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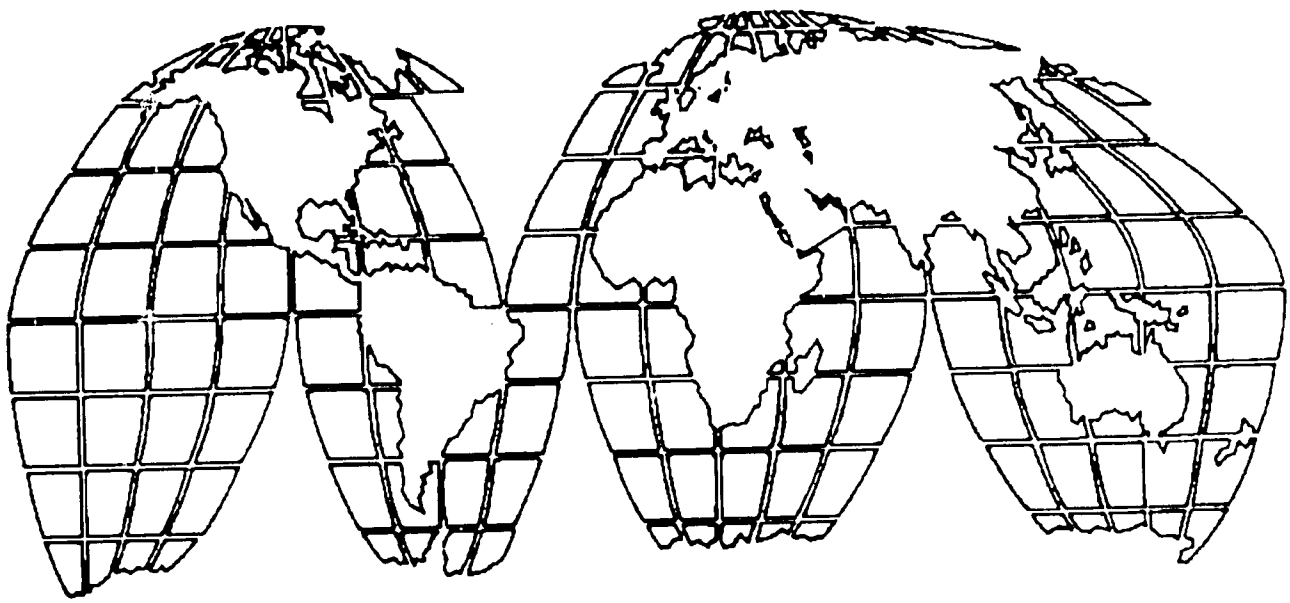
Institution Building to Improve Agricultural Research and Education: Lessons Learned From Evaluations



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INSTITUTION BUILDING TO IMPROVE AGRICULTURAL RESEARCH AND EDUCATION: LESSONS LEARNED FROM EVALUATIONS

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EXECUTIVE SUMMARY

AID's assistance on behalf of agricultural research and teaching tries both to improve the substance of research and training and to build an institutional capacity. Evaluations of these efforts point to a number of successes but also explain why building institutions to pursue relevant research and training is generally a low priority within the Third World. The role of institutions doing agricultural research and training has changed considerably. Currently, observers emphasize that increasing agricultural production depends less on technological breakthroughs than on support from political and socio-economic factors, such as government pricing policies and the responsiveness of smallholder farmers. The most important social and economic issue confronting agricultural institutions is the need to make research and training relevant to farmers. The institutional issue is whether the institutions are providing training and research that address the actual constraints that farmers face.

Evaluations note that many institutions have had a positive impact on agricultural productivity, especially when there is strong administrative leadership; the institution has a sense of purpose and mission; there are close linkages between training, research and extension services to farmers; a multidisciplinary emphasis; incentives for faculty to emphasize farming systems; supportive economic pricing policies; adequate inputs and services. However, institutions have a hard time fulfilling these conditions. Universities emphasize disciplinary boundaries. It is logistically difficult to tailor research to farmers' immediate concerns. Political leaders tend to pursue policies that benefit urban consumers rather than rural producers and favor short term benefits. Governments lack resources to provide sufficient inputs and services. Ministries make it difficult for research and extension work to support each other.

Because of these difficulties, such institutions depend on long-term support from external organizations. Donors, however, also find it difficult to provide assistance for activities where the benefits are only apparent in the long run. AID usually contracts with a U.S. university to establish a long term relationship with a Third World institution and provide it with technical assistance (TA) and participant training. Many of these activities have been successful in building an institutional capacity, particularly when the assistance continues for a long time. Because it is difficult to build lasting and relevant institutions, however, AID should design its project assistance to deal with the constraints described earlier, such as encouraging universities to reward faculty for farming systems research, and developing linkages among those doing research, teaching and extension work.

I. Institution Building to Improve Agricultural Research and Education

AID has a long interest in developing and strengthening institutions to improve agricultural production in developing nations. (See AID Policy Paper, 1982). This study draws on the Agency's experiences in assisting agricultural training and research institutions to determine the lessons for institutional development in general and to compare the relative merits of different forms of technical assistance. It is based on a series of evaluations conducted over the past ten years that examined the Agency's assistance to agricultural research institutes, colleges and universities. The assistance had the dual purposes of improving the substance of research and training and also of building an institutional capacity to carry out research and training after the assistance was completed. Sixteen individual evaluations and two reviews of a series of evaluations were studied. (See Appendices A and B.) The analysis focuses on two broad questions. Part One asks what the studies tell us about the conditions for building effective and sustainable institutions and Part Two asks about the relative merits of various forms of technical assistance.

The review is being done at a time when Third World nations are facing declining economies and increased demands for food production. Most of the countries are experiencing important changes within their agricultural sectors, priorities are shifting, and new policies are being proposed. At the same time fewer resources are being devoted to agricultural research and the institutions that exist are facing increasing demands on their expertise and services. The evaluations point to a number of positive results from former assistance to research and training institutions. They also underscore that most benefits are only evident in the long run and that there are few political payoffs for investing in research in particular. The major value of the evaluations lies in their analysis of the long term structural problems o constraints in building stronger sustainable institutions for research and teaching.

II. Institution Building

A. Agricultural Research and Training Institutions and Criteria for Institution Building.

"Institution building" refers to improvements in the capacity of the institutions to perform their training and research functions more effectively. The definition of effective performance, however, has changed considerably over the decades.

In the 1950s observers assumed that existing agricultural technology was adequate and that developing countries primarily needed institutions to disseminate state of the art technology to farmers. The major emphasis was on designing an institutional capacity for training local staff of agricultural ministries and for doing effective extension work. There was less emphasis on research itself. As a result foreign aid went to building colleges and universities and focused on teaching and curriculum development. The 1960s saw a greater emphasis on training in applied research to develop new technology such as high yielding varieties of seed. Institution building came to mean building a greater technical competence in these countries to do research and to adapt agricultural technology developed in the west and in international research organizations. During the 1970s there was a greater emphasis on rural development and service delivery in rural areas. This meant less emphasis on innovative research and more interest in institutions that could meet basic human needs and carry out "quick impact" projects (Review, 1982, 23-27).

By the end of the 1970s, however, those concerned with agriculture were thinking about a broader set of issues. It became clear that agricultural production was not merely dependent on technological breakthroughs. Rather it depended on support from political and socio-economic factors, such as government policies, changing preferences and the responsiveness of smallholder farmers. In the words of one review, "the key difficulties in increasing food production are not solely agricultural or technical, but lie in political, socio-economic, and managerial constraints that influence the research system on the one hand, and the adoption of research findings on the other" (Review, 1983, 18). As a result institutions are needed that can take this setting into account -- both to influence it and learn from it.

This new perspective on institutions is illustrated by the study of agricultural universities in India. The authors stressed the need for institutions that could cope with new technologies, emerging problems and changing demands. New technology is making many commodities interchangeable in the world agricultural market for the first time. There is a growing interest in environmental and conservation issues. Governments no longer think of agriculture as a way to increase food production, but are increasingly concerned with its impact on unemployment. There is a growing concern for diversifying and improving diets and developing new processing technologies (India, 1988, 2). Given these and other changes, institution building poses new questions. Is financial and technical assistance enabling institutions to deal creatively with these problems? Are the institutes and universities developing a "process of examining [their] purposes and missions in light of an ever-changing socioeconomic and technical environment?" Are they building a capacity, not only to respond to such changes, but to shape and

influence what goes on in their settings (India, 1988, viii-xiv)?

The review of institutions in Nigeria also emphasizes the need for institutions that can cope with changing demands and conditions. African countries, in particular, cannot import as much as before and are having to produce more of their own food. In Nigeria, as elsewhere, the public sector has a greatly reduced demand for graduates with agricultural training. At the same time there is an increase in the number of commercial farmers who will not be as dependent on government services as small farmers are and who will be in a better position to respond to private sources of agricultural inputs. There is a need for institutions that can adjust to this changing environment, and for schools that can adapt their training to the new demands (Nigeria, 1988, 14 and App. D; See also Malawi, 1987).

The most important social and economic issue confronting agricultural institutions is the need to make their research and training relevant to farmers. Farmers face constraints that determine whether or not they adopt new technology. Research and training, therefore, need to take into account the total farming system and consider the range of actual problems and choices that confront farmers. Effective institutions, in this context, are those with an ability "to develop technology applicable to the needs of farmers under adverse environmental conditions," (Review, 1982, 1). This concern influences the criteria for effective institutions. Are the universities training agricultural specialists who are atune to farming practice? Are the institutions pursuing research that take these same realities into account? The next section reviews the impacts the studies looked for to answer these questions.

B. Results of Assistance Related to Institution Building

1. Relevance of Training and Research to Farming Conditions

Have universities and research institutes altered the content of their training and research to emphasize appropriate technology and the actual choices facing farmers? The 1982 Review of evaluations noted a general "shift towards conducting research under adverse conditions and testing for characteristics other than high crop yield." It also found "an increasing attempt to design technology for more resource poor areas" (Review 1982, 12-13). As a result institutions were using a different methodology of research: "A greater amount of research is adaptive, and is being conducted on small farms. Communication among the researchers, extension agents, and farmers has been increasing. Agricultural research is becoming more holistic, with a wider variety of disciplines becoming involved in the identification of small farmer production constraints" (Review, 1982, 13-14; see

also Review, 1983, 7).

A number of the studies ask whether curricula encourage a problem solving approach to agriculture as opposed to prepackaged solutions or technologies. A study of the Bogor Institute in Indonesia found that employees were doing innovative work with farmers in villages, were encouraging student field work in rural areas, and were experimenting with different forms of extension. The Institute had developed a variety of services to local communities and was helping constituencies not ordinarily served by a university. They had sponsored two experiments to bring about change in rural areas, and were successfully using action research to monitor and learn from the experiments (Indonesia, 1988, 13-21; see also Ethiopia 1988).

Another question raised is whether the institute or university is willing to review its role and respond to new demands in its environment. For example, a university in Thailand was originally set up to train manpower for agricultural development agencies. Currently it is trying to expand its mission and respond to new demands for specialists in international trade and competition and the interests of private enterprise (Thailand, 1988). Some of the Indian schools, by contrast, while they are emphasizing appropriate technology, have not been as flexible or open to change. The evaluators feel the schools need to redefine their role to focus even more on rural development than they have and develop more innovative curricula that include social science, market research and management courses (India, 1988, xiii).

2. Impact on Agricultural Productivity in Country

A second result concerns the impact of the assisted research and education on agricultural productivity. The studies listed a number of new and improved varieties of commodities that had been developed and the rate of their adoption by the farming community. A few were able to link the new technology to increases in agricultural productivity. One institute, for example, had a very strong record in improving maize production, in developing an active market in tropical fruits, and in identifying new high quality protein sources (Thailand, 1982). The study of Indian agricultural universities lists a remarkable set of improvements in agricultural production (India, 1988, xi). The Ethiopian study reported interviews with farmers which identified ways in which the university had been useful to local producers, and documented that improved seed were widely used, that local cooperatives were seeking help from the university, and that some of the new crops they had promoted were now used in local diets (Ethiopia, 1988, 6-7).

Often it was difficult to link new technology and research to actual improvements in productivity. In part this is because

many of the studies were focusing on recent changes and not enough time had elapsed to have a major impact. Another and more important reason, however, is that there are multiple influences on increased productivity. In keeping with the new emphasis on a systems approach to farming the studies stress the fact that farmers' decisions to adopt new technology do not depend solely on the quality or relevance of the research. They also depend on the extent to which the government provides needed inputs such as fertilizer and credit (Review, 1983; Nigeria, 1988, App. C).

3. Impact on Capacity of Universities and Institutes

The studies also asked whether assistance has improved the internal capacity of the universities and institutes. First, they examined changes in enrollment and almost all noted that the institute or university had grown considerably, particularly up until the late 1970s. In examining the makeup of the student body, however, several noted a strong urban bias in the enrollments. Most students continued to come from urban areas, had no first hand experience with farming and no intention of going into farming. Several universities have improved their admissions policies and tried to reduce dropout rates (Indonesia, 1988, 5).

Second, the studies looked at the impact of enrollment increases on the position of faculty. Most stressed the increased demands on the faculty, their large teaching loads and the fact that many faculties are being stretched much too thin to do quality work. By and large the schools and institutes are also providing less in the way of support for faculty, such as faculty development funds or facilities for research and continuing education. There is also a high attrition rate among faculty as many leave to work in the private sector. Third, they looked at the physical capacity of the institutes and universities, and predictably they found a variety of conditions. Some have greatly improved their facilities; in others the facilities are not being maintained and are severely out of date.

4. Impact on the Government's Capacity for Improving Agricultural Production

A fourth impact concerns the effectiveness of the assistance in improving the government's capacity. One indicator is the impact on government staff. Most studies found that the institutes and universities have been very successful in training staff for government agencies involved in agriculture and that there is a continuing demand for their graduates (e.g. Indonesia, 1988). In a number of countries such as Malawi, however, the university has trained all the manpower the government can absorb and it now needs to provide training for other groups.

Another indicator is the role of faculties and university

graduates in contributing to public policy making, serving on public boards and commissions, and stimulating the private sector. The Bogor Institute in Indonesia has been a leader in promoting improved research in other research institutes (Indonesia, 1988, 7-12). Graduates of Kasetsart University in Thailand hold important leadership positions in the government and have begun new industries. The school has also facilitated cooperative research and training activities with international organizations and donors and served as a catalyst and meeting place for regional activities (Thailand, 1988, 22-33). The Indian agricultural schools have produced an impressive scientific establishment, have trained staff for parastatals and private companies, have established regional research centers, have increased the opportunity for women in agriculture, and continue to provide technical support to the state extension services (India, 1988, 15-33).

C. Factors Contributing to the Building of Effective and Sustainable Agricultural Research and Training Institutions.

The evaluations were particularly useful in identifying conditions that seemed to lead to more effective institutional performance -- both conditions that encourage successful institutions and ones that prevent effectiveness. Several went further and analyzed why supporting conditions were often not present. It is one thing to say that institutions need strong leadership and support from the government. It is more useful to analyze why those conditions are often not forthcoming. The burden of the studies is that many of the conditions most important to encourage strong institutions are lacking and are hard to put in place.

1. Sense of Mission and Leadership within Institutions.

A number of the studies stressed the importance of a sense of mission about the role and purposes of the institution. Where a strong sense of purpose was lacking the institutions easily got caught up in short term needs. This emphasis on mission was closely connected to the stress on a broad socio-economic approach to agriculture. Since it is difficult to develop and act on this broader role, institutions are unlikely to be successful unless they have a strong sense of mission and purpose. For example, the strong sense of mission in the Superior Institute of Agriculture in the Dominican Republic was given as a major reason for its strength and effectiveness (Dominican Republic, 1988). The study of the agricultural institute in Morocco attributed its success to its strong commitment to train Moroccans for the agricultural sector and to be relevant to local farming conditions (Morocco, 1987, 19).

By contrast, the study of three universities in Nigeria notes that there is no guiding sense of mission to encourage them

to take a more innovative approach to agriculture or attempt to be more responsive to social needs. "Nigerian professors, even those trained in U.S. land-grant universities and fully capable as scientists, have only a limited understanding of how or why farmers do what they do" and this makes it difficult for them to redefine their own role (Nigeria, 1988, App. C.) The study of the Indian universities found that their research priorities frequently were too narrowly focused on production, and that they needed a clearer understanding that they had a mission to promote development and not train students in agriculture (India, 1988, 45).

This discussion of mission is usually linked to the presence of strong leadership and a core group of administrators with the authority and tenure to plan for the long term. Many of the problems at the Kasetsart Institute in Thailand and its lack of a clear sense of purpose were attributed to the excessive rotation of administrators and the difficulties in doing any long term planning. Like many universities it assumes that academic freedom requires vesting major authority in the faculty rather than the administration. Not only do administrators constantly rotate, but there are few incentives to encourage strong leaders to emerge (Thailand, 1988, 40-51, App. B, 20).

By contrast, the Institute of Agriculture in Morocco has experienced strong and continuous leadership. It has benefitted from a central authority that not only cut across internal departmental divisions, but is able to represent the university effectively to government officials. The study warns, however, that currently charismatic leadership is being replaced by more routinized bureaucratic authority (Morocco, 1987). The experience of universities in India confirm the value of strong, committed leadership. In those schools where administrators have been in office for a number of years, the schools have performed much better than in cases of rapid turnover. They are able both to motivate the faculty with a sense of purpose and establish a better rapport with state leaders. Universities where the leadership has rotated have been much less successful (India, 1988, 45).

Leadership and a strong sense of mission were often linked to decision making procedures and management practices that encourage strategic planning and priority setting. Strategic planning involves establishing priorities, setting realistic objectives, pulling together teams to carry them out, carefully designing the research, and monitoring the results, all as part of an ongoing process (India, 1988, xii, 40). When there are no priorities, researchers typically try to do too much or do not allow enough time to determine results (Review, 1982, 54). Institutions need help in improving their planning and management capacity, however. The study of universities in India noted that the establishment of the National Academy for Agricultural

Research Management (NAARM) to study and improve management at all the universities and research stations was a very positive development (India, 1988, 16).

Leadership and priority setting can be encouraged by an external body with the authority to set goals. For example, a strong national research network can support on-farm research as a priority for institutes throughout the country (Review, 1982, 14). It can also screen research done elsewhere and adapt technology received from international research centers. In 1960, the Indian government developed a prototype, the Agricultural Universities Committee (AUC), which reviewed the plans of each state to develop a university and determine whether they were trying to integrate research, teaching and extension work. The AUC developed a Model Act which was used to guide states in forming and reviewing their universities. India has also developed another example of an effective body for setting priorities and monitoring universities. The Indian Council for Agricultural Research (ICAR) which oversees and coordinates research and sets priorities (India, 1988, 11, 16; Review, 1982, 18-19). ICAR in fact could be even more effective if it concentrated its efforts on the newer and weaker universities, allowing the older ones with an established track record greater autonomy.

2. Linkages Between Training, Research and Extension

Virtually all of the studies emphasized the need for structural linkages between those units in charge of teaching, research and extension work. Linkages are important to make training and research more relevant and to disseminate it effectively. First, training and research organizations are unlikely to emphasize appropriate technology unless they are linked directly with units doing extension work. Extension workers can feed information into the university or research institute and translate farmer needs into researchable topics (India, 1988, xi). Second, linkages with extension services make it easier to disseminate research. Dissemination continues to be a major problem and institutes cannot be relied on to circulate results on their own (Review, 1982, 17; see also Guatemala, 1982, 60). In some cases, institutions had developed informal working relations with other units, but these were unlikely to have a lasting effect on their mission and activities unless the linkages were more formally institutionalized.

Institutional linkages are implicit in the landgrant university model that has informed most of the assistance to agricultural institutions in the past. The problem is that the model does not translate easily to most Third World settings. In the landgrant university model research, teaching and extension work are fully integrated and designed to meet the ongoing needs of the farming community (India, 1988, 9). It was seldom possible

to replicate this model in the Third World, however, where extension work is typically controlled by the Ministry of Agriculture and research and education are assigned to the Ministry of Education.

This division is the case in Malawi, for example. The college has become isolated and the faculty have little involvement in research priorities leaving the college with no constituency or mechanism for being held accountable to the research needs of the country. Technical assistance in Malawi tried to set up accountability mechanisms between the college and the farming community but they were not sustained (Malawi, 1987). In Nigeria there are no linkages between the Ministries of Agriculture and Education which isolates the research institutes from the rest of the agricultural system (Nigeria, 1988, 16-17). The institute in Tunisia was established as a parastatal, and by virtue of this autonomy avoided bureaucratic infighting. This isolation, however, meant that it had no connection with the extension services (Tunisia, 1983). Conversely the state agricultural universities in India are under the ministry that also handles extension work, explaining why they have been relatively successful in carrying out relevant and appropriate research and teaching (India, 1988, 26).

Sometimes ministries set up competing activities which drain resources from the institutions. For example, in Nigeria the Ministry of Agriculture set up its own research structures that absorb much of the resources available for research (Nigeria, 1988, 16-17). In Ethiopia the linkages between Alemaya University, which is under the Ministry of Education, and the Ministry of Agriculture and Forestry are very good. Nevertheless, the Ministry of Agriculture is developing its own institutes which are competing for resources and making it difficult for Alemaya to continue the quality of its research and teaching (Ethiopia, 1988, 6).

Several institutions have devised mechanisms for linking these different functions. In India extension programs are state activities that receive technical support from the universities. They employ extension specialists who link research with extension work although the relationship could be improved. The study suggested that the commonly used T & V system promoted by the World Bank is probably too simplistic for the current emphasis on farming systems (India, 1988, 79-80). Of the three universities in Nigeria, one adopted the landgrant model, and it has been the most successful of the three. It accomplished this by incorporating an established research institute and an extension liaison base when it was first founded. The other two schools, neither of which enjoys these linkages, have had much less effect on farming practices. Alemaya University in Ethiopia links programs in research, teaching and extension even though the extension service was removed from the school recently. It

retains a small extension activity to insure that its research and teaching fit with agricultural problems (Ethiopia, 1988, 8).

Other schools have been less successful in linking these different functions. The Bunda Agricultural College in Malawi has trained all the manpower this small country can absorb and needs to broaden its function to do research and to bring technology to smallholders. Thus far it has failed to do this, in part because there are no institutional linkages. The Moroccan institute has also been unable to integrate extension work into its program, although the strong sense of commitment to appropriate technology has partly compensated for this lack. The study of Kasetsart University in Thailand notes that it has moved away from its original emphasis on agriculture, and needs to find a way to relate its curriculum to actual social and economic problems. This is proving difficult because there is little or no connection between the University and the extension services (Thailand, 1982, 48, App. B).

Another way to link research and teaching with farming systems is to establish direct links with farmers. Farmers often have a very unique perspective that differs from the views of those within research and training institutions. The experiences with agricultural research in Nepal illustrate the problems when researchers and farmers are not in contact. The farmers have their own criteria for the kinds of research they need such as greater emphasis on coping with shortages of water and fertilizer. Researchers in the meantime have been focusing on better seed but have not been successful in finding seed that meets the farmers' needs (Nepal, 1982). Because of their different experiences and background there is often a communication gap between researchers and farmers and it is difficult for farmers to influence research priorities (India, 1988, 82-83; Review, 1982, 16).

The studies describe several procedures for working directly with farmers. One is to carry out more of the research directly on small farms, allowing researchers, extension agents and farmers to communicate with each other (Review, 1982, 13). The Hassan II Institute of Agriculture in Morocco set up a Division of Rural Development that organizes faculty and student activities at the farm level and requires all students to do some practical field work (Morocco, 1987, 8-9). The India study notes that students can be effective in bringing information from farmers to researchers (India, 1988, 83). In Guatemala farmers collaborate directly with researchers to test innovative practices under different conditions with inputs supplied by the farmers. During the cropping cycle researchers then visit farmers to observe their experiences with the technology (Review, 1982, p. 52-3); Guatemala, 1982). The studies warn, however that operationally it is far more difficult to conduct research on farms rather than at a research station (Review, 1982, 2, 48).

There are the logistics associated with field visits, the longer time involved in planning the research, and the difficulties in communicating with farmers. Farmers can also introduce their own biases into the research. Finally decentralized field stations can be too small to be cost effective (India, 1988, 61).

3. Internal Organization and Management of Universities and Institutes

The internal organization and management of the university are critical for successfully carrying out relevant and appropriate teaching and research. One important factor is the relative importance of disciplinary boundaries as opposed to opportunities for interdisciplinary work (Review, 1982, 18, 54). A systems approach to farming requires researchers to be able to cross disciplinary boundaries, to integrate the social sciences with the technical departments. In the landgrant college model as practiced in the United States strong external pressure groups usually insured that knowledge from the university was applicable to agricultural settings. Since these are missing in most Third World settings, interdisciplinary work is all the more important (Nigeria, 1988, 19). The comparison of three Nigerian universities found that the more flexible, interdisciplinary arrangement in one school explained its more successful performance (Nigeria, 1988; see also Morocco, 1987, 28).

Multidisciplinary work is difficult in most existing university structures. Universities are typically organized by discipline and give few rewards for interdisciplinary work. In many schools, however, the role of the social sciences is very ambiguous, the technical aspects of agriculture are stressed and social sciences and even the basic sciences are relatively neglected (India, 1988, 51).

A second management issue concerns incentives and rewards for faculty to do on farm research and to emphasize appropriate and applied research. According to the study of Nigerian schools, "unless there is an appropriate institutional structure that rewards academics for problem-solving research and links research and extension in an interactive process, it is not realistic to expect a university to exert a major impact on the rural sector" (Nigeria, 1988, viii). Unfortunately promotion criteria seldom encourage research and outreach (Nigeria, 1988, 10; see also India, 1988, xii, Guatemala, 1982). In India all of the universities had established field stations, but their staff frequently feel isolated and receive few rewards (India, 1988, 61). In some cases the lack of incentives arises because faculty are hired according to civil service regulations, which typically reward longevity rather than research accomplishments. Rewards include salary increments, promotions, released time for professional development, conferences, travel, most all of which are greatly curtailed. For example, the agricultural institute in

Thailand operates under the regulations established by the Ministry of Agriculture. It has tried to set up an autonomous research unit, one with the authority to pay higher salaries than those going to the civil service. It ran into bureaucratic opposition, however, as soon as it began competing for resources (Thailand, 1982; Review, 1982, 66).

4. Support of National Governments

A fourth condition, and one mentioned in virtually all of the studies, is the extent to which the national government supports the need for a strong research capacity and for improved agricultural practices. One obvious reason is that governments are an important source of resources -- both money and counterpart personnel. A second is that government support is necessary to overcome the tendency to take a narrow and technocratic approach to agriculture. Third, governments have to provide such inputs as credit and other support services before farmers will respond to new technology or new approaches. And fourth, government policies need to encourage increases in agricultural productivity. For example, a project to improve maize production in Kenya succeeded in developing an effective and appropriate technology. The government, however, did not improve needed inputs such as credit and fertilizer, and its pricing policies did not encourage agricultural investments. As a result the project failed to increase productivity (Kenya, 1979). A number of studies presented evidence that those schools with government support were much more effective than those without it (India, 1988, 27; Kenya, 1979; Review, 1982, 60; Review, 1983, 9).

While it might appear that governments would have every reason to support a vigorous research and teaching program, there are a number of political reasons that discourage an emphasis on agricultural productivity or a systems approach to research and training. First, political leaders respond to those groups which are more organized and visible. Since urban groups are more apt to be organized, it is rational for political leaders to be more responsive to their interests than to those in more dispersed and less politically organized rural communities (Nigeria, 1988, 17). This means that governments favor policies that keep food prices low to benefit urban consumers and reduce the incentives to farmers to undertake new risks or expand their production (Review, 1982, 63; Kenya, 1979).

Second many existing practices are politically useful to them because they allow them to dispense positions or benefits to their political supporters. One example concerns import licenses. An increase in agricultural production usually means less spent on imports. Officials however, like to be in a position to distribute import licenses. Extension worker positions are a

second example. Political leaders are typically reluctant to cede authority over extension services to universities and research institutes. They want to control employment in the extension system because it is an important political resource that they can use to increase their support.

Third, governments may have an interest in expanding general education rather than promoting specialized technical skills or rural reform. The reason is that social groups think of education as a way to advance their social status rather than as a way to learn specific skills. Governments respond to these desires for social mobilization by supporting higher enrollment, a proliferation of universities, and free tuition. In Nigeria, as a result "the agricultural colleges have become primarily instruments of social mobility rather than instruments for agricultural change" (Nigeria, 1988, 18).

Fourth, and probably most important, the benefits of research and training are only evident in the long run, and there are few political benefits to leaders from putting a lot of resources into them.

Sometimes these political dynamics lead governments to encourage a proliferation of research and teaching institutions. In both Ethiopia and Indonesia governments are encouraging a variety of research institutes with the result that resources are being dispersed. From the perspective of a particular institution this diffusion of support usually means a decline in the quality of its teaching and research and makes it more difficult to integrate teaching, research and extension work. In Malawi the dispersion of teaching and research facilities duplicates resources and is proving very costly (Malawi, 1987). Many states in India are setting up multiple universities. The result is to make them more accessible and allows schools to be closer to their districts, but the evaluators felt that overall it had led to a deterioration in the quality of education and research (India, 1988, 23).

Government support is more likely when faculty are themselves involved in government activities but the relations are often tenuous. In Indonesia, faculty are secunded to government agencies and government agencies contract with the university for research. These ties have built relations between the school and the government, have given the faculty more influence over policy and have encouraged the university to be more outward oriented. Even so the linkages are very tenuous and if the government does not want to encourage linkages between the university and extension services they do not develop (Indonesia, 1988, 20, App. B, E, K). In the Dominican Republic the college has strong links with the Secretariat of Agriculture, giving them access to policy making and insuring that they support government policy interests. The problem is that many of these links depend

on individual faculty members and have not been institutionalized (Dominican Republic, 1988). The success of the institute in Morocco depends on the many linkages that faculty have developed with policy planning units in the government. Unfortunately there are fewer linkages between the research and extension services (Morocco, 1987).

One of the lessons is that universities and institutions need to be more politically skillful themselves and try to build constituency support. Several studies urged the university or research institute to be more proactive in building political supports among their constituencies and involving external groups in the universities. One way to insure accountability is to involve representatives from the private sector and farmer organizations in the governance of universities (India, 1988, 49-52, App. B). The Hassan II Institute in Morocco has maintained its autonomy vis a vis government ministries largely because it has used "informal networks of supporters and contacts to defend their" budgets and priorities. Like the leaders of many U.S. landgrant institutions, their leaders have been very entrepreneurial in building supporting constituencies and avoiding an undue reliance on any single sources of support (Morocco, 1987, 23).

Other institutions have failed to build these external supporting linkages and are facing declining resources and a lack of government support. The Kenyan government did not support a research project on maize, largely because there was no organized support for the project among smallholders (Kenya, 1979). In Ethiopia, the Alemaya University has failed to develop coalitions of supporters, and has adopted a purely technical approach to agriculture and an attitude of "detached competence" (Ethiopia, 1988, 9). The Nigerian study recommended that the university needed to forge an alliance of mutual interest with farmer groups who could then put pressure on the government to support the universities. If the university continues to rely solely on the government they will be increasingly vulnerable to budget cuts. The study added that farmers may be angry enough with recent government actions to organize and put pressure on the government. "Conversely if universities continue to rely fully on governing revenue without developing a strong constituency among farmers, universities will be among the first to bear the brunt of budget cuts" (Nigeria, 1988, App. D). Similarly the evaluators urged the Bogor Institute in Indonesia to develop additional resources of support in order to pay faculty more and keep them from going to the private sector where they can earn more money (Indonesia, 1988, 20).

D. Lessons Learned About Institution Building

1. To improve agricultural productivity it is not enough to

simply produce new technology and train people to use it. It is necessary to develop an institutional capacity to relate training, research, and extension services. This can be done by establishing structural linkages between the organizations responsible for these different functions or by developing direct linkages to farming activities.

2. Agricultural research will only influence a country's productivity if the government takes supportive action in providing needed inputs and supporting a marketing system and if economic policies encourage agricultural productivity. Otherwise money on research will be wasted.

3. The internal structure of the research institute or university is important, particularly a willingness to allow administrators to develop strong leadership roles and the presence of incentives and rewards for faculty to follow a farming systems approach to agriculture.

4. Institutions need to be more proactive in building alliances and constituencies, both to make them more accountable to the community and to make them less vulnerable to reduced government budgets.

5. Because the results of research are only evident in the long run, there are few political benefits to leaders from investing in effective research institutions. The investment in research therefore will continue to be grossly inadequate unless outside resources are made available.

III. Technical Assistance

In spite of a number of successful research and educational activities, support for agricultural research and educational institutions is problematic, and there are very few political incentives for leaders to support them. Such institutions, therefore, depend on long-term support from external organizations. As this section will make clear, however, many of the same disincentives operate for donors. They also find it difficult to provide assistance for activities where the benefits are only apparent in the long run. Current emphases on collaborative planning and interactive systems research only compound the problems that donors face in giving continuing support to research institutes and colleges and universities.

This section reviews what the evaluations indicate about the technical assistance AID has offered. First what modes of providing technical assistance have been used; second, what approaches have been taken to technical assistance; and third what lessons can we derive for designing and implementing technical cooperation? AID used a number of modes, but virtually

all involved cooperation between a university in the United States and a Third World institution. The approach that was used in almost all cases combined technical assistance to the institution by university personnel, and participant training of faculty or students in the United States. In general the assistance was fairly effective and most of the problems in institution building can be traced to problems within the countries rather than to the assistance itself. The major lesson is that future technical assistance needs to deal with the conditions discussed earlier that affect institution building and that it needs to be based on fuller collaboration with in country officials.

A. Forms of Technical Assistance in Institution Building

Technical assistance can be classified according to the recipient and the mechanism for providing assistance. In eight out of 16 cases assistance went directly to existing universities or research institutes (Thailand-1988, India, Ethiopia, Indonesia, Malawi, Dominican Republic, Morocco, Nigeria). In all of these cases the assistance was provided through a cooperative contract with a university in the United States which established a long term relationship between institutions in the United States and the Third World country. Essentially the university agreed to work with the Third World institution to determine what kinds of technical assistance and training were needed. Specific plans often evolved over the years, with contracts continuing for as long as 20 years in a few cases.

In two cases assistance was given to a parastatal (Guatemala and Tunisia). In both cases AID provided training to individuals who then developed the institution with the help of an international research institution.

In three cases AID agreed to assist a Ministry of Agriculture to improve its research and training or to set up research institutes under the Ministry (Thailand-1982, Nepal, Korea). Such arrangements were carried out either by a university, a private contractor or directly by the Mission.

Three of the evaluations looked at assistance to regional bodies (West Africa, Central America, and Kenya), instances where AID contracted directly with the regional body to upgrade its capacity. In West Africa, AID funded two research projects, set up a training center adjacent to an agricultural university, offered participant training and carried out a study of rice economics (West Africa, 1983). In Central America it helped an existing research and training institution (Center for Tropical Agricultural Research and Training, CATIE) to work more effectively with research institutions in five Central American countries to do farming systems research. Specifically it funded surveys of cropping practices and on-farm experiments to evaluate

alternative crops.

B. Approaches to Technical Cooperation in Institution Building.

Virtually all of the assistance combined some technical assistance by United States personnel with training of participants, usually in the United States. Typically in working with universities, the technical assistance included long term assignments by faculty from the United States who assisted both with substantive issues and with institution building. Usually the design of the TA tried to make the technical assistance and training complementary. That is participants would be sent for training, an expatriate would help out the university in their absence, and then they would work together when the training was completed.

Assistance provided to Bogor University in Indonesia illustrates its approach. AID financed a relationship between Bogor and universities in the United States that continued over almost 30 years. During the first phase a relationship was established with the University of Kentucky, and a number of faculty went to Bogor for long term assignments to assist in curriculum reform, setting up laboratories and providing books and supplies. At the same time Indonesia faculty came to the United States for study. In a second phase a consortium of universities in the United States provided further curricula reform, added graduate programs and trained more faculty in the United States. During a third phase the University of Wisconsin assisted with planning and managerial capacities through both short and long term faculty assignments, and more Indonesian faculty received training.

Since almost all of the technical cooperation covered in the evaluations involves either expatriate advisors or participant training in the United States, the rest of this section addresses these two approaches to assistance.

1. Technical Assistance, Roles of Expatriate Advisors

Most of the technical assistance (TA) was rated highly. Successful TA was more likely when three conditions were met: Expatriates remained in the country for a long time; expatriate faculty came not as individuals, but as representatives of an ongoing relationship between two institutions; and they played an advisory role. These conditions are obviously interrelated. An advisory role is more apt to evolve when expatriates remain for some time and when they come as representatives of a team that has established an ongoing relationship to a similar institution such as a university or research institute (E.g. Ethiopia, 1988). TA to the Ministry of Agriculture in Korea was not very successful because the expatriates remained only two years, there

was no sustained relationship between two institutions and the expatriates were more interested in carrying out their own research than in advising their counterparts (Korea, 1982).

These conditions are hard to fulfill. Several studies noted problems in finding the right person at the right time. There were often delays in finding appropriate people with the right language skills. Contracting firms have a harder time in finding people since they are not connected directly to universities. On the other hand United States universities often do not give adequate rewards or recognize TA in giving promotions or tenure and thus make it difficult for faculty to establish long term relationships. Given the lack of incentives, it is understandable that faculty are tempted to focus on their technical specialties, and pay less attention to working with counterparts or providing on the job training as happened in the Korea case.

2. Participant Training

In general the studies found that participant training overseas had been very valuable and usually ranked it more positively than the TA. Several studies noted that in recent years there have been many fewer opportunities for faculty to study abroad and that this has had an unfortunate effect on their productivity as researchers and teachers. Several found that it was particularly valuable when a sizeable group, "a critical mass," received training because they were more apt to exercise leadership when they returned (Indonesia, 1988). In Korea training of government personnel was rated very highly, partly because those trained came from a well established and continuing research setting where they could return to apply their learning (Korea, 1982).

Training presents a number of logistical problems. It often takes a long time to find qualified candidates. Even then supervisors are often reluctant to release those with important skills. It is also difficult to integrate the training and TA so that expatriate replacements arrive at the time when people are being trained and then remain in country long enough to work with the trainees when they return. The Nigerian case illustrates the problems of timing. "By the time many of the Nigerian faculty were returning from overseas training, the resident U.S. advisers were completing their assignments. Thus, the new Nigerian faculty frequently functioned without the guidance and support of more experienced advisers in designing and implementing effective internal programs and linkages with relevant external agencies and constituencies." (Nigeria, 1988, 18).

C. Lessons in Designing and Implementing Technical Cooperation Projects

1. Provide assistance to activities that have the strong support of country officials.

Given the strong emphasis on the need for government support, it is not surprising that many of the studies concluded that donors should assist those institutions that are priorities within the countries and have demonstrated some strength already. In Morocco, assistance was successful largely because Moroccan authorities took the initiative in designing their university and were strongly committed to the need for relevance to farming conditions (Morocco, 1987, 19). CATIE in Central America had a small but committed group of researchers and AID was able to build on its existing effort to improve small holder agriculture. In Thailand, by contrast, the research institution receiving help is proving to be very ineffective. The evaluators felt that AID should not have proceeded with the project since the institute was not officially recognized (Thailand, 1982, App. C, 3). One indicator of government support is the number of counterparts assigned to work with expatriates. According to one review the lack of counterparts was a major problem in one third of the projects it reviewed (Review, 1982, 84). One way to insure they are responding to country commitments is for donors to use their assistance to reward institutions for the initiatives they are already taking to address major societal problems as was done in the Dominican Republic (Dominican Republic, 1988, viii).

The evaluation of assistance to the regional institution, WARDA in West Africa reinforces this emphasis on following national priorities. Evaluators note that when donors do not find supportive national bodies, they may turn to a regional body which is easier for them to deal with. This will not work, however, since regional bodies cannot take the place of national centers. Regional units can be used to improve national systems, but not to take their place. In this case, WARDA has proved it can be a good advisory backstop because it is sensitive to the political setting in each country (West Africa, 1983, viii).

A corollary lesson is that donors should stress collaboration and consultations with country officials to determine their priorities and how to proceed. WARDA, a regional research unit in West Africa, put a lot of its funding into an unsuccessful venture. The evaluators argued that there had not been enough consultation between AID and the regional organization. Both donors and member organizations were using WARDA to promote their own strategies rather than using it as a mechanism for bringing the different parties together and developing a collective strategy. Collaboration, moreover needs to be ongoing during the project. For example, one of the reasons why the project to assist the research unit in Northeastern Thailand was so ineffective is that AID and the cooperating University stuck to the original design even though it had become clear that the Ministry of Agriculture had changed its conception

of the role of regional research centers (Thailand, 1982, App. C). Assistance to the Hassan II Institute in Morocco illustrates the value of ongoing collaboration. Those designing the assistance agreed to expand courses and degrees as the Institute proved that it had the capacity to carry these out. The assistance focused at first on a single unit, and was only gradually expanded through bottom up planning into other areas of the curriculum (Morocco, 1987, 21).

2. Design the assistance to create supporting organizational structures and incentive systems.

Donors need to take a systems perspective to their training and technical assistance. For example, it is not enough to train individuals, it is also important to encourage changes in the systems to which trainees return. Donors need to use their assistance to insure there are incentives and supports to reinforce the training.

This lesson has several implications. First, assistance will only have effects over the long run. Institutional development takes time, and many projects do not take this long time frame into account (Nigeria, 1988, 18) One reason is that it takes time to develop trust and good relations. At the Bogor Institute in Indonesia, leaders remained in office a long time and "relationships of confidence, informality, and easy accessibility developed between the leadership of IPB and the AID contractors. These long-term relationships allowed (all of the parties) to evolve a common understanding of strategic priorities and opportunities which needed to be addressed" (Indonesia, 1988, 20). Success in the Moroccan case was largely due to AID's willingness to continue its assistance through three different projects, and to the long term commitment by the University of Minnesota. The University allowed faculty to remain there for long periods and did not penalize them on their return (Morocco, 1987, 22; see also Thailand, 1988).

Second, donors need to develop institutional supports within the units to which trainees return. The library and documentation center funded by AID at the Hassan II Institute were important aids for returning trainees (Morocco, 1987, 9). TA should emphasize the need for improved personnel systems that reward faculty for working with farmers and for interdisciplinary activities.

Third, assistance should encourage linkages with the broader policy making process. The Malawi study, for example, found that the TA and training had been very effective in faculty development. It was less effective in creating needed institutional supports and insuring that the trainees could have maximum effect. The "assistance was not designed to link and utilize enhanced faculty capacities to the larger policy and

research structures within the agricultural sector" and the college remains isolated (Malawi, 1987, viii). Those evaluating Kasetsart University stressed the need for more linkages to other institutions such as the extension system. "Building these linkages will require a new kind of expatriate technical assistance that features less emphasis on the development of traditional technical assistance and more on the organizational process skills and systems perspectives required in building lines of communication and alliances at the interface between the university and outside constituencies" (Thailand, 1988, 52).

3. Remove Constraints Within AID for Institution Building

There are a number of reasons why AID finds these emphases difficult. First, incentive structures within AID make project revisions and flexibility difficult. One evaluation team recommended that AID staff be required to review projects every few years as part of the normal project implementation process. Part of the review should ask whether the projects should be continued (Thailand, 1982, App. C). Second, recent changes in the staffing of AID missions mean that there is often a lack of technical experts within missions to review research projects (Review, 1982, 58). Third, the lack of continuity in mission staffing makes it difficult to address the long time frame needed for agricultural research projects (Review 1983). Fourth, AID regulations complicate procurement and cause shipping delays (Review, 1982, 85).

Evaluations in particular need revision. First, evaluation teams are typically composed of economists and agricultural specialists and seldom include management specialists who would be more sensitive to institution building issues. Second, the 1982 Review found that evaluations usually focused on inputs and outputs and paid less attention to impacts (Review, 1982, 2). The impact evaluations included in the present review were designed to remedy this problem. Third the 1982 Review also found that most evaluations failed to deal with pressing implementation problems. For example few dealt with problems in implementing on-farm research, multi-disciplinary research, or small farmer participation in research (Review, 1982, 43). Fourth, evaluations focussed on specific cases. Because the cases were noncomparable the studies were unable to address patterns (Review, 1982, 87). The methodology associated with the impact evaluations tried to deal with this problem by circulating a background paper on issues associated with assisting research institutions, and holding a conference on the subject after the studies were completed (Review, 1983). Fifth, evaluations frequently fail to address institutional issues such as recurrent costs, counterpart relationships, price incentives and the need for supporting government services (Review, 1982, 81).

APPENDIX A

Country, Institutions, and Projects That Were Evaluated and Reviewed

Central America, 1980. Center for Tropical Agriculture Research and Training (CATIE). Project to develop CATIE's capacity to work with agricultural institutions in Central America. A.I.D. support from 1975 - 1979.

Dominican Republic, 1988. Superior Institute of Agriculture, a private university of higher education. A.I.D. support 1962 - 1987 in construction materials, participant training and technical assistance.

Ethiopia, 1988. Alemaya University of Agriculture, A.I.D. support 1952 - 1968 for technical assistance.

Guatemala, 1982. Institute of Agricultural Science and Technology (ICTA). A.I.D. support 1975 - 1980 for a Food Productivity and Nutrition Project. To improve basic food crops and strengthen ICTA as an institution.

India, 1988. 26 State level Agricultural Universities, A.I.D. support 1952 - 1972 in technical assistance and participant training.

Indonesia, 1988. Bogor Institute, premier higher education institution. A.I.D. support 1957 - 1986, providing technical assistance to the Institute and participant training.

Kenya, 1979. Regional Institute, the Organization of African Unity and the East African Community, Project to improve research on maize. A.I.D. support 1963 - 1977.

Korea, 1982. Program to improve the capacity of the Office of Rural Development of the Ministry of Agriculture and Fisheries. A.I.D. support 1974 through 1980 to offer training, equipment and technical assistance.

Malawi, 1987. Bunda Agricultural College. A.I.D. support 1966-1970 and 1976 - 1980 in construction of buildings, expatriate faculty and participant training.

Morocco, 1987. Hassan II Institute of Agriculture and Veterinary Medicine. A.I.D. 1969 - 1989 in technical assistance and participant training.

Nepal, 1982. Food Grain Technology Project to improve the agricultural research and extension system. A.I.D. support from 1957 - 1984 in participant training and constructing facilities.

Nigeria, 1988. Ahmadu Bello University, University of Ife, University of Nigeria. Projects to improve their capacity, 1971 - 1978, 1962 - 1975, and 1960 - 1967 through participant training and technical assistance.

Thailand, 1982. Agricultural Research Center, Northeastern Thailand. A.I.D. support 1966 - 1975 in participant training and technical assistance in institution building.

Thailand, 1988. Kasetsart University. U.S. support 1951 - 1965, providing technical assistance and participant training.

Tunisia, 1983. Wheat Development Program, to develop Tunisian institutions and train Tunisians in research and extension methods. A.I.D. support 1965 - 1977, primarily in participant training.

West Africa, 1983. A regional unit, the West Africa Rice Development Association. A.I.D. support 1975 - 1980 for technical assistance, participant training, commodities, construction and operating costs.

APPENDIX B

Evaluations Reviewed
Referenced in text by name of country

Central America, 1980. Harlan Hobgood, Rufo Bazan, Rolle Ehrich, Francisco Escobar, Twig Johnson, Marc Lindenberg, Central America: Small Farmer Cropping Systems. A.I.D. Project Impact Evaluation Report No. 14. Washington D.C.: Agency for International Development, December 1980.

Dominican Republic, 1988. David O. Hansen, Gustavo Antonini, John Strasma. Dominican Republic: The Superior Institute of Agriculture: Development of a Private Institution of Higher Agriculture Education. A.I.D. Project Impact Evaluation No. 67. Washington D.C.: Agency for International Development, March 1988.

Ethiopia, 1988. Edwin Price, Conrad Evans. Ethiopia: Alemaya University of Agriculture. A.I.D. Project Impact Evaluation Report. Washington D.C.: Agency for International Development, July 1988.

Guatemala, 1982. J. K. McDermott, David Barthrick. Guatemala: Development of the Institute of Agricultural Science and Technology (ICTA) and Its Impact on Agricultural Research and Farm Productivity. A.I.D. Project Impact Evaluation Report No. 30. Washington D.C.: Agency for International Development, February 1982.

India, 1988. Lawrence Busch, Universities for Development: Report of the Joint Indo-US Impact Evaluation of the Indian Agricultural Universities, A Synthesis of the Team Reports. Washington D.C.: Agency for International Development, February 1988. This Report was based on in depth studies of ten universities in the Indian Agricultural University system: G.B. Pant, Andhra Pradesh, Haryana, Tamil Nadu, Orissa, Karnataka, Mohanlal Sukhadia, Rajendra, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Mahatma Phule Krishi Vidyapeeth.

Indonesia, 1988. Gary Theisen, George Armstrong, Patricia Vondal, Donald Barton, Shakir Hussein, Roger Packham. Indonesia: The Bogor Institute of Agriculture. A.I.D. Project Impact Evaluation. Washington D.C.: Agency for International Development, July 1988.

Kenya, 1979. Charles W. Johnson, Keith Byergo, Patrick Fleuret, Emmy Simmons, Gary Wasserman, Kitale Maize: The Limits of Success. A.I.D. Project Impact Evaluation Report No. 2. Washington D.C.: Agency for International Development, December 1979.

Korea, 1982. David Steinberg, Robert Jackson, Kwan Kim, Hae-kyun Song. Korean Agricultural Research: The Integration of Research and Extension. A.I.D. Project Impact Evaluation Report No. 27. Washington D.C.: Agency for International Development, January 1982.

Malawi, 1987. Delane Welsch, Jan Flora, Henry Foth, Tom Westing, Gary Hansen, Malawi: Bunda Agricultural College. A.I.D. Project Impact Evaluation Report No. 64. Washington D.C.:

Agency for International Development, July 1987.

Morocco, 1987. John Eriksen, Lawrence Busch, Jack King, James Lowenthal, Rolland Poirier. The Hassan II institute of Agriculture and Veterinary Medicine in Morocco: Institutional Development and International Partnership. A.I.D. Project Impact Evaluation Report No. 65. Washington D.C.: Agency for International Development, July 1987.

Nepal, 1982. Emmy Simmons, Joseph Beausoleil, Gary Ender, Gregory Heist, Josette Murphy, Food Grain Technology: Agricultural Research in Nepal. A.I.D. Project Impact Evaluation Report No. 33. Washington D.C.: Agency for International Development, May 1982.

Nigeria, 1988. William Gamble, Rae L. Blumberg, Vernon Johnson, Ned Raun, Three Nigerian Universities and Their Role in Agricultural Development. A.I.D. Project Impact Evaluation Report No. 66. Washington D.C.: Agency for International Development, March 1988.

Thailand, 1982. Michael Calavan, James DeBoer, Paitoon Rodwinij, Isara Sooksathan, James Wilson, Agricultural Research in Northeastern Thailand. A.I.D. Project Impact Evaluation Report No. 34. Washington D.C.: Agency for International Development, May 1982.

Thailand, 1988. J.H. Eriksen, J.L. Compton, N.M. Konnerup, H.D. Thurston, G. Armstrong. Kasetsart University in Thailand: An Analysis of Institutional Evolution and Development Impact. A.I.D. Project Impact Evaluation Report. Washington D.C.: USAID, June 1988.

Tunisia, 1983. William F. Johnson, Carl Ferguson, Mona Fikry, Tunisia: The Wheat Development Program, A.I.D. Project Impact Evaluation Report No. 48. Washington D.C.: Agency for International Development, October 1983.

West Africa, 1983. John Lewis, Sidney Bowers, Elon Gilbert, Robert Jackson, William Scott, West Africa Rice Research and Development. A.I.D. Project Impact Evaluation No. 44. Washington D.C.: Agency for International Development, May 1983.

Reviews of Evaluations

Review, 1982. Paul Crawford, with A.H. Barclay, AID Experience in Agricultural Research: A Review of Project Evaluations, A.I.D. Program Evaluation Discussion Paper, No. 13. Washington D.C.: Agency for International Development, May 1982. This report was based on a review of evaluations of 48 different projects.

Review, 1983. Josette Murphy, Strengthening the Agricultural Research Capacity of the Less Developed Countries: Lessons from AID Experience, A.I.D. Program Evaluation Report No. 10. Washington D.C.: Agency for International Development, September, 1983. This report was based primarily on a review of 8 A.I.D. Project Impact Evaluations; all of these were also reviewed for this study and are listed above. They include the above projects in Kenya, Central America, Korea, Guatemala, Nepal, Thailand (1982), Tunisia, and West Africa.