.31	.013
28. AID influence in advising the project	.30	.016
29. GNP per capita	.30	.016
30. Public participation in maintenance	.29	.017
31. Extent beneficiaries organized for their participation	.26	.033
32. AID influence in designing project	.24	.046
33. Public participation in design of project	.23	.050
34. Centralization of the responsible government ministry	-.22	.057
35. Favorableness of government economic or trade policies	.18	.098
36. Part of continuous program	.17	.110

its goals but is poorly implemented is not judged to be effective as much as it is judged to be lucky. Nevertheless, effectiveness is not identical to quality implementation because a skillfully implemented project could fail due to external factors. Quality implementation involves skilled and motivated implementors and good management. The project reports discussed the former variable but contain little information on management practices. The reports did indicate whether schedules were met and activities were coordinted but often did not say how this was achieved.

Quality of implementation correlates with skilled and motivated implementors at $r = .87$, with overall coordination at $r = .84$, with scheduling success at $r = .78$, with understanding and cooperation among relevant agencies at $r = .77$, with red tape at $r = -.52$, with degree of discretion of project personnel at $r = .39$, and with managers' authoritarianism at $r = -.32$. The last three variables are the study's only measures of management practices and they are very crude, they have low intercoder correlations (except red tape), they have very low confidence scores and they contain much error. Since measurement error, if it is random, lowers correlations, the relatively low correlations of discretion and authoritarian with effectiveness underplay the strength of the relationships. Nevertheless, we conclude that managers' authoritarianism and lack of worker discretion is not very detrimental to successful management and successful projects in these types of third world projects. In sum, good workers and good management are crucial to project success, but we have not determined in this study what good management is other than the minimization of red tape. Good management, however, seems to be evidenced by coordination, scheduling success and good linkages with other relevant agencies.

The second lesson to be derived from Table 4 is the importance of the

project producing desirable outputs. This finding is based on the high correlations of overall effectiveness with the desirability of the project service to the beneficiaries at r = .74 and the motivation of beneficiaries to benefit from the project at r = .67. These two variables overlap. The former gauges the desire of beneficiaries specifically for the project's services, and the latter gauges the desire of the beneficiaries for the general type of benefit. We also considered the skill and resources of the beneficiaries for utilizing the project's services which correlated with overall effectiveness at r = .72. Together these three variables serve to measure effective demand for the project's services.

What could be more obvious than the finding that projects are not effective unless there is strong effective demand for their services? Nevertheless, this lesson is easily forgotten and must be relearned again and again. If there were good effective demand for almost all AID projects, then these variables would have little variance and much lower correlations with effectiveness. But sometimes AID still funds projects which provide low value products. Roads are built which are barely used, potable water goes undrunk because of the chlorine taste, or basic health programs are provided in areas where more valued alternatives are available. Thus a major reason for project failure seems to be inadequate testing of the desirability of the product of the project.

The third lesson to be learned from Table 4 is that it is important that the project organization has good linkages with the sponsoring or parent organization, with other relevant agencies and with the public. Overall effectiveness correlates with understanding between project organization and the public at r = .67, with understanding among relevant agencies at r = .64, with adequacy of financing at r = .57 and with host coun-

try commitment at r = .35. In some projects the public is largely ignored to the serious detriment of the project. For example, an agricultural research project in Nepal failed to articulate with the farmers and take into account their objectives, resources and constraints. As a result the researchers developed varieties and practices which most farmers did not have the means to utilize. Other projects are hindered by poor working relations between involved agencies. For example, an AID assisted research center in Thailand is relatively ineffective because "...bureaucratic conflict has created an atmosphere in which much research done at the Center is rejected out of hand by the Central Ministry of Agriculture and often has to be redone in order to be acceptable" (Project Impact Evaluation Report, No. 34, p. iv). Other projects have failed in part because credit institutions do not provide credit to farmers, extension services are inadequate, AID does not provide adequate supervision, inputs are provided late, another government ministry sets up a program in direct competition and because of many other inter-agency difficulties.

Unfortunately these reports do not provide guidance on how good working relations with other agencies can be achieved. They do provided, however, some guidance on what creates good linkages to the public. First and foremost the project should be providing a highly desirable product. Nothing makes for better public relations than giving the public what it wants (understanding with the public correlates with desirability of the project service to beneficiaries at r = .56. Second, the project should fit in with the values and social patterns of the recipient communities (r = .60). Third, the project should frequently involve the public in project design, implementation and maintenance (r = .36, .46 and .29, respectively). Clearly relations with the public can be good (and projects can be success-

ful) even when the public is not significantly involved in these three phases of the project, but public involvement helps. In fact, among the 52 cases we do not notice any projects which had too much participation and we do notice a number with too little participation and which suffered as a result. If present practice is to be changed, therefore, on the average it should be to increase participation. It is not uncommon for evaluation teams to make recommendations like the following: "Water projects should be designed to reflect demonstrated community need rather than prepackaged donor solutions; projects should be planned collaboratively by benefactors and beneficiaries" (Project Impact Evaluation Report, No. 10, p. 16).

The fourth lesson from Table 4 is the vulnerability of these types of projects to the conditions of the macro context. Market factors in particular affect the success or failure of the project. For example, government-supported official prices contributed to the success of a number of irrigation and agricultural research projects. In another example, a radio correspondence teacher education program was enthusiastically received because teachers' salaries increased appreciably when they earned additional credits through the courses. In addition to market factors we look at government economic policies or trade policies and at non-economic macro events. The former is important to overall effectiveness in a few cases but in most cases it is not ($r = .18$). The latter is important more often ($r = .35$) but macro non-economic events are not a major determinant of project effectiveness on the average. The same remarks hold for host country commitment to the projects ($r = .35$). It certainly helps, especially if it determines the adequacy of financing, but many good projects have rather poor support. Of course, government opposition would kill almost all projects, but we studied no case involving actual opposition.

The fifth lesson from Table 4 is the importance of maintenance. Both short term and longer term maintenance are important to project success (r = .58 and .53 respectively) as the AID literature points out time and time again. Some of the most discouraging reports are ones which describe a well designed and well implemented project which produces many benefits but is threatened by the deterioration of the facilities through poor maintenance. Certainly the authors of the reports see maintenance as a high priority concern, and the Rural Roads Evaluation Summary Report (A.I.D. Program Evaluation Report, No. 5) states:

> Maintenance of roads is of increasing concern to AID and other donors. Except in a few countries, maintenance of roads has been woefully neglected, as confirmed by six of the eight rural road impact evaluations. The deterioration of a road results in high political, social, economic, and environmental costs and may result in a complete loss of the original investment. The working group feels that it is essential to protect that investment by establishing a systematic, efficient, and adequate maintenance capability. (p. 46)

Related to good maintenance are three variables dealing with capital, technology and resources. The extent equipment can be maintained locally, the local availability of resources and the local availability of equipment parts. They are strongly correlated with overall effectiveness (r = .60, .57 and .45 respectively), which seems to support the appropriate technology thesis. These variables also correlate strongly with the maintenance variables (average correlation is .55) which suggests that local competence and supplies is very conducive to good maintenance.

The sixth lesson from Table 4 is the limited importance of public participation for overall effectiveness. The study contains five variables directly dealing with public participation. All are correlated with overall effectiveness but only modestly. Correlations for participation in

design, implementation, and maintenance are r = .23, .42 and .29 and for organization for participation and self motivation for organizing are r = .26 and 31 respectively. In sum, participation is not essential to project success on the average. Nevertheless good relations with the public is essential (r = .67) as discussed earlier and greater participation is a good way to improve relations with the public. Also these project reports often advocate the need for more participation and never point to a case of too much participation.

The seventh lesson from Table 4 is that overall effectiveness is related to a more active role for AID in project design, monitoring and advising (r = .24, and .32 and .30 respectively). Most of these reports provide very little information on the role of AID in the projects and the coders are relatively unsure of their scores on the AID variables, nevertheless, it seems that active AID involvement tends to improve project effectiveness. For example, the team evaluating the Sine Saloum rural health care project in Senegal states:

> Cutting across all the difficulties which beset the project is the clear failure of A.I.D. to manage the project prudently and effectively.
>
> A.I.D. has not provided adequately the one ingredient which the recipient country has every reason to expect--firm, experienced project management and technical assistance. The Mission appears to have operated with a kind of 'arm's length' or 'hands off' style, taking the position that it was up to the Senegalese Government and the villagers to take responsibility and solve the problems. Adequate mechanisms for the effective exercise of Senegalese and A.I.D. joint responsibilities for the project were not established. This is a sure formula for failure and the result, for over 800,000 people in rural Sine Saloum, is likely to be only increased, but unfulfilled, expectations and the consequent frustration and alienation from government health and other development projects. (Project Impact Evaluation Report, No. 9, p. iii).

The above comments do not exhaust the lessons from Table 4 but are presented as the mort important ones. Certainly the importance of adequate financing, modest negative effects of centralization, and the modest positive effects of higher levels of GNP per capita, should not be overlooked. In summary, all variables are correlated with effectiveness in the expected directions and little has been reported so far in this study which is at odds with current thinking in development circles.

LINKING CAUSES OF PROJECT EFFECTIVENESS

The previous section looks at the zero order correlations of project effectiveness with 37 variables which are believed to contribute to the success or failure of projects. The zero order correlation coefficient, however, is an accurate indicator of the strengh of the relationships between cause and effect only if "all other things are equal" (other relevant variables are controlled). This requires experimental conditions which are impossible to obtain in fact or even to approximate through statistical controls. It is necessary, therefore, to be aware of the statistical links (666 correlations) between the various variables (independent) causing project effectiveness in order not to be misled by the zero order correlations. Obviously there are too many correlations to analyze and we need to greatly condense the information contained in them. The standard procedure for condensing this information is factor analysis, and we present and discuss the factor analysis of these variables in this section.

Factor analysis summarizes a matrix of correlation coefficients in two ways: the principle component factor analysis and the rotated factor analysis. The principle component factor analysis starts with the factor which has the highest correlations with all of the variables in the analysis. It is like a politician whose views are the most compatible with all of the views of the electorate. He is representative but not very distinctive. The rest of the principle component factor analysis consists of factors which pick up the variance in the variables which does not get picked up by the principle factor. Each factor is mathematically perpendicular to each other and together constitute the factor structure. The rotated factor analysis keeps the factor structure but rotates it so it better fits the natural groupings of the variables. Thus the distinctive

groups of variables are more clearly identified by the rotated factor analysis. It produces factors which are like spokespersons for special interests and are unlike the politician who blends with the most voters. The rotated factors represent only distinct groups while the principle factor represents the general public.

The principle component factor contains the implementation, maintenance, and demand variables (these have high loadings on the factor). All of the rest of the variables also load on the principle component factor at .23 or better except for total budget. The variable with the highest loading is quality of implementation at .89.

When the factor structure is orthogonally rotated, ten factors emerge with eigenvalues greater than 1.0. The first four factors are presented in Table 5 with all independent variables which load on at least one of these factors at over .40. We name these four factors: implementation, maintenance, demand, and authoritarianism. The variables in these four factors load fairly highly on the unrotated principle component factor (average loadings for these sets of variables being .72, .63, .67 and .41 respectively). When the factor structure is rotated these factors are separated out even though they are somewhat related as the correlations among their component variables indicates. For example, quality implementation correlates with short term maintenance at r = .55, with motivation of beneficiaries at r = .55 and with personnel discretion at r = .39. Short term maintenance correlates and with motivation of beneficiaries at r = .38 and with personnal discretion at r = .12. Motivation of beneficiaries correlates with personnel discretion at r = .35.

The main lesson of Table 5 is the fact that the variables which highly load on these four factors act as four groups of variables rather than as

Table 5. First Four Factors of the Orthogonally Related Factor Matrix of the Causes of Project Effectiveness

Causes of Project Effectiveness	Orthogonal Factor Loadings			
	1 Implementation	2 Maintenance	3 Demand	4 Authoritarianism
1. Coordination success	.83	.19	.25	-.16
2. Scheduling success	.82	.29	.11	-.14
3. Amount of red tape	-.72	-.04	.04	.43
4. Understanding between agencies	.70	.27	.31	-.11
5. Quality of implementation	.64	.31	.30	-.18
6. Understanding with the public	.57	.24	.35	-.16
7. Continuity of personnel	.55	-.04	-.07	-.03
8. Skill and motivation of personnel	.52	.34	.33	-.26
9. Long term maintenance	.10	.84	.16	-.10
10. Short term maintenance	.15	.79	.31	.03
11. Availability of parts	.18	.70	.03	-.10
12. Local servicing of equipment	.23	.65	.23	-.00
13. Local resources	.20	.61	.04	.06
14. Host country GNP per capita	.19	.53	-.02	-.28
15. Skill and resources of beneficiaries	.16	.48	.54	-.08
16. Motivation of beneficiaries to benefit	.13	.13	.78	-.20
17. Favorable market factors	.10	.03	.75	.08
18. Desirability of service to beneficiaries	.06	.09	.73	-.27
19. Favorable local values	.06	.25	.57	-.31
20. Discretion of personnel	.11	.05	.19	-.81
21. Managers' authoritarianism	-.30	.04	-.03	.79
22. Centralization of project	.03	-.01	-.05	.68
23. Self motivation of beneficiary organization	-.11	.09	.22	-.47
24. Correlation with overall effectiveness	.35	.31	.48	-.16

individual variables. The second lesson is the fact that these four factors are distinguished from each other (even though they are also related as observed above). Therefore, they constitute four separate concerns for development planners and managers. Successful provision of one of these factors does not guarantee the successful provision of the other factors. The third lesson is that host country GNP per capita level is most highly loaded on the maintenance factor. Greater societal capacity tends to improve implementation quality and to lower authoritarianism, but it has its major impact on the quality of maintenance. It seems as though the importance of maintenance is better understood in the more developed third world countries and the resources for maintenance are provided more often. This is due in part to a greater capacity to provide the skills and resources locally.

The remaining six factors are of secondary importance but contain some interesting findings. The fifth factor is the AID factor. AID involvement in design, monitoring and advising have loadings on this factor of .83, .90, and .89 respectively. The interesting finding for this factor is the discovery of the variables with the next highest loadings on the AID factor. These variables are favorable local context (.30), favorable relations with the public (.29), GNP per capita (-.27) and project centralization (-.24). These loadings suggest that a strong AID influence on a project tends to increase the project fit with the local context, improve relations with the public and reduce project centralization. These influences are ones which AID has been seeking to have and these loadings, though they are not high, suggest that AID is somewhat succeeding. We also observe that AID's role seems to be more active in the worse off recipient countries.

The sixth factor is the participation factor. Participation in design, implementation and maintenance load on this factor at .78, .57 and .61 respectively and the degree of organization of benficiaries for participaton at .78. Also loaded on this factor but at modest levels are local availability of parts, service for equipment and resources and favorable relations with the public. What is interesting about this factor is its isolation from other factors. Little else loads on it and the participation variables which load on it do not load even moderately on other factors except on factor eight, the decentralization factor. This pattern of isolation suggests that participation is not a regular component of good implementation, good maintenance, high demand, etc.

The seventh factor is the macro context factor. The three variables with the highest loadings are conducive macro events (.77), conducive economic and trade policies (.74), GNP per capital (.46) and conducive market factors (.35). It is pretty much unrelated to other variables except for the three variables: local parts, local servicing of equipment and local resources. These variables inexplicably load on this factor at moderate levels. We tentatively conclude that the macro factor is related to the meso and micro factors of this study in unsystematic ways.

The eighth factor is the decentralization factor since ministry centralization loads at -.81 and project centralization at -.46. Decentralization, not surprisingly, encourages participation as reflected in the loadings on this factor by public participation in maintenance (.52), public participation in implementation (.32) and local servicing of equipment (.33). It is also interesting that adequate financing loads highest on this factor (.41).

The ninth factor is not noteworthy and the tenth factor is noteworthy

mainly for having only two variables related to it. Host country commitment loads at .79 and size of budget at .77. What is interesting is the fact that host country commitment and size of budget are not strongly related to project effectiveness or to most of the major causes of project effectiveness.

SPECIAL ISSUES

The data analysis to this point is directed toward explaining overall effectiveness and learning from the clusterings of variables how the various factors relate to each other. In this section we seek to understand the role of five factors: implementation, maintenance, demand, participation and authoritarianism. The factor analysis identifies each of them as distinct factors, and the correlation analysis indicates that implementation, maintenance and demand are crucial to project effectiveness but participation and authoritarianism are much less important. In this section we examine what factors influence implementation, maintenance and demand and then seek to specify the conditions under which participation and authoritarianism have their greatest impacts on overall effectiveness.

Table 6 presents the zero-order correlations of the independent variables with quality of implementation, desirability of project services to beneficiaries, and long term maintenance. The three sets of correlations will be discussed in order.

What makes for quality implementation? Since the original reports did not carefully examine management factors, our study is quite limited in addressing this question. Nevertheless, some tentative suggestions can be made. Quality implementation is a characteristic of the project organization which helps it produce quality outputs for which there is a demand and which produce positive higher order impacts. Factors contributing to quality implementation are likely to come from four sources (see Figure 1): other characteristics of the project organization, inputs, the context and the sponsoring organizations.

Table 6 suggests that the input of skilled and motivated personnel is the key factor contributing to quality implementation. The other input

Table 6. Zero Order Correlations of Implementation, Demand and Maintenance with the other Causes of Project Effectiveness for 52 AID Projects

Independent Variable	Quality Implementation	Desirability of Project Services	Long Term Maintenance
1. Understanding between agencies	.77	.43	.49
2. Understanding with the public	.77	.56	.37
3. Quality of implementation	-	.55	.51
4. Scheduling success	.78	.26	.39
5. Coordination success	.84	.39	.36
6. Red tape	.52	-.17	-.15
7. Managers' authoritarianism	.32	-.28	-.01
8. Personnel continuity	.59	.26	.20
9. Personnel discretion	.39	.41	.23
10. Skill and motivation of implementors	87	.53	.52
11. Motivation of beneficiaries	55	.88	.29
12. Skill and resources of beneficiaries	60	.61	.60
13. Desirability of project service	.55	-	.32
14. Short term maintenance	.55	.38	.90
15. Long term maintenance	.51	.32	-
16. Adequacy of financing	.53	.47	.51
17. Availability of parts	.51	.27	.60
18. Equipment servicing	.61	.37	.58
19. Local resources	.54	.33	.51
20. Centralization of project	-.35	-.36	-.12
21. Participation in design	.30	.24	-.06
22. Participation in implementation	.38	.28	-.05
23. Self-motivated organization of beneficiaries	.23	.38	.15
24. Host country commitment	.40	.39	.35
25. AID involvement in monitoring	.25	.32	.05
26. Conducive market factors	.40	.57	.23
27. Conducive macro events	.34	.24	.27
28. Fit with local values	.45	.64	.29
29. GNP per capita	.34	.16	.48

Note: independent variables with no correlation with the three dependent variables exceeding .30 are excluded from this table.

variable, adequacy of financing, seems to make a more modest contribution to quality implemenation as do contextual factors and activities of the sponsoring organization (AID involvement).

Many of the high correlations of quality implementation in Table 6 are with other implementation variables such as scheduling success or with variables such as understanding between agencies and understanding with the public which are the results of quality implementation. Finally, it is worth noting that surprisingly managers' authoritarianism, project decentralization and personnel discretion are not strongly related with quality implementation. In sum, quality implementation seems to be largely the result of quality of personnel and secondarily of organizational factors. This conclusion is tentative, however, because some of the variables essential to it are missing or poorly measured in these reports.

What contributes to making the project service desirable to the beneficiaries? According to Table 6 there are no major contributing factors identified in this study. Desirability correlates highly mainly with variables which significantly overlap with it, that is, motivation of beneficiaries, resources of beneficiaries, conducive market factors and fit with local values. Nevertheless, developers should pay attention to these variables. Project plans should take into account the ability of beneficiaries to use the service, their motivation to utilize that type of service, the predisposition of local values toward that type of service and how conducive market factors are. If the first three variables are lacking, then perhaps they could be stimulated. If not, then perhaps the project should be changed. The last factor probably cannot be changed significantly but must be adjusted to.

We also note from Table 6 that desirability correlates fairly highly

with quality implementation, quality of workers, and understanding with the public. A principle guiding good implementation, of course, is to provide a valuable service. Finally, good relations with the public are essential for good service to the public, so public relations should be a major concern in the development field.

What factors contribute to long term maintenance? Again no major contributing factor is identified in Table 6. Moderately important contributing factors, however, seem to be quality implemention, quality implementors, understanding between agencies, adequate financing, GNP per capita, capabilities of beneficiaries, availability of parts, serviceability of equipment and local availability of resources. We interpret these results as indicating the importance of appropriate technology, good management, adequate resources and skills available in the local community for good maintenance.

Next we examine the role of participation and authoritarianism in the functioning of these 52 AID projects. Participation refers to the active involvement of the public or beneficiaries in the design, implementation, or maintenance of the project, and authoritarianism refers to a centralized and hierarchical structure of the project and authoritarian style of its management. Both the participation and authoritarian variables have only modest negative correlations with overall effectiveness as seen in Table 3. The highest correlation with project effectiveness for a participation variable is $r = .42$ and for an authoritarianism variable $r = -.44$.

The modest or low correlations of participation and authoritarianism with project effectiveness could occur in two very different ways. First, these factors may have a modest influence throughout the set of 52 projects. Second, they may have substantial influence in certain types of

projects and no influence in other types of projects resulting in a modest average influence in all projects taken together. We hypothesize that the second situation obtains for participation and authoritarianism.

In Table 7 we subdivide the projects by GNP per capita and again by basic types of projects in order to test two hypotheses about variable effects of participation and authoritarianism on project effectiveness. First, both participation and non-authoritarianism contribute more to project effectiveness in the more developed third world countries than in the less developed third world countries. Our reasoning is that the less developed societies are more used to authoritarianism and public passivity. Workers may be uncomfortable with wide discretion and publics may have little experience in active participation. Lower strata dependency may be more normal in the least developed countries.

The second hypothesis is that the lack of participation and authoritarianism may have little negative effects in projects which are largely matters of engineering and have more negative effects in projects which involve more direct services to the people. This hypothesis derives from the organizational literature. To test this hypothesis we divide projects into roads and electrification as largely engineering projects; housing, health, nutrition, education and general development as largely human service projects and irrigation, potable water and agricultural research as somewhat of a mixture.

Table 7 supports the first hypothesis for participation but not authoritarianism. The participation variables are identified with a (P) and the authoritarianism variables with a (A). The correlations for subgroups which increase or decrease with levels of GNP per capita at least .20 points and at least .5 per step are underlined. The four core particips-

Table 7. Correlations of Overall Effectiveness with the Independent Variables for Groupings by GNP per Capita and by Type of Project

Independent Variable	GNP per Capita in Dollars			Project Type		
	0-$499	$500-$999	$1000+	Roads & Electri-fication	Irrigation Water and Ag. Research	Housing, E Health an General Developmen
1. Understanding between agencies	.53	.64	.67	.61	.59	.79
2. Understanding with public (P)	.54	.65	.74	.65	.64	.75
3. Quality of implementation	.79	.83	.85	.77	.85	.93
4. Scheduling success	.46	.45	.47	.42	.58	.58
5. Coordination success	.59	.69	.47	.61	.64	.69
6. Red tape (A)	-.02	-.43	-.49	-.26	-.52	.14
7. Managers' authoritarianism (A)	-.15	-.54	-.14	-.44	-.35	.20
8. Personnel continuity	.42	.65	.15	.22	58	.57
9. Personnel discretion (A)	.29	.70	.21	.42	53	.28
10. Skill and motivation	.64	.79	.76	.56	87	.77
11. Beneficiaries' motivation	.38	.65	.87	.79	72	.53
12. Beneficiaries' skill	.69	.68	.69	.70	84	.52
13. Desirability of service	.53	.77	.93	.77	73	.72
14. Short term maintenance	.74	.21	.62	.69	.61	.48
15. Long term maintenance	.72	.12	.58	.50	.62	.51
16. Adequacy of financing	.51	.59	.52	.75	.70	.35
17. Availability of parts	.15	.30	.53	.69	.47	.26
18. Equipment servicing	.39	.53	.65	.74	.67	.43
19. Local resources	.60	.39	.54	.75	54	.53
20. Ministry centralization (A)	-.41	-.19	-.07	-.55	-.27	-.01
21. Project centralization (A)	-.34	-.39	-.39	-.56	-.50	.01
22. Participation in design (P)	-.21	.32	.22	.33	.20	.19
23. Participation in implementation (P)	.08	.54	.62	.20	.77	.19
24. Participation in maintenance (P)	.18	.31	.41	.08	.54	.17
25. Organization of beneficiaries(P)	-.21	.10	.60	.48	.43	-.15
26. Self motivated organization (P)	.10	.51	.25	.20	.15	59
27. Part of continuous program	-.05	.17	.45	.18	.13	35
28. Host country commitment	.24	.31	.40	-.04	.56	31
29. AID help design	.39	.10	.46	.44	.46	30
30. AID monitor	.47	.37	.42	.15	.48	17
31. AID advise	.39	.40	.38	.08	.46	23
32. Favorable economic policies	-.17	.02	.27	.38	.27	02
33. Favorable market factors	.58	.64	.58	.62	.63	.28
34. Favorable macro events	.39	.07	.39	.32	.27	.53
35. Favorable local values (P)	.17	.50	.69	.74	.55	.40
Mean score on effectiveness	4.61	5.59	6.65	5.54	5.50	5.76
Standard deviation	2.17	2.49	2.48	2.74	2.60	2.24
Number of cases	18	17	17	13	22	17

tion variables are participation in design, implementation and maintenance and organization of beneficiaries for participation. Three of these become progressively more positive with each step in host country GNP per capita, and the fourth comes close to this pattern. The three variables which less accurately represent participation are understanding with the public, self motivated organization of beneficiaries and favorable local values. Two of these are increasingly positive with each step in GNP per capita. In sum, public participation in projects seems to make little or no contribution to project effectiveness for projects taking place in the poorest countries but becomes increasingly important the more developed the country is.

Only two out of five authoritarianism variables have the hypothesized patterns of correlations. Two of the other three have negligible correlations with effectiveness among the poorest countries and much larger correlations in the next income level countries, but then have low correlations in the higher income countries. The hypothesis that authoritarianism is increasingly detrimental to project effectiveness with increasing per capital income levels receives mild support but is not confirmed in this study.

Table 7 refutes the second hypothesis about the differential impacts of participation and authoritarianism on effectiveness in different types of projects. We expect lack of participation and authoritarianism to have minimum adverse effects in the engineering projects (roads and electrification) and maximum adverse effects in the human service projects. To our surprise the opposite pattern obtains for managers' authoritarianism. both ministry and project centralization, organization of beneficiaries and favorable local values.

Though Table 7 refutes our specific hypothesis about differential effects of variables on project effectiveness for different types of pro-

jects, nevertheless it does demonstrate that specific types of projects have unique patterns of interactions among independent variables. This suggests the need to study respectible samples of projects of various types to sharpen our knowledge of the workings of development projects beyond the general findings presented in this study.

APPENDIX A

EXPLANATION OF SCALES USED IN PROJECT SCORING SHEET FOR DEVELOPMENT PROJECTS

GENERAL NOTE: Most scores are indicated on 7 point scales with 1=low, 7=high, and 4=average. The project is to be compared to the average project of its type. The scores for the consequences of the project are for the cumulation of consequences up to the time of the evaluation.

6-8 Project purposes involve the creation of facilities, training, technology, and organization (factors of production) in order to produce goods, services, and benefits. Try to identify purposes in terms of the production derived from the factors of production as in 9D.

9A1 Was the project effective in building facilities (5-7), just average (4) or relatively ineffective (1-3).

9A2-4 Was the project effective in training, transfering technology, or creating and sustaining organizations (5-7), average (4) or ineffective (1-3).

9B Normally road, irrigation, and electrification projects emphasize facilities, education projects emphasize training, ag. research projects emphasize technology and health or nutrition projects emphasize organization.

9C Are the facilities being maintained, training continuing or trained personnel staying at the job, technology being adapted or organizations surviving and growing?

9D Are the facilities, education, technology, and organization being heavily used and thus producing much goods and services, i.e. much transportation, water, electricity, ag. production, health service, etc.?

9E Is the increased production increasing incomes and creating other benefits, e.g., saving time for leisure, enabling children to go to school, etc.?

9F Are the factors heavily and effectively used to produce benefits?

9G Are domestic businesses hired to implement the project and do entrepeneurs arise to take advantage of opportunities created by the completed project, e.g.,commercial truck and bus activity along a new road?

10B Social costs include displacement, family disruption, increased indebtedness, loss of land, community conflict or disruption, etc.

11 Inequalities refer to income distribution between the rich and poor. The poor include landless or tennant farmers and owners of small farms.

12 What is your prediction about the future prospects for the project results?

13 Include all previous dimensions (6-13) and others you may wish to add in an overall evaluation of the success or failure of the project. Please discuss your judgement.

17 The involved agencies include the donors, the responsible government agencies and the contractors. The public usualy includes beneficiaries and local leaders.

18A Consider problems of delays and bad timing.

18B Coordination applies not only to the process of creating the factors of production but also to the management of the facilities or organizations thusly created.

18C Bureaucratic red tape applies both to the organization implementing the project and to the relations between this organization and the government agency which authorizes and oversees the project.

18D-G These questions apply to the implementing organization.

19 Maintenance refers only to facilities constructed by the project.

20 Was any failure due to insufficient funds?

21 Equipment refers to equipment which is an aspect of the project or related to it in any way, e.g., pumps for wells, gates for irrigation canals, transformers for electrical utilities, jeeps for mobile medical units, research equipment for research centers.

22 Resources would include fuel for electrical utilities, fertilizers for

newly created plant varieties, brick or cement for building materials, etc. Leave blank if this question is not relevant.

23 Is activity initiated, planned, directed, controlled and executed at the national level (7) or the local level (1)? When project direction is shared between local and other levels, middle scores are appropriate.

24 This variable involves both the fact of consultation at the local level and also the extent to which local inputs are heeded or used.

27 At one extreme is a one shot program. At the other extreme is a project which funds what is or becomes a normal function of a permanent agency.

28 When commitment varies over time use an average.

30 Government policies which specifically deal with the project are not included here.

32 Macro events might include war or civil strife or a major government project which draws government time and resources away from the project.

PROJECT EVALUATION CODE SHEET

		Col.	Code	Confidence Score
1. Project Name _____	Number	1-3		
2. Project Location _____	Region	4		
3. Project Dates a) beginning _____	19xx	5,6		
b) ending _____	19xx	7,8		
4. Project Type _____		9		
5. Number of Impacted Communities: 1=1,2=2-5,3=6-20,4=21-100,5=100+		10		

PROJECT CONSEQUENCES

6. Project Purposes _____

7. Indicators of Purposes _____

8. Degree of Attainment of Purposes: 1=0-24%, 2=25-49%, 3=50-74%, 4=75-100%, 5=100+% — 12 _____

9. Benefits

A. Direct Outputs of the project (factors of production)

1) Amount of facilities constructed	1 2 3:4:5 6 7	13	
2) Amount of training or occupational education	1 2 3:4:5 6 7	14	
3) Amount of technology developed or adopted	1 2 3:4:5 6 7	15	
4) Amount of organizational development	1 2 3:4:5 6 7	16	
5) Amount of all outputs taken together	1 2 3:4:5 6 7	17	
B. Which of the above factors is emphasized by the project?	1 2 3 4	18	
C. Estimation of long term (10 years) continuation of the emphasized factor of production	1 2 3:4:5 6 7	19	
D. Amount of increased production derived from the above factors. Describe _____	1 2 3:4:5 6 7	20	
E. Secondary benefits of the increased production to families and individuals (multiplier effects): total	1 2 3:4:5 6 7	21	
1) Family income benefits _____	1 2 3:4:5 6 7	22	
2) Social benefits. Describe _____	1 2 3:4:5 6 7	23	
3) Other secondary benefits of production to families & individuals. Describe _____			
F. Productivity of the factors of production (amount of use of the factors or the amount of production & other benefits from the factors) _____	1 2 3:4:5 6 7	24	
G. Domestic private sector development			
1) Directly as implementors of the project	1 2 3:4:5 6 7	25	
Describe _____			
2) Indirectly as a consequence of the project	1 2 3:4:5 6 7	26	
Describe _____			

10. Costs

A. Economic costs

1) Total costs in thousands of U.S. dollars		Col. 28-33	
2) Budget breakdown _____			
3) Sources of Funds _____			
4) Estimate how positive or negative a standard benefit/cost analysis would come out _____	-3-2-1:0:1+2+3	34	

	low av. high	Col	Cod	Confidence
B. Amount of social costs (negative social impacts) Describe	1 2 3:4:5 6 7	35		
C. Environmental costs. Describe	1 2 3:4:5 6 7	36		
11. Extent inequalities were widened (+) or diminished (-) by the project. Describe	-3-2-1:0:1+2+3	37		
12. Net future project benefits compared to net future project costs	1 2 3:4:5 6 7	38		
13. Project effectiveness (total benefits/costs score) Scale 0-10 from very low to very high 0 1 2 3 4:5:6 7 8 9 10 Discuss		39,40		

IMPLEMENTATION

14. Name of Organizations Sponsoring Project
15. Name of Organizations Implementing Project
16. What Type of Organization Is the Lead Implementing Organization? 1= national gov. agency, 2=regional gov. agency, 3=local gov. agency, 4=foreign gov. agency, 5=private enterprise, 6=foreign NGO, 7=national NGO, 8=other 41

	low av. high	Col	Cod	Confidence
17. Understanding and Communication				
A. Between involved agencies. Describe	1 2 3:4:5 6 7	42		
B. Between involved agencies & the public. Describe	1 2 3:4:5 6 7	43		
18. Quality of Implementation of Project: Overall	1 2 3:4:5 6 7	44		
A. Schedule & timing success	1 2 3:4:5 6 7	45		
Describe problems				
B. Coordination success	1 2 3:4:5 6 7	46		
Describe problems				
C. Extent of bureaucratic red tape	1 2 3:4:5 6 7	47		
D. Degree of authoritarian style of top management	1 2 3:4:5 6 7	48		
E. Degree of continuity of key project personnel	1 2 3:4:5 6 7	49		
F. Degree of discression of project leaders and key personnel	1 2 3:4:5 6 7	50		
G. Skill, capabilities, & motivation of the implementors Discuss	1 2 3:4:5 6 7	51		
H. Motivation of beneficiaries to participate if relevant. Discuss	1 2 3:4:5 6 7	52		
I. Adequacy of the skill, knowledge or resources of the beneficiaries if relevant	1 2 3:4:5 6 7	53		
J. Desireability of the goods, services or benefits of the project to the beneficiaries. Discuss	1 2 3:4:5 6 7	54		
19. Maintenance of Constructed Facilities				
A. Up to two years after project	1 2 3:4:5 6 7	55		
B. After two years	1 2 3:4:5 6 7	56		
Discussion				
20. Adequacy of Financing. Specify inadequacies	1 2 3:4:5 6 7	57		
21. Sustainability of equipment				
A. Availability of parts & replacements	1 2 3:4:5 6 7	58		
B. Extent equipment can be maintained by local technicians	1 2 3:4:5 6 7	59		
22. Local Availability of Resources	1 2 3:4:5 6 7	60		

	low av. high	Col	Cod	Confidence
23. Degree of Centralization				
A. Of the responsible government agency if relevant	1 2 3:4:5 6 7	61		
B. Of the project itself	1 2 3:4:5 6 7	62		
24. Degree of Participation by Beneficiaries (or public)				
A. In project design	1 2 3:4:5 6 7	63		
B. In project implementation	1 2 3:4:5 6 7	64		
C. In project maintenance	1 2 3:4:5 6 7	65		
Discussion				
25. (If relevant) The extent beneficiaries organized for their role in the project?	1 2 3:4:5 6 7	66		
26. (If relevant) The extent participation of beneficiaries arose out of their own desire to participate as opposed to engineered participation	1 2 3:4:5 6 7	67		

LARGER CONTEXT

27. Part of Continuous Program: 0=not, 1=partly, 2=entirely	0 1 2	69		
28. Host Country Commitment	1 2 3:4:5 6 7	70		
29. Extent or Influence of AID's Participation				
A. In designing the project	1 2 3:4:5 6 7	71		
B. In monitoring the project	1 2 3:4:5 6 7	72		
C. In advising the project	1 2 3:4:5 6 7	73		

NOTE: For the following questions use a scale ranging from -3=exceptionally negative to +3=exceptionally positive with 0=neutral

	- 0 +			
30. Effect of Host Country Economic and Trade Policies on Project Success. Discuss	-3-2-1:0:1+2+3	74		
31. Effect of Market Factors on Project Success	-3-2-1:0:1+2+3	75		
Discuss				
32. Effect of Other Macro Events on Project Success	-3-2-1:0:1+2+3	76		
Discuss				
33. Effect of Local Values & Social Structures on Project Success. Discuss	-3-2-1:0:1+2+3	77		

COMMENTS

APPENDIX B: LIST OF PROJECTS

PROJECT IMPACT EVALUATIONS

1. Colombia: Small Farmer Market Access
2. Kitale Maize: The Limits of Success
3. The Potable Water Project in Rural Thailand
4. Philippine Small Scale Irrigation
5. Kenya Rural Water Supply: Program, Progress spects
6. Impact of Rural Roads in Liberia
7. Effectiveness and Impact of the CARE/Sierra Leone Rural Penetration Roads Projects
8. Morocco: Food Aid and Nutrition Education
9. Senegal: The Sine Saloum Rural Health Care Project
10. Tunisia: CARE Water Projects
11. Jamaica Feeder Roads: An Evaluation
12. Korean Irrigation
13. Rural Roads in Thailand
14. Central America: Small Farmer Cropping Systems
15. The Philippines: Rural Electrification
16. Bolivia: Rural Electrification
17. Honduras Rural Roads: Old Directions and New
    A. Old Project
    B. New Project
18. Philippines Rural Roads I and II
19. U.S. Aid to Education to Nepal: A 20-Year Beginning
20. Korean Potable Water System Project: Lessons from Experience
21. Ecuador: Rural Electrification
22. The Product is Progress: Rural Electrification in Costa Rica

23. Northern Nigeria Teacher Educational Project

24. Peru: CARE OPG Water Health Services Project

25. Thailand: Rural NonFormal Education - The Mobile Trade Training Schools

26. Kenya: Rural Roads

27. Korean Agricultural Research: The Integration of Research and Extension

28. Philippines: Bicol Integrated Area Development

29. Sederhana: Indonesia a Small-Scale Irrigation

30. Guatemala: Development of ICTA and Its Impact on Agricultural Research and Farm Productivity

31. Sudan: The Rahad Irrigation Project

32. Panama: Rural Water

33. Food Grain Technology: Agricultural Research in Nepal

34. Agricultural Research in Northeastern Thailand

35. The On-Farm Water Management Project in Pakistan

36. Korea Health Demonstration Project

37. Radio Correspondence Education in Kenya

38. A Low-Cost Alternative For Universal Primary Education In The Phillipines

39. Not used

40. Not used

41. Housing Guaranty Programs in Panama

42. Bangladesh Small-Scale Irrigation

43. Egypt: The Egyptian American Rural Improvement Service, A Point Four Project, 1952-63.
    A. Abis settlement
    B. Qoota and Kom Osheim settlements

44. West African Rice Research and Development
    A. Mangrove Swamp Rice Research Station: Sierra Leone
    B. Deepwater/Floating Rice Research Station Institute: Mali

45. Not used

46. U.S. Aid to Education in Paraguay: The Rural Education Development Project

47. Not used

48. Tunesia: The Wheat Development Program

49. Haiti: Hacho Rural Community Development

50. On-Farm Water Management In Agean Turkey, 1968-74

5X. Bolivia: Integrated Rural Development in a Colonization Setting
   A. Chane - Piray Settlement
   B. San Julian Settlement

5X. Korean Agricultural Services: The Invisible Hand in the Iron Glove: Market and Non-Market Forces in Korean Rural Development