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PN-AAS-791²
ISN 40132

ABSTRACT

AGRICULTURAL EDUCATION
AND TRAINING
IN AFRICA

Prepared for EHR and ARD of AID's Africa Bureau
Under USDA/GS Contract # BAF-0135-R-46-2224-01

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Research and Support Services Provided by
Developing Countries Information Research
Services, Inc., Washington, D.C.

July, 1983

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see PN-ANN-106

ACKNOWLEDGEMENTS

The research team wishes to express their appreciation to the following individuals who were interviewed in the course of the study:

AID: Richard Cobb, Wilbert Holcomb, Fred Holmes, James Hoxeng, Frank Method, Henry Miles, John Swallow, Marion Warren and Rufus Waters.

WORLD BANK: David Gooday, Linda Muller, and Bernard Woods.

We are indebted to the EHR/ARD supervisory task force members: John Swallow, Ryland Holmes, Victor Barnes, Marty Schulman, Terry Hardt, and Marcia Ellis.

We would also like to acknowledge the assistance of the staff of the Development Information and Utilization office, especially Ellen Boissevain and Helen Davidson for their help in documentation and information acquisition.

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Agricultural Education and Training in Africa

Abstract Summary

Background

With a few exceptions, food production per capita throughout Sub-Saharan Africa has continued its decade-long decline. Most analysts attribute this poor performance chiefly to three factors: 1) a limited capacity for policy analysis and formulation; 2) inappropriately structured and inefficient institutions; and 3) a critical shortage of trained people. Realizing these constraining factors, the Agency for International Development (AID) Africa Bureau has begun an in-depth investigation of the linkages between human resource development and agricultural growth. The study presented below represents one aspect of this review of agricultural education and training interventions.

The study was conducted for the education and Human Resources Division (EHR) and the Agriculture and Rural Development Division (ARD) of the Africa Bureau of USAID with the purpose to establish priorities for improving agricultural education and training programs throughout Sub-Saharan Africa. Its significance complies with AID's determined need to more fully integrate the food production and education systems in AID's activities in Africa. The findings and recommendations in the study are expected to stimulate thought and dialogue on the specific constraints hindering human resource development. They also seek to improve AID's design and evaluation of agricultural education and training programs and to encourage more relevant research and experimentation where warranted in African countries. Overall, the study represents part of an attempt to determine the extent to which training has influenced primary agricultural producers in adopting improved farming practices.

From an initial search of 2,000 Sub-Saharan projects implemented over a 27 year period, 135 projects were identified for examination. These projects were identified on the basis of their focus on agricultural education and training. They were examined for their type of intervention, intended target group, and magnitude of impact. Nineteen were selected for in-depth analysis. These case studies identified the types of constraints the project attempted to overcome, the type of technology delivery system the project employed, and the constraints the project faced during the course of action.

Besides the above document analysis, a series of interviews were conducted with experts in the World Bank and in AID. These interviews determined the current status of agricultural education and training programs in Africa, and highlighted the critical constraints to designing and implementing effective projects.

As part of the study's effort to establish existing capability, approximately 250 African agricultural education and training institutions were identified. These institutions have been categorized according to country distribution and type and level of education and training programs, including formal and nonformal educational approaches.

FINDINGS

During the colonial period, African educational systems became reflections of immediate administrative needs of foreign governments rather than of the long-term requirements of the colonial states. Any concern for agriculture, for instance, in the British curriculum dealt primarily with skill training related to export crop production needs. Otherwise, attention to this sector was left principally to the determination of individual school administrators. As primary school systems rapidly expanded after political independence of nations, agricultural education continued in a limited way to be part of "general education" or "rural science" at lower educational levels. African education began to introduce changes to integrate agriculture at varying degrees at all educational levels. However, some systems stressed agriculture in university training, thereby shifting priorities away from middle-level technical training and basic education.

AID's projects in African development number about 2,000 that have been implemented by the end of 1981. Of these, 770 or 39% focused on agricultural development, nutrition, education, and human resource development. Of the 770, 135 projects or 18% dealt specifically with agricultural education and training. The first of such projects was initiated in Ghana in 1957 in the Agricultural Extension and Production Project. These 135 projects represent a total budgetary outlay of \$670 million in grants and \$131 million in loans, for a grand total of \$801 million. Approximately two-thirds of this amount was directly attributed to agricultural education and training.

The portfolio of 135 projects studied and other related documents which discuss AID's overall global contributions revealed other trends and characteristics as follows:

- AID's global contribution to education and human resource development has declined from almost 6% to 2.5% of the overall development budget from 1974 to 1983, indicating that priority allocation towards the sector has generally declined. The same pattern of allocation can be observed in African budgets, which show a decline from 12.2% in 1974 to 4.6% in 1983.

- More than any other region in the past decade, Africa has received an increasing share of global development funds (8% in 1974 and 14% in 1983). However, the commitment of funds to the education/human resources and the agriculture sectors has declined overall. Despite this, a greater proportion of AID resource expenditures in Africa has been directed toward agriculture and education than has been true of other Regions of AID or of the Agency as a whole. This indicates a basic high level of concern within the Africa Bureau regarding both sectors' activities.

- The distribution of AID's agricultural education and training projects in Sub-Saharan Africa indicates that, prior to the 1970's, West and East Africa received equal attention at the expense of the other regions. Yet, only a total of 21 projects were implemented up to 1970. During and after the 1970's, regional emphasis expanded to include the Sahel (29 projects), Southern Africa (19 projects), and Central Africa (5 projects). A total of 114 projects, an increase of 84%, were implemented between 1970 and 1982. Overall, 73 of the total 135 projects were completed by 1982. In East and West Africa, more than half of the projects programmed has been completed by 1982, with the reverse true in the other regions, indicating a regional shift in recent years.

- Of the 135 projects funded in the past 27 years, the heaviest overall emphasis was placed on technical and higher education programs or advanced university degrees with less emphasis on primary and secondary level education. In recent years, the trend in agricultural education has focused on developing nonformal training for the small farmers and related communities (44 projects, or 33%). Attention to primary and secondary schooling has only emerged in the mid-1970's.

- During the 27 year period, the average project cost of the 135 projects drastically increased while the average project duration decreased. In the 1950's and 1960's, the average project cost was \$3.3 million with the average duration of 11.5 years. In the 1970's and 1980's, the average cost increased to \$6.4 million and the average duration decreased to 5.2 years. The year 1978 was the peak year with 33 projects approved for a total cost of \$330 million, which is 41% of the almost three decade period cost of \$801 million.

The above trends raise questions about how AID's managerial, technical, and supervisory personnel have had to adapt their activities to the shorter duration effort as well as to regional shifts and changes in educational emphasis. Some of these questions are posed as part of the recommendations for developing strategies, as will be presented later in this summary.

Project Profiles Analyses:

From an inventory of 135 agricultural education projects in Africa, 33 projects had predominately agriculture education and training components. Nineteen of these were chosen for in-depth analysis. Selection of these projects is based on:

- the significant agricultural education and training focus;
- the availability of project evaluation documentation; and
- the spread of levels of application including primary, secondary, higher and nonformal education.

Project abstracts were prepared, each discussing project purpose, constraints the projects wish to overcome, the type of training provided in implementing the

project, degree of success in achieving outputs, and, finally, the major constraints which the project faced.

The projects which were analyzed specialized in training at the levels of farmer training, extension training for technical field staff, and university degrees in higher level administration and management of agricultural programs. Two of the 19 projects focus on primary level education. However, due to inadequate documentation and the general lack of AID-sponsored projects in Africa at the primary level, several descriptions of Latin American projects are included. They offer suggestions about viable approaches that can be used for developing agriculturally-related programs affecting primary school children, families, and teachers. These projects are in Thailand, Paraguay, Chile, Haiti, Guatamala and Honduras. Two of the 19 projects include secondary school agriculture programs, a number suggestive of the limited AID involvement in agricultural training in secondary schools. The countries having the 19 projects are Ethiopia (2), Ghana (2), Kenya (2), Niger (1), Nigeria (3), Senegal (1), Somalia (1), Tanzania (4), and Uganda (3).

Following is a discussion of some of the categories of constraints faced in project design and implementation. These constraints are divided according to those attributed to host-country operations and environment, and those attributed to AID and contractor operations.

1- Host Country related Constraints:

A. Design Level Constraints

- a. Administrative Issues: There is a general lack of data for planning and evaluating projects, largely due to the weak establishment of supervisory and communication structures for implementation at the field and administration levels. Some of this is due to the limited collaboration among project participants in planning the content of project programs; budgetary supports are also hampered by environment factors, like drought and poor production levels, or by political interests. Planning manpower needs is often constrained by poor trainee selection procedures, inadequate number of trainers, and little consideration for incentives and pay promotions which provide for the continuity of staff.
- b. Technical Issues: Often there is more emphasis on developing research capabilities than on applying research findings through extension approaches. This, plus the initial resistance to extension functions by program staff, makes implementing structures hard to establish.

B. Implementation Level Constraints

- a. Administrative Issues: Weak administrative and organization structures as well as weak management and reporting skills of trained ministry personnel contribute to the limited performance of both host government officers and outside advisors. Where inter-institutional program coordination is required, there are usually difficulties sharing facilities and services between ministries. Increased pressures to expand rural youth programs may not favorably match with Ministry of agriculture resources to deliver. Some program operations constraints consist of the following: change of ministry leadership delays policy-and decision-making; frequent rotation of staff and relaxation of incentives produce low morale; returned participant trainees are often placed inappropriately into project operations; delays in schedule require costly extension of resources; budgetary allocations do not reflect program objectives, often resulting in lack of support in providing facilities or creating positions.

- b. Technical Issues: Developing trained personnel and placing them adequately in ministry positions is a major constraint. Also, the shortage of trained manpower slows progress. The lack of follow-up training for trained teachers or the weak skill training in management and agricultural education methodologies limits program functions. Other issues concern trainee selection. Often, there is an insufficient number of trainees for project needs, or trainees come to training with poor backgrounds due to an educational lag in their country, particularly at senior levels. Counterpart selection faces competition with other donor-assisted programs. The slow recruitment of students often causes under-capacity operation of the host country training institutions. Training schedules lag behind due to host country selection delays. In terms of curriculum instruction and methodology, curriculum policy undergoes changes during a project, or the curriculum development process is not rapid enough. Full-time training staff's duties overtax their abilities to respond to curriculum development needs or to develop new areas for research. A lag often occurs in disseminating information of trials and research through extension training with farmers. Practicals tend to be too theoretical. Poor incentives for farmers discourage farmer adoption of local technologies. Low Marketing Board prices or poor economic returns on crops produce resistance to innovation by project beneficiaries. Finally, in terms of evaluative data, effects of extension training on crop production is usually not known during the project, and data of trainee performance is not available or standardized between training centers.

II - AID/CONTRACTOR related constraints:

A- Design Level Constraints

- a. Administrative Issues: Often, the roles of technical staff, project

manager or Chief of Party are not sufficiently delineated, making management of the team awkward. The selection of commodities may be inappropriate, of low utility and difficult to maintain. The stipulation to purchase U.S.-made equipment is not flexible enough to allow purchase of appropriate equipment regionally. Also, loans for obtaining commodities are not as workable as a grant.

- b. Technical Issues: Participant training is sometimes not relevant to local situations, and particularly, results in a lack of provisions to train agro-mechanics and repair personnel to maintain important equipment. In terms of evaluating the performance of the contractor or implementing agency, there lacks adequate measures for assessment.

B- Implementation Level Constraints

- a. Administrative Issues: Basic logistics problems in implementing projects occur due to the lack of adequate transport, the poor organization of commodity records, or delays in constructing facilities to be used by the project. In terms of personnel, there are delays in the timely recruitment of qualified expatriate personnel. Personnel may be less motivated or less qualified to meet project demands. There are, also, problems of personnel renewal/nonrenewal of contract due to the poor communication of deadlines. The use of equipment poses many problems: the improper sizing or poor condition of equipment selected; difficulties in procuring spare parts; haste in purchasing to meet fiscal year deadline and inadequate consultation with users results in inappropriate selections; the control and management of equipment causes conflicts between expatriate and local staff.
- b. Technical Issues: An insufficient number of host country counterparts results in having too many expatriates on the project, particularly when participant trainees are away on training. This situation can bias project performance towards contractor control and influence. Likewise, contract technicians can assume too many administrative duties or research activities over their teaching and advisory responsibilities due to lack of host country administrative and management personnel. Other issues obstructing the technical implementation of projects are the loss of foreign instructors (due to death, resignation, etc.), the inadequate language competency of advisors, contractor staff rotations which cause disruptions in operations, and the general lack of high quality technical support.

In summary, responsibility for design constraints fell on AID with implementation constraints largely existing in the host country operations. The severity of constraints faced by the host country is seen in the general program operations and technical issues concerning utilization of trained personnel, trainee selection, and curricular consensus. AID's main constraints involved

administrative issues of logistics, commodity support and personnel recruitment.

Opinions of World Bank and AID

Surveys of opinions about the state-of-the-art of agricultural education and training in Africa were conducted and designed to complement the findings of the document analyses discussed above. Individual interviews provide information about project strategies not otherwise available through structured and sometimes scarce reports and documents. Those interviewed have backgrounds in development issues related to education, agricultural and rural development, and extension/training, both within the World Bank and AID.

Discussion centered on the present trends in developing a strategy for agricultural education and training. Administrative constraints to design, implementation and evaluation were discussed along with the types of agricultural education and training interventions that should receive priority attention and funding in the following order:

1. Strategy : Currently, the World Bank has an agriculture education subcomponent of its education policy paper, whereas AID has yet to develop such a component within its Africa Bureau Education and Human Resource Division. With regard to agriculture education, the present trends of the World Bank indicate:

- * aid for primary and nonformal education has increased while aid to secondary schooling has decreased sharply;
- * aid to the development of curricula has become increasingly technical; curriculum development in management is emerging;
- * support of formal agricultural education has decreased;
- * strong emphasis is placed on nonformal agricultural education through project-related training and extension service projects;
- * construction is still the major lending outlay, although it is decreasing in magnitude;
- * technical assistance to improve the qualitative aspects of education has increased;
- * project-related training has increased substantially as a component of projects in other sectors.

Regarding AID strategy formation, a long term development approach was initiated through Title XII, expanding the participation of Land Grant institutions in international agricultural education. Interventions were taken

from experience in Latin America and Asia and transplanted on the African continent. Agricultural strategy papers of AID's Africa Bureau place greater stress on manpower development. AID Policy Paper on Food and Development stresses developing institutional capabilities and applying improved science and technology for food and agricultural development. Over recent years, this policy has been translated more frequently into projects which provide training for agricultural personnel. On the other hand, AID Policy Paper on Basic Education and Technical Training of December 1982 speaks to the internal efficiency of vocational education and technical training programs, and the diversification of education and training opportunities, with no reference to agricultural education and training.

In reviewing recent Country Development Strategy Statements (CDSS), AID is focussing as immediately as possible on increasing the agricultural productivity of the smallholder farmer. This is to be accomplished by improving the agricultural extension services. Another shift of emphasis is in orienting agricultural research towards developing more appropriate technologies and methods of transfer. In some cases, a shift is occurring from improving farming systems. CDSSs show attempts to develop more specialized cooperatives, and expand the use of education radio and the mass media for information dissemination. AID will continue to assist formal education in training staff for universities and government ministries. AID/CDSS strategy places increasing emphasis on reaching and training women through extension services.

It appears that though individual country AID missions have formulated their own strategies towards agricultural education, there still exists an implementation gap between policy and practice in AID's overall agricultural education projects.

2. Constraints : Individuals listed the following constraints within the donor agencies which hinder agricultural education and training activities within institutions:

- * lack of manpower and poor centralized planning and supervision;
- * projects too theoretical in approach;
- * inability to define the problem at the micro-design level;
- * inappropriate timeframe in designing;
- * inaccurate estimation of costs (including recurrent costs);
- * suggested training not relevant to needs;
- * lack of good communication with host government/ministries;
- * frequent staff turnover, hampering continuity of project;
- * shortage of qualified implementing personnel.

- a. Design Constraints were threefold: 1) Unrealistic assumptions were made about needs, manpower, host country administrative capability and timeframe. These occurred out of a lack of pre-design information. 2) Lack of flexibility in the design permitting adjustments to unforeseen delays, costs, political changes, and to feedback and input from indigenous personnel about the relevancy of the project and about

the balance between theoretical and practical instruction. (3) Projects must avoid the "enclave" approach by actively involving host country participation in design and implementation levels, thereby strengthening decision-making capabilities of the host country in developing projects.

- b. Implementation constraints centered on the lack of qualified manpower at all levels or agricultural education and training activities. Part of this is due to the inaccurate assumptions operating about manpower capability from Host Country and/or implementing agency points of view. The distinction between what manpower the host government can actually afford to hire and maintain and that which is assessed as needed is often blurred. Another shortcoming in manpower assessment is that training for complementary jobs leads to an imbalance of supply and demand. For instance, the ratio of engineers to technicians might be exactly opposite of what is needed in practice. The lack of sufficient incentives, like pay promotions, career paths development, or provision of in-service training diminishes mid-career motivation and encourages a high drop-out rate. Other factors which have reduced motivation have been the lack of policies, such as farmer credit and pricing policies, and the cultural bias among the indigenous personnel against agricultural pursuits, generally. These reduced incentives are thought to occur regardless of the availability and quality of training. Other constraints to implementing projects concern the weak linkage between project and host country related institutions, and the limited support, mostly budgetary, by the host government.
- c. Evaluation constraints deal mainly with an over-emphasis on physical results at the expense of qualitative evaluation of less tangible components. Often projects are measured too near the project's end and too late to suggest changes, particularly in formal education programs where returns to investment may not be immediately measurable. U.S. and Host Country experts need to be included in evaluations with the team in order to represent opinions about the relevancy and impact of the project. The quality of document production needs to be improved and to include better records of names of individuals and agencies conducting the evaluation.

3. Interventions: Training interventions were ranked by those interviewed in order of priority. They were:

- * training for farmers and farm families;
- * primary and secondary schooling, and
- * mid-level technical training.

Scepticism was expressed about the cost-effectiveness of farmer training

activities, although confirmation was made that basic education does increase the productivity of the small farmer. Some believed that agricultural content should be increased in schools, but avoid specific technical and skills-oriented curriculum. Most agreed that agricultural technical training is more acceptable at post-secondary vocational and higher education levels, since the rural population seeks to shift their lifestyles away from agricultural pursuits towards urban careers. Mid-level technical training was considered a relatively cost-effective intervention and should address the package of skills needed for specific non-agricultural activities, like accounting, bookkeeping, and other administrative skills.

Other types of interventions that were mentioned by those interviewed were:

- * in-service and remedial training including upgrading of skills for mid-career personnel;
- * adult education through literacy and numeracy campaigns in addition to concepts which specifically improve the entrepreneurial skills of the farmer;
- * training of instructors and trainers to develop host country self-sufficiency in carrying out these activities.

Characteristics of specific types of interventions have emerged as noteworthy in addressing issues faced by the top priority target group - the rural farmer.

Agricultural Vocational- Training:

- * need to provide for farmer credit and land availability for the young farmer;
- * the certificate received should be considered of equal status as other vocational schools and not restrict qualification for further education;
- * if post-secondary agricultural schooling is the only type that is available in a certain area, it will be used as a means for further education and not necessarily a means to follow agricultural pursuits;
- * singularity of purpose: clear priority is placed on increasing agricultural production; extension activity is restricted to training farmers rather than being bogged down by a multiplicity of other functions that detract from the main purpose (such as

collecting for agricultural credit banks, acting as distributors, etc.);

- * extensionists go to the farmer: the problem of getting the farmer to consistently come into the extension centers is removed; the farmers are reached;
- * clearly outlined schedule and duties: the extensionist has a well-outlined set of duties, and schedules to visit the farmers regularly; the farmer develops an expectation of the visits and for information and training;
- * feedback: the program allows for continual feedback from farmers about what methods and techniques are effective, the extensionists relay information between the farmer and their own agricultural trainers. Experience shows that as farmers discover the benefits from extension, they initiate and respond to additional information and training;
- * extensive training provided: both for the farmer (one visit every two weeks) and for the extensionists, continual problem-solving, upgrading of skills and methodologies and transfer of research;
- * transportation: there needs to be a feasible means for reaching the farmers;
- * labor: because of the nature of individual farmer outreach activity, this is a rather labor intensive means of intervention which requires a large number of qualified extensionists;
- * cultural biases reduce women's participation in agricultural schooling below the post-secondary level;
- * vocational and post-secondary agricultural schools need to enforce enrollment targets for women, and not compromise these numbers to enroll more males;
- * maternal/child health programs can be used to provide agricultural training or information dissemination as it is an outreach framework that is already in place, trusted, and acceptable.

Interviewees indicated the following types of concerns and recommendations for future development of agricultural education intervention:

- * In order to program effective agricultural education and train-

ing interventions in the future, better pre-design manpower assessments must be conducted (taking into account the capability of the host country, the effective demand of the labor market, and priorities of the host government development policies).

- * The projects must be designed with enough flexibility to adjust to inaccurate and inappropriate assumptions. Formulative evaluations should be stressed to constructively shape and correct the project over the duration of implementation.
- * Since the small farmer and farm families (women and youth) were identified as the target group needing priority attention, each implementing agency needs to realistically assess its ability to design and implement projects in this area. The types of interventions, and the comparative advantage of different agencies to implement these interventions, may or may not justify the level of activity. In some cases, the dire need for assistance will justify intervention despite poor cost-efficiency, and should be assessed within this "emergency management" context.
- * The individuals supported the strategies of the World Bank and AID to emphasize the need to improve efficiency and capability within existing organizations and delivery systems rather than building and expanding into additional organizations and systems of extension.
- * Provision of universal basic education (equity of availability is viewed as a necessity, as part of rural and human resource development. The curriculum should be standard, and should be relevant to cultural attitudes and economic realities. The technical agricultural skills content of primary and secondary school should not be increased as it detracts from the transfer of basic education.

RECOMMENDATIONS

These recommendations have grown out of the various aspects of the study which include review of past and ongoing project activities, personal interviews and the review of relevant literature on the subject of agricultural education and training.

Since different views have been voiced in this study, it is felt that no one strategy for Africa is possible in agricultural education and training. If there is an overall strategy which the study suggests, it is to apply the recommendations below to the formulation of strategy for each country receiving

AID assistance. In this way, strategy formulation for a country can be done at two levels:

- a) developing a strategy for the type of intervention most suitable to specific country/regional needs based on host country identification of needs; and,
- b) developing an implementation strategy on how/why AID is to become involved, how to collaborate with the host government and/or other donor assistance, and how to identify project activities.

The development of these country-specific and overall AID strategies should engage the direct participation of the AID mission. The recommendations are as follows:

1. Identify a dual strategy for agricultural education and training projects by setting:
 - a) short-term objectives for specific learner groups, i.e., farmer training, upgrading of extension agents and technicians etc.; and,
 - b) long-term objectives applying to general education and upgrading of standards, curricula and institutional capability.

It seems inefficient to have only one strategy for the vast African continent because:

- a) countries and regions differ in their degrees of economic progress since the early 1960s; and,
- b) the mix of agricultural conditions, cultural dispositions toward agriculture and educational expansion vary from one region to another.

A dual strategy as outlined above would allow for adaptability in prioritizing AID's emphases on clientele groups and general institution-building needs within the context of regional resource availability and geopolitical realities and constraints. For instance, past efforts in AID's training programs in agriculture have had short-term focus on certain technical levels accompanied by short-term shifts of emphasis at the farmer level. These shifts do not appear to have produced long-term changes, notably among the grass-roots level of production. The core of a future strategy needs to avoid these shifts of emphasis and concentrate agricultural development at the grass-roots farmer and basic primary education level, thereby enabling implementation activities to have wider effect and support. The few examples of

formal school agricultural programs (notably in Kenya, Malawi, and Swaziland), as well as formal and nonformal education programs in certain Latin American countries are worthy of consideration regarding ways in which a dual strategy might apply in generating short-and long-term results. Also, given the 5-year timeframe of AID projects, a strategy could identify achievable targets within and beyond that period, provided proper follow-up evaluations as planned.

2. Base the development of country strategy and the future selection of countries for agricultural education projects on the success of past efforts of AID in completing projects and on the types of projects implemented. Criteria for selection could include:

- a) the levels of training which have been addressed, namely, the spread between managerial, technical, and farmer level training within the context of formal and nonformal education;
- b) the number of projects which have been completed thus providing information which can be used in the design and support of future programs; and,
- c) the overall magnitude of implementation activities during the past two decades.

The countries which show potential to yield adequate information due to the larger range of activities as identified above and would be suitable for further field investigations are Tanzania, Cameroon, and Botswana.

3. Tie both the education and agriculture sector plans under one economic umbrella of operation in an educational strategy for agriculture, starting with a focus on primary education, an area neglected in past AID project formulation. This focus should be followed by the gradual integration of post-primary training levels. Rural/agricultural sector resources and facilities need to be reflected at all levels of the education system, with sensitivity to students as potential end users of agricultural resources as well as eventual managers of such resources. Malawi and Swaziland are worthy examples where agricultural education is being included in secondary schools. The rural private sector uses a large percentage of youth, the majority being under 16 years of age in most developing countries. It is only in these early formative years that youth can obtain agricultural training through primary education where mass education exists. The other basic education focus within the large private sector is for adults at nonformal education levels. The two-pronged direction for agricultural training, on young children and untrained adults, is suggested since:

- a) both groups operate within family-based agricultural systems and can reinforce each other; and,

- b) emphasis in the past has been biased towards managerial, and higher-level technical training in order to build up institutional capabilities.

At present, consideration of the social private benefits to education in agriculture over the long term makes primary education attractive since cost to formal and nonformal basic education are significantly lower.

4. Conceptualize and design ways to integrate other development sectors with agriculture through the orchestration of the education sector, linked with community development. Due to difficulties in crossing administrative borders of ministries, little attempt has been made to adequately integrate within projects the common food-related goals in the health, nutrition and other sectors. Furthermore, most past AID training projects have been exclusively related to agricultural production disciplines and to training at technical and senior levels. Consideration could be given to ways to use more multi-sectoral teams in feasibility pre-design studies and in design processes. Specifically, inputs from educationists, both formal and nonformal, and closer working relationships between health educationists, nutritionists and other personnel in design, implementation and evaluation stages of agricultural education projects could substantially enhance integration efforts.

5. Concentrate in advance on institutionalizing data collecting networks before any attempt is made to enhance planning capability within the Ministry of Agriculture. There should be an attempt to match training activities to country needs by establishing a more reliable micro data base and infrastructural profile of the agriculture sectors to which training in identified skills will be directed. Often, the assumption that data exists and is accessible prevails as a basis of training, when, in fact, data-gathering skills and data management procedures are needed and often neglected. Technical and higher level individuals are often trained to manage information and formulate discussions without adequate statistical data-gathering and information-monitoring skills. As a result, ministry-level technicians and managers prove to be ineffective. Interventions which add to technical ability should include training in data collection and data management. Similarly, host-country training institutions should be capable of insuring the relevancy of training which most likely would entail shifting the focus of training from a small nucleus of administrators and policy-makers to suppliers and users of information. Likewise, participant training in the U.S. and third countries should avoid preoccupation with technically sophisticated data management methods at the expense of teaching basic micro-data and statistical profiling skills.

6. Develop realistic objectives for formulating post-implementation human resource management plans for effective utilization of trained manpower.

Recording of post project operations often ceases since AID obligations end at project termination. Also, field verification of interventions carried out by the host country after AID withdrawal of support are usually not done. As a result, from a management and cost/benefit point of view, questions remain on how trained personnel were utilized or underutilized in perpetuating government goals. Utilization appears to be the ultimate test for training effectiveness. Factors in developing effective resource management objectives include:

- a) whether governments have the capability to absorb the recurrent cost associated with the employment of trained manpower;
- b) the extent to which overall internal budgetary constraints of government limit the type of training or institutional development required;
- c) the effects of participant trainees on the sustainability of institutions after project completion;
- d) how training institutions have developed the capability to adapt to new training needs in accordance with established or planned government objectives;
- e) how performance of trained personnel provided the government clues on how to improve its ability to restructure training content;
- f) the extent to which technologies have been adapted by beneficiaries to improve their own traditional system of practices; and,
- g) how technologies have affected yields of production, and more positively, incentives and attitudes of users favorably.

7. Develop more adaptive technology for improving the extension approaches through nonformal education methodologies and innovations. There is a need for applied research on those extension activities which effectively use the existing indigenous infrastructure. This research would highlight:

- a) behavioral and attitudinal change occurring among male and female farmer's food consumption, health and nutritional priorities;
- b) motivational factors affecting the performance of extension workers; and,
- c) the acceptability of packages of information and practices for delivery by extension workers.

Activities and training programs involving youth in farm and farm-related services such as the vocational trades and small-scale enterprise development will develop skills and attitudes attuned to rural development. A focal point of extension activities in most African agricultural communities should be the application of more innovative extension approaches and technologies. Women should receive appropriate emphasis in this area due to their triple role as nurturers, producers (of foodstuffs) and managers in the family and the community.

8. Investigate ways to strengthen capabilities of existing educational and training institutions and to develop networks of activities and support between them. Many institutions in past AID agricultural projects have incorporated other smaller agencies or institutions into their service or production function. As these linkages form, there has been little reference to them. Many institutions in past AID agricultural projects have incorporated other smaller agencies or institutions into their service or production function. As these linkages form, there has been little reference to the effects of these linkages on strengthening or overburdening:

- a) the resources of each institution or agency; and,
- b) the networking itself, i.e. linking objectives, sharing personnel and costs, internal management, etc.

Consideration needs to be given to whether to develop the resources of larger institutions which affiliate with smaller ones or to develop specialized capabilities in the smaller institution which ultimately serves the larger overall training function. Inter-institutional links may have caused internal management problems and a lower quality of operation. If so, an investigation would need to be conducted on how new management training approaches could remove these constraints. Regional inter-country institutional links may require similar but wide consideration encompassing political and economic management of objectives and resources.

9. Identify more clearly the roles of the U.S. and host country private sector agencies, voluntary organizations, and the corporate community in promoting agricultural training programs. Further information is needed about cost factors of involving PVOs over the other types of agencies and the degrees and rationale of host country acceptability of one agency over another. Clarification is required about which type of agency, company, or institution can offer the best training for particular skills and how to assess their degrees of achievement according to the agent's capability. Also, information about what types of interventions are most appropriately used by the different implementors would shed light on the agent's capability, while avoiding comparisons between the agents themselves.

Besides PVOs and other agencies, investigation should be made about the activities of multilateral and bilateral donors, such as the Food and Agriculture Organization (FAO). Areas for joint activity could be identified once AID has examined how donor projects were implemented and the past experience of donors in overcoming constraints to agricultural growth.

Scrutinize Country Development Strategy Statements (CDSSs) to see if they balance realistically with the present AID Sector Strategy on education and agriculture development and the present situation of a country's stage of development. CDSSs should be examined as to whether they are consistent with new data, experience, and the past trends of other international agencies, like the World Bank, in developing agriculture programs. Other points of consistency for examining CDSSs might include:

- a) the linkage between universities and organizations responsible for agricultural development, and more generally, the overall education system in agriculture;
- b) the relevance of the CDSS with the country's planned policy and updated needs, i.e., whether a type of training intervention used in the past has relevance for the future training needs or requires further adaptation;
- c) the reflection of AID's Bureau Sector Strategies worldwide in individual African CDSSs.

Fresh criteria in developing CDSSs may be needed in order to link agricultural policy and education in agriculture and to assess whether a project-in-design following CDSS strategy is realistically matching the current country demands.

11. Investigate the present manpower capability of AID to manage, provide technical assistance and supervise its activities in adapting to the present trend of projects having higher costs with shorter duration. Manpower expertise should be viewed in light of the fact that the rate of projects being approved peaked at 33 projects for one year in 1978 compared to 21 projects approved throughout the 1960s. Manpower capability studies should also take into consideration AID's principal constraints in areas of design which involve administrative issues of logistics, commodity support and personnel recruitment.

An inhibiting factor in assessing AID's capabilities has been the poor retrievability and general lack of necessary documentation of past projects in spite of the modern information technology available. A better monitoring system to highlight successes and constraints of all projects is needed. Individuals who were involved in implementing and periodically evaluating projects should be identified in all technical documents so that those officers can be contacted and used as information sources. Additionally, the frequent rotation of AID administrative project staff has led to a lack of continuity and a short-term exposure of officers to projects requiring consistent and more long-range monitoring.

12. Hold operational seminars for design officers regionally, the purpose being to involve them directly with hands-on application in designing evaluation projects. Periodic seminars, perhaps semi-annually for one week, would identify specific strategy and design activities to be stressed. Topics for applied activities or research could include issues in the above recommendations with analysis and solutions developed at the mission level between seminars. The regrouping of the design officers as a result of these seminars should improve

problem-solving in project implementation stages.

Furthermore, seminars could be held in countries which offer success examples and opportunities for verifying field information relating to technical issues. Tanzania and Cameroon are suggested since combined they had 16 projects directed toward different levels of interventions.

In conclusion, we have offered the above suggestions for possible future investigation. These recommendations are to act as an umbrella of issues for consideration, acknowledging that the sub-issues can be expanded. Ultimately, we suggest as the very first step that a qualified contractor should be commissioned to develop the scope of work for conducting such seminars.