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SECOND ANNUAL EVALUATION OF  
A.I.D. PROJECT

"RURAL TECHNOLOGY TRANSFER SYSTEM"

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held in

Quito, Ambato, Machala, and Guayaquil, Ecuador

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I. EXECUTIVE SUMMARY

Differing perceptions of the project exist among AID, CONACYT, the University of Florida, and the Participant Ecuadorean Institutions, the most serious of which are between CONACYT and the others. The result has been that CONACYT has ceased to approve TA or training over the past year-and-a-half, prevented the University of Florida from performing its function, and reduced the project to one of trying to supply much-needed equipment from outside the country.

The project design rationale was overly ambitious, unrealistic, and at times almost self-destructive. This has led to ineffective administration and financing, as well as severely limiting the effectiveness of the technical assistance and training. Positive institution-building results have occurred in institutions where subprojects have been allowed with relatively less control and restrictions. Ten subprojects were visited, with varying results being observed. A follow-on to the Machala University Brucellosis subproject is suggested.

Input marketing and product marketing are two areas of opportunity discussed for the Private Sector Research component.

Observations on the overall evaluation of the project include that the basic objectives of project are sound; the design objective of establishing informal collaborative linkages institutions has failed because it was dependent upon an effective central administration unit, CONACYT, which was unrealistic.

Conclusions reached are that the project should either be terminated or radically redesigned, with redesign the preferred alternative; the redesign must address the critical need for technical training at several levels, and a redesign could accomplish both short and long-term agricultural development objectives.

It is recommended that the redesign include: making technical training the leading aspect; identify a limited number of institutions which will form the primary group in which investments will be made and which will form the primary advisory council; retain and strengthen appropriate subprojects; reconstitute the administrative services and select an institution to temporarily perform this function; and reconstitute the technical services contract. A new design should contain in-country short courses for technic-

al personnel, short courses in the U.S. or other eligible countries, degree training in the U.S. and in-country English training.

Finally the issues of criteria for selecting a new lead Ecuadorean institution, initial ideas about a training sub-project and a method for identifying research priorities are addressed as they relate to redesigning the project.

## II. INTRODUCTION

### A. Objectives of the Evaluation

The Project Agreement provides for periodic evaluations to assess progress toward meeting the project purposes and objectives. The first evaluation was completed in March, 1983 and this is the second one. The current evaluation builds upon the observations and conclusions of the first one. In view of difficulties that have been encountered in the past year in the implementation of the project, this second evaluation is expected to examine the project design as well as the administrative procedures to determine what remedial measures are indicated.

### B. Terms of Reference

The Terms of Reference specify that this external evaluation will address two basic issues: a) the project's purpose as written in the agreements and the mechanisms utilized to achieve that purpose by the three principal implementing institutions, i.e., CONACYT, USAID/Ecuador and the University of Florida, and by selected Ecuadorean institutions which have sub-projects financed by the Rural Technology Transfer System (RTTS) project, and, b) the use of sub-projects as a mechanism for achieving the project's purposes.

The complete Terms of Reference are included in Appendix 1.

### C. Composition of the Team

The Evaluation team was composed of three external evaluators identified by USAID/Ecuador and two proposed by CONACYT.

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### III. EVALUATION PROCEDURES

The activities developed during the evaluation period involved visits to several institutions, interviews with their respective heads, and when applicable with the technicians in charge of the projects.

Initially, contacts were made with the administration of CONACYT, AID personnel, and with personnel connected with the University of Florida (UF) Mission to Ecuador.

At a second stage, the Institutions responsible for the subprojects were visited. The calendar of activities followed during the visits is specified in Appendix 2, and the persons interviewed are enumerated in Appendix 3.

The visits and interviews provided the opportunities for the contacts in situ with the authorities involved and the team involved in the subprojects. More consistent and sequential information was obtained through the review of the available literature. The consulted items are related in Appendix 4.

### IV. PROJECT OBJECTIVES

#### A. PERCEPTIONS OF THE OBJECTIVES

##### 1. Initial Documents

- a. The Project Paper (pp) identifies three basic purposes of the project (p. 11-12)

"The first is to strengthen rural institutions so that they are able to serve the sector effectively; strengthening includes forming linkages among research, extension and education institutions, developing a trained human resource base, and improving management, delivery systems and analytical and statistical capacities".

"The second purpose is to develop and disseminate technologies appropriate to the needs of small farmers and the agricultural sector in general. This includes basic and applied research, dissemination of results, improved policy analysis, and improved program planning".

"The third purpose is to promote and support the establishment of the RTTS-- a management, administrative and financial system which can address problems



related to the institutional, technological, and other constraints of the sector on a continuing basis".

"In order to accomplish the project purposes, two essential elements will be developed during project implementation. These are (a) a Rural Technology Transfer System (RTTS) designed to institutionalize the transfer of agricultural technology from sources outside/inside Ecuador to the agricultural sector, and in particular to the small farmer sub-sector, and (b) a series of subprojects planned and managed by the RTTS, designed to strengthen the institutional linkages between agencies involved in agricultural extension, research and education, and to develop and disseminate technologies which will enhance agricultural development and rural welfare."

"In order to institutionalize the RTTS within GOE and have a workable technology transfer mechanism by the end of the project, considerable TA (and some other inputs) will be required". (p. 20)

## 2. Perceptions of CONACYT

The basic rationale and objectives of RTTS were formed prior to the formation of CONACYT, and when CONACYT was organized it was given the RTTS project to implement without benefit of having participated in its conceptualization. As CONACYT began to develop its own policies and procedures for coordinating science and technology activities of the country, it was not in total agreement with the rationale and purposes specified in the Project Paper. Specifically, two issues were at variance. First, it believes the requirements for Technical Assistance (TA) and for training are too stringent and inflexible, causing The Government of Ecuador (GOE) to spend much more on subprojects than is necessary and precluding maximum use of national expertise. Secondly, CONACYT feels that it does not have the necessary flexibility to adapt subprojects to the priority needs of Ecuador. Therefore, they are forced into actions which they feel are not wholly justified.

## 3. Perceptions of AID

AID financed this project under Title XII of the Foreign Assistance Act because it believed that a system of linkages between RTTS institutions and Title XII

institutions would be vital to the success of the sub-projects and to the RTTS after the project terminated. Therefore, a significant portion of the grant funds of the project were allocated to TA. After a year of operation of the project this perception seemed justified to such an extent that AID negotiated a loan to increase the resources for this activity and to give greater flexibility in its implementation.

AID also recognized the serious shortage in Ecuador of persons adequately trained in technology generation and transfer. Hence, it allocated another significant portion of the project to training.

#### 4. Perceptions of the University of Florida Mission

The contract which the University of Florida (UF) signed with AID to provide technical services to the project specified that one of the four activities for which it would be responsible was: "C. Identifique las fuentes apropiadas, internas como externas de conocimientos técnicos, adiestramiento para los subproyectos, y los canalice hacia las instituciones ecuatorianas de desarrollo rural participantes.". This specification is understood to include responsibility for making available TA support from Title XII Universities whenever it was apparent that such assistance could enhance the effectiveness of CONACYT and/or the agencies that were preparing or implementing subprojects. Such active participation is viewed as a major element in developing lasting linkages between the RTTS and Title XII institutions.

UF feels that there must be a reasonable number of persons within RTTS who have a solid training in scientific research and that much of this must come from degree training outside of Ecuador. Their contract makes them responsible for "pushing" this aspect of the project.

#### 5. Perceptions of the other Participant Institutions

Those institutions which have submitted subprojects for funding under this project perceive these objectives and purposes in a much more parochial light. They are seriously under-financed, especially for those elements that must be purchased outside Ecuador. They view this project as a possible source of funding, especially for equipment. In most cases they quickly came to realize the need for TA and for training of their own personnel

as they attempt to prepare proposals for funding under the project, and in most cases they eagerly seek such help.

There is an overwhelming desire for more training of personnel, but despair in satisfying the English requirements. Conceptually, however, the project is viewed as an opportunity to upgrade their personnel.

B. Implications of the differences in perceptions

The differences in perceptions of the objectives and purposes of the project were identified in the first Annual Evaluation of this project and there has been little success in removing or accommodating them. The most serious differences are found between CONACYT and the other actors in the project. It has meant that CONACYT has virtually ceased to approve any kind of TA or training in the past year-and-a-half. Such a position has removed from UF any possibility of performing one of its major functions. It has reduced the total project essentially to one of trying to supply much needed equipment from outside the country, and that function has also encountered serious roadblocks.

Unless these differences in perceptions can be resolved soon, an unlikely prospect, this project must be re-designed or terminated.

V. DESIGN OF THE PROJECT

A. Rationale for the Design

1. Organization

The design seeks to form a system of technology generation and transfer that will address the priority needs of Ecuador in a systematic and coordinated fashion. This is to be accomplished by placing funds in the hands of some agency that has a broad overview of the nation's needs and that can reallocate the project funds to collaborating institutions to achieve this purpose. In making such allocations, the administering agency would be able to coordinate the actions of the collaborating institutions and thus form a genuine system of technology generation and transfer.

Although it is very attractive conceptually, this is an exceedingly ambitious design for a nation in Ecuador's stage of scientific and technological development.

There are few examples of real success in this kind of undertaking in the highly developed countries of the world. Its success depends primarily on the existence of an implementing agency that has a good understanding of the nation's needs, that has an adequate system for allocating funds, and that has adequate political support for making allocations strictly on basis of merit. This simply is not realistic for this project.

## 2. Administration

The project design anticipates either the existence or the formation of an administrative agency with the highest qualifications, both technical and administrative. Success of the project is predicated on the thesis that such an administrative unit could resolve effectively the bureaucratic morass which cripples most TA projects. The project design considered several candidate administrative units and opted for the formation of a new unit which would have no administrative experience, no technical experience and no planning experience. To be sure, the qualities needed by the new administrative unit were adequately described, but there was little realism in expecting a country which was in the poor economic and scientific conditions of Ecuador to rob its existing institutions of the very best personnel and to politically and economically support the new organization to the extent necessary for it to succeed.

This aspect of the design was totally unrealistic.

## 3. Financing

The design called for this project to elicit from GOE counterpart funds of considerable proportions. In similar projects in other parts of the world, such counterpart funding is seldom if ever seen as an increase in the national budget for these purposes nor in increases in the allocations to the respective agencies within the country. The real fact is the most if not all of the counterpart funds must come from reallocation of existing budgets within the participating agencies. The overall result is to further impoverish existing programs in the hope that the outside funds will somehow compensate.

The financing of CONACYT with counterpart funds adequate to provide the stipulated positions at salary

levels necessary to attract the kind of talent visualized was unrealistic. GOE could not be expected to re-allocate the necessary funds for CONACYT before the project ever began to produce enough results to justify the political decision.

#### 4. Technical Assistance

The design of the project called for a significant amount of technical assistance of various kinds. This assistance was viewed as necessary for the successful implementation of the project and for the formation of long-term linkages between the RTTS and Title XII institutions. This aspect of the design is very realistic and commendable. However, the mechanism used is that of the commercial purchasing of services. This fails to recognize a) that linkages are interpersonal relationships at base, b) that the purchasing of services is an expensive way of accessing Title XII universities and c) that the probability of a linkage established this way lasting after Ecuador becomes an AID graduate country is relatively low. Given the resistance to U.S. technical assistance on philosophical grounds, this method of accessing Title XII universities has an almost "self destruct" quality to it.

#### 5. Training

The project design also calls for a very significant amount of training at all levels within the RTTS. One description of a less developed country is a severe deficiency in trained personnel. Furthermore, several studies have shown that this is the element of outside help in which AID has a large comparative advantage over other donor agencies. The unfortunate aspect of the design with respect to training is that it is too tightly tied to subprojects. This imposes a number of severe handicaps on the project. It limits the selection of persons to be trained. It robs the subprojects of talent just at the moment when they are trying to get underway. It increases the apparent cost of the subproject disproportionately and its management is fractionated and scattered.

Since this is a project of national scope, there is little reason to tie training too closely to specific subprojects. A TRAINING SUB-PROJECT would serve a much better purpose, particularly if subprojects were given preferential consideration in its operation.

B. EFFECTIVENESS OF THE DESIGN

1. Organization by subprojects

The process of allocation of funds to subprojects submitted by collaborating institutions has had some very beneficial effects. Several institutions have been encouraged to develop initiatives in the areas of technology generation and transfer with special reference to small farmer problems. These institutions have gained experience and have broadened their perspectives in the process of developing project proposals and in implementing the activities. Many student theses have been supported which brought them into intimate contact with small farmer problems. Some useful technology that is applicable to small farmers has been generated, tested and transferred in local areas. Several institutions have added technology transfer as an element of their own institutional responsibility, giving them an increased sense of commitment to the small farmers of the area. The greatest weakness in effectiveness of this aspect of the design is that rarely has the implementing institution been able to acquire additional counterpart funds. Therefore, they have either robbed other activities in the institution or have failed to comply with the agreement. This could have been anticipated in designing the subproject approach.

2. Administration

The administration of the project has been the least-effective aspect of the project. Since everything depended on the effectiveness of CONACYT in deciding which institutions should be incorporated into RTTS, what subprojects fitted national priorities, what help was needed in developing proposals and in implementing subprojects, how needed equipment could be obtained, how training was to be facilitated, etc., the entire project has been seriously crippled by the ineffectiveness of CONACYT.

3. Financing

The effectiveness of the design with respect to financing has been very limited in two respects. The lack of counterpart funds both in CONACYT and in collaborating institutions has been serious. It cannot be known whether this lack of funds is due to a genuine inability of Ecuador to provide them, or whether this project

or CONACYT simply did not have adequate political influence to cause GOE to allocate them. The result is the same. The design could have anticipated this problem and made provision either to proceed without these funds or to stop the project as soon as it became apparent that they would not be forthcoming.

#### 4. Technical assistance

The effectiveness of the design in providing technical assistance was quite good in the early phase of the project. It began to lose effectiveness, however, when CONACYT became organized and began to show real need of assistance in the management of RTTS. It is well-known that it is much easier to supply technical assistance at the technician level than at the administration level. Many publications have documented the problems, the delicacies, the approaches and the pitfalls in attempting to supply technical assistance to top management. There is little evidence that this has been adequately addressed either in the design or the implementation of technical assistance.

This, perhaps more than anything else, accounts for the poor progress of the project in the past 18 months. Unfortunately, this is a deficiency that cannot be corrected without major surgery in the project.

The nature of the contract with UF has been a serious contributing factor to the ineffectiveness of TA to CONACYT. AID's experience worldwide with host-country contracts for TA has been disastrous. Yet this contract contains most of the inoperable elements of a host-country contract. It can only sow seeds of bitterness and discontent when the host country feels obligated to defend the high cost of international TA within its own fiscal operations. It is only surprising that UF has lasted this long under such a contract.

Technical assistance in the subprojects has been effective, where it was made available, but the deficiency at top management level has severely restricted the adequate use of TA elsewhere.

#### 5. Training

The effectiveness of training has been uneven. At the management level of CONACYT it has been virtually nonexistent, and this has affected the quantity and quality of training in the subprojects. Furthermore, the

timing of training within subprojects has made project implementation difficult. Since this is the very substance of institution-building, the design for training must be much more imaginative.

6. Impact on institution-building in the institutions of RTTS

The project design has had a very positive impact on strengthening several of the institutions where subprojects have been allowed to proceed with relatively little control and restrictions. For example, the University of Ambato has demonstrated a gratifying improvement in various aspects of its food technology program. The enthusiasm of the students connected with the program reflects a genuine emergence of a philosophy of undertaking practical activities that can serve the rural agricultural community. The excitement displayed in most of the PIP's of INIAP indicates genuine strengthening of that program. These positive experiences suggest that the basic idea of supporting such activities via RTTS is tenable where the local management is strong enough to proceed in spite of the restricting influences of CONACYT.

Looking at the overall impact of the design in strengthening the RTTS institutions leaves much to be desired. The impact on the managing entity has been ineffective or negative. This, in turn, has affected adversely the potential impact on the collaborating institutions. It has established a climate of distrust and bitterness that is counter-productive.

VI. SUBPROJECTS

Ten of the twelve subprojects were visited. These were:

1. Investigation and Development Adapted to Small Farm Agriculture, IDAPA, INIAP
2. Soil Conservation and Water Management, COMSA, INIAP.
3. Study of the Agrarian Structure in Ecuador, IERAC.
4. Evaluation, Conservation and Development of Technology for Natives Cultivars on the El Oro Province, UTM.
5. Inventory, Biology, Damage Evaluation, Population Dynamic and Control of Agricultural Pests, UTM.



6. Prevalence Determination of Endemic Foci of Brucellosis and Norms for Control, UTM.
7. PITALPRO, UTA.
8. Technology Transfer Appropriate for the Artesan Fisheries Sector, INP.
9. Fisheries Research and Production on an Experimental Basis of Native in Exotic Species in the Guayas River Basin, ESPOL
10. Alternative Technology for the Food Production Based on Fish and Tropicals Fruits, ESPOL.

Each of these will be briefly discussed. The discussions are observations only. Time and personnel constraints prevented thorough evaluations from being made. Subsequently, one of them, the project concerning Brucellosis, will be used as an illustration of possible future activities as a component of the RTTS.

A. SUBPROJECT OVERVIEW

1. Investigation and Development Adapted to Small Farm Agriculture, IDAPA, INIAP

This subproject, organized around the PIP's, is impressive as a way of doing adaptive research to formulate appropriate technology. Further, the demonstration effect of the work is of equal importance. Throughout, the focus on small farmers is impressive. The program is consistent with national objectives, is well organized, is effectively administered, and involves training for staff. More technical assistance is needed as is a program in intensive English to prepare technicians for graduate training in the U.S. INIAP is a better institution for having had the IDAPA project.

2. Soil Conservation and Water Management, COMSA, INIAP.

Known as COMSA, this project has had problems. Among these was the change in the director as a consequence of Dr. Padilla's return from his graduate program. The resulting revisions in the work plan have been time consuming. Although the project is in an area of high priority concerns for the country, progress has been slow. The project needs major training and technical assistance components. It holds promise for being an asset to INIAP in the future.

3. Study of the Agrarian Structure in Ecuador, IERAC.

Land distribution in Ecuador is terribly skewed. Land property documentation needs to be clarified. This subproject, while addressing questions related to the land tenure situation, was to be given prominent attention. The activities have been marked by leadership problems. The subproject merited long-term Technical Assistance. One of the distinguished realizations of it was the training offered to 20 technicians who were sent for short course to the Land Tenure Center in Wisconsin. The work under this subproject is lagging behind. The directions taken by the activities, started late in 1983, may be conducive to generating important information.

4. Evaluation, Conservation and Development of Technology for Native Cultivars in the El Oro Province, UTM.

This native plants subproject has moved through the collection of material phase to that of selective trials in a few areas. The contractual problems it has experienced have delayed it somewhat. Also, it has been limited by the lack of a cold storage room and vehicles. Noteworthy is the fact that the University has an interagency agreement with INIAP concerning this project. Further, UTM has created a Research Department to facilitate investigations such as this one.

5. Inventory, Biology, Damage Evaluation, Population Dynamics and Control of Agricultural Pests, UTM.

Another subproject at the University of Machala funded by the project concerns insect control. One of the positive aspects of the subproject has been the involvement of students which has resulted in several B.S. theses. Unfortunately, the subproject has been plagued with problems. These have primarily concerned personnel and have included changes in the project director, technical assistance and training. Other problems have included the lack of vehicles, equipment and trained manpower.

6. Prevalence Determination of Endemic Foci of Brucellosis and Norms for Control, UTM.

The third and final project at the University of Machala is the Brucellosis Subproject. It is in its final phase, with publications in process. The study shows that the disease is rather widespread, resulting in a

significant human health hazard. Project problems have included the lack of vehicles and equipment as well as delays in the flow of funds. Like the insect control project at the same institution, this project has presented an opportunity for students to be involved. (See the B section of this chapter for additional discussion concerning Brucellosis).

7. PITALPRO, UTA.

Assets of this project include sound technical and administrative leadership, involvement of students, relevant research for the region served by the university, effective use of technical assistance and training, linkages with other government agencies and industry, strengthening of the university via acquisition of equipment, and performance of the information dissemination function. As was the case for several other projects also, this one benefitted from the project directors meeting that CONACYT sponsored.

8. Technology Transfer Apropriate for the Artesan Fisheries Sector, INP.

After getting off to a difficult start, this project is beginning to gather momentum. The programs for fishermen in local areas emphasize the use of indigenous materials. New products are being developed to utilize the total fish catch more efficiently. Effort is being made to utilize technical assistance and training. A major problem is the slow rate at which the funds are flowing.

9. Fisheries Research and Production on an Experimental Basis of Native and Exotic Species in the Guayas River Basin, ESPOL

This ambitious subproject is clearly focused on generating and extending information to small fishermen. Considerable progress has been made toward accomplishing these objectives in a relatively short period of time. Long-term technical assistance has been obtained, as has land for training and research purposes. The project is well planned. The program has added to the breadth of the host institution, ESPOL.

10. Alternative Technology for the Food Production based on Fish and Tropical Fruits, ESPOL.

This project is related to the economy's most rapidly growing sector. It attempts to train people at the

technician level and develop technology for reducing post harvest losses in the food industry. Unfortunately, delays have characterized the project. These have included initial funding, equipment acquisition, and development of the pilot plant. Plans call for a modest amount of technical assistance and the involvement of students in the project. The total program of ESPOL has been enhanced by this subproject.

B. BRUCELLOSIS. An illustration of a Potential Component of the RTTS

The Brucellosis subproject constitutes an excellent illustration of a potential component of the RTTS. It provides an example of possible technology transfer at both the national and the international level. Elaboration of both is in order.

Although the estimates of the incidence of Brucellosis in the study area are somewhat variable due to the test used during the field study, substantial evidence suggests that the disease is relatively common. It is especially dangerous on small farms where milk is more likely used from the farmer's own cows than in urban areas where milk is purchased from dairies which are likely to pasteurize it. Further, within the farm families probably the children are at greater risk than the adults if their consumption of milk is higher than that of adults, as is frequently the case. Since the disease is transmittable to humans via milk, the human health risk of the disease requires that remedial action be taken.

Via international transfer of technology, a three-phase program is worthy of consideration. Once imported, the technology for these would become a part of the RTTS. The three phases can be briefly summarized. First, a national campaign to teach families to boil all unpasteurized milk before consuming it could be undertaken. This short run solution could be followed by a longer run campaign of calfhood vaccination. Finally, these preventative measures could be supplemented by a national testing and, if necessary, control program, i.e., slaughter of all animals which test positive for the disease.

Much technology is available from international sources concerning these remedial measures. Three aspects are noteworthy. First, medical knowledge and appropriate pharmaceutical supplies are available. Second, medical

expertise required to do such things as modify vaccines for Ecuadorean conditions, if needed, exists in Title XII universities. Third, experience in conducting national animal health campaigns is available. Suffice it to say, this project illustrates very well the potential for the international transfer of technology to deal with problems of small farmers, among others.

The transfer of this technology will necessitate two changes in the RTTS. First, subprojects must go beyond the research phase if the transfer of technology is to be complete. An extension dimension is imperative if the project is to be transformed from a cluster of research subprojects into the type of RTTS originally envisioned. Second, a willingness to use technical assistance and training must be manifested. The opportunities for utilizing these exist in Title XII universities. The project is funded to do so. Only philosophical differences may prevent these remedial measures from becoming a reality.

The opportunity cost of not following the initial subproject with a remedial program is quite high. Unfortunately, it can be estimated in terms of probabilities of a substantial number of people, probably mostly children, becoming ill as a consequence of not remedying the problem. A nation needs to ponder long these costs while being guided by political/philosophical criteria, among others, in the design of projects. Further, the spread effects throughout the population of such remedial measures should be considered in estimating the benefits in the project selection process.

## VII. DEVELOPMENT OF PRIVATE SECTOR RESEARCH

### A. Present Situation

The Project Paper for the loan-add-on provides for a private sector research and development (R&D) account in the amount of \$300,000. These funds are to be used for the co-financing of private sector R&D projects. The focus of attention envisioned for these projects is especially in the area of processing and marketing technology development. This area is of special importance in small farm agriculture where marketing of small quantities of variable quality commodities by individual farmers creates special problems. Unfortunately, to date none of the funds have been spent. In fact, the selection criteria and operating procedures,

conditions precedent to the disbursement of these funds, have not been developed yet.

## B. Potential for Development

A substantial number of opportunities exist for funding in this area. The development of these opportunities is crucial for a favorable economic existence for the small farmer. For example, a small orchard is of little value if the fruit rots on the trees for lack of a market. Likewise, a small field of beans can perish for lack of proper insecticides applied when needed. As both of these illustrations suggest: 1) special economic problems exist for marketing firms when volumes are small and 2) the opportunities exist both on the input side and on the product marketing side of the production process. Each of the latter is worthy of elaboration.

### 1. Input Marketing Project Potential

New technology inevitably means new inputs are required. In many instances, credit is needed to finance them. The question is how to provide these at a reasonable cost to the farmer yet in a manner that is economically viable for the marketing firm. For example, loans to groups of small farmers represent one way of reducing loan servicing costs for lending agencies so that small farm credit can compete with other potential uses of loan funds. Provision of purchased inputs on a timely basis is essential for modern technology to be profitably used by small farmers. That will only be done if the marketing firm can do so on a profitable basis. Hence, economic feasibility studies of such things as small farmer lending; fertilizer sales to small farmers; agribusiness marketing of improved seeds, agricultural chemicals, and farm implements are of utmost importance to the functioning of a technology transfer system. As technology is generated by the various research subprojects, numerous opportunities will arise for new ventures in these input markets. For obvious reasons, these ventures will be of a high risk nature. These are ideal for the use of the designated funds.

### 2. Product Marketing Project Potential

Perhaps even more needed than input economic feasibility studies are those concerning product marketing. Unique problems plague small farmers in this area.

Their small volumes of products make assembly costs high. The variable quality of their output makes special efforts in quality control essential in the marketing chain. Transportation costs are high especially when small volumes of perishable products are marketed. Efficient operation of processing plants depends upon a supply of raw material delivered on a sustained, dependable basis. Suffice it to say, numerous economic feasibility studies are needed in order to make the private sector agribusiness community serve the needs of the small farmers.

Further emphasizing the need for marketing feasibility studies is the tremendous potential for penetrating both national and international markets with Ecuadorean agricultural products. For example, the potential for marketing the wide range of fruits (many of which could be produced by small farmers) either in preserved state or fresh on either the national or the international market is tremendous. However, market penetration is both expensive and risky. Hence, feasibility studies are essential before such attempts are made. Unfortunately, valuable time has been lost by virtue of the fact that none of the economic feasibility studies have been funded.

#### C. Recommendations

As part of a major training effort which will be described in the next chapters, a substantial effort should be made to prepare personnel for the economic feasibility studies that will be needed. Especially as the technology generation system becomes more functional, the opportunities for serious economic feasibility studies will increase markedly. Hence, the time to prepare the human capital for such a new set of both studies and marketing opportunities themselves will be in the next two years. These will not only be important for their own sake but also for the induced effect they will have on the small farm sector of Ecuadorean agriculture.

### VIII. OVERALL EVALUATION OF PROJECT

#### A. OBSERVATIONS

1. An effective institutional infrastructure is an absolute essential to agricultural development, and technical training is the very core of effective institution building. Hence, the basic objectives of the

project are excellent. They form a feasible approach to agricultural development in Ecuador. Thus, AID and GOE would be hard pressed to find better ways to invest in agricultural development. There are many reports that document the lack of trained personnel as one of the chief limiting factors in development in Ecuador and this project addresses that deficiency.

2. The design of the project anticipated the strengthening of the institutional infrastructure via the formation of an informal system that would support collaborating institutions in certain subprojects. That aspect of the design is feasible if it can be made to function efficiently. The design also visualized the formation of an administrative unit which would have the experience, the political support and the technical capacity to implement the project. In the design the effectiveness of this new administrative unit would almost totally determine the effectiveness of the entire project. This latter aspect of the design proved to be completely unrealistic. It was not possible to create, staff and support such an effective administrative unit with the very scarce economic and human resources available in Ecuador. Therefore, the deficiencies in the basic design of the project essentially doomed it to failure, and any effective realization of the objectives can only be expected through major surgery on the design.
3. The Administration of the project has encountered difficulties from the very beginning and this is basically caused by the unrealistic nature of the design. The inadequacies have been compounded to the point that the project is at a virtual standstill. It is useless to continue documentation of weaknesses when major alterations in design are indicated.
4. Any major redesign of the project will have to address much more directly and explicitly the lack of trained personnel as the chief limiting factor in agricultural development in this country. It is believed that such a redesign of the project could change the project into an effective medium for forming and strengthening an RTTS. Tying training closely to subproject implementation has imposed severe limitations on both. It is quite feasible to redesign the project so that both training and subproject implementation could proceed relatively independently with advantages to both.



B. CONCLUSIONS

1. It is concluded that the RTTS project should either be terminated or drastically redesigned. It would throw good money after bad if AID attempted to correct the major weaknesses exhibited by the project at present by simply attempting to improve activities as now visualized.

There are enough positive results among the several subprojects to opt for design modification rather than termination. Seeds of hope and sparks of interest are to be found, and it would be a severe set-back to the entire RTTS concept to terminate now. The possibility of effective redesign within the bounds of existing financing is sufficient to encourage that option.

2. A redesign of the project should address more directly and explicitly the most critical needs of RTTS and of Ecuadorean agriculture, namely technical training at several levels. It is concluded that as this aspect of the project prospers, the other aspects will follow much more efficiently and the project will enjoy stronger national support and acceptance.
3. The new government of Ecuador which will take office next month is already attracting large sums of additional external financing for the development of the agricultural sector. This will make further demands on the already short supply of trained personnel and on the RTTS. Thus, it becomes even more urgent for this project, which is already in place, to modify its design to better serve this larger purpose by drastically increasing the effectiveness of the technical training component.
4. It is concluded that it is feasible to redesign the project so that it would:
  - be politically attractive to the new government
  - not require excessive counterpart funding in the near term
  - contribute strongly to the RTTS
  - serve other externally funded projects within a short period of time
  - make linkages with Title XII institutions attractive and productive

C. RECOMMENDATIONS

1. It is recommended that the project be redesigned quickly along lines that would make technical training the leading edge of implementation.
2. Retain and strengthen the concept of RTTS. Identify a limited number of institutions which will form the primary group in which investments will be made. (For obvious political reasons this cannot be an exclusive list). Draw from this primary group an advisory council (concejo) that will assist and advise in the allocation of resources from the project and in the selection and approval of future subprojects.
3. Retain and strengthen most of the subprojects now in operation rather than lose whatever momentum has been generated to date.
4. Reconstitute the administrative services to the project. Select the most suitable institution among the RTTS to perform the administrative chores for the group. Consider this addendum to the selected institution as a temporary (5 years?) responsibility pending GOE decision as it considers this as well as other institutional requirements. Give this temporary addendum project support to enable it to serve the RTTS with importation problems, coping with Ecuador and AID fiscal requirements, etc., etc.
5. Reconstitute the contract for technical services. The redesign of the project would place much greater demand on the technical services contractor for logistical support in conducting short courses in the country and in sending participants to short courses and degree programs abroad. The need for TA directly to the management component would be greatly reduced, the need for language training would be added, etc. It is even possible that assistance in identifying appropriate equipment and materials sources of supply and getting bids, etc., could be greatly facilitated through that contract.

In reconstituting the contract it should be strictly AID/Title XII institutions without the debilitating elements of a host country contract that plague the present contract.

6. Consider a new design that contains the basic properties of the following:

- a. Flood the RTTS with short courses to which members could send their technical personnel. Topics and sites for short courses would be selected primarily from requests from member institutions.

Publicize the lists of short courses among RTTS and invite applications for participation as well as pay travel and per diem from project funds. Use seminar experts as consultants to subprojects.

Objective: Stimulate interest among the technical personnel of RTTS and provide instruction not normally available to most of them.

- b. Develop a list of short courses of 1-3 month duration in the U.S. or other eligible countries. Make the list available to RTTS and invite applications. Many in USDA and elsewhere do not have language restrictions. Update calendar of offerings monthly. Budget a significant number of participants (50?) each trimester. Pay travel and per diem from project funds.

Objectives: Provide further incentive and stimulation to technical training as well as increase the base of selection for further training. Enhance technological base of RTTS.

- c. Budget significant number of degree training becas (50?) per year; invite RTTS institutions to nominate candidates. Title XII contractor will assist in application for admission to appropriate graduate school, logistical support, and re-entry into RTTS. Arrange that most thesis and dissertation research be performed in Ecuador under joint supervision of major professor and RTTS scientist. Budget travel for major professor for this purpose; use major professor for seminars, T.A., etc. while here.

Objective: Increase the base of well trained scientists in Ecuador that can be used where needed most in RTTS.

- d. Provide for English instruction and practice through Title XII contractor, to be offered at RTTS institutions.

- e. Provide a system of "re-entry" of becarios with new degrees. This consists of relocation in RTTS program, small project fund to develop subproject proposal, etc.
7. Consider funding of new subprojects after two years of operation of the above training program.

IX. TOWARD REDESIGNING THE PROJECT

This section addresses three issues. The first is the method for identifying the new lead institution for the RTTS. Subsequently, an overview of the training program will be provided. Finally, a procedure for identifying areas for further research will be suggested.

A. Criteria to Select the Lead Ecuadorean Institution

The choice of a lead institution has been somewhat difficult ever since the project was conceived.

MAG, INIAP and SEDRI were all considered and probably ranked at about the same level of possibilities. The fact that the RTTS was conceived to have a wide range of actions and would require the interaction of a broad spectrum of institutions kept it from being installed in any of the three mentioned above.

As the question returns to be considered, rather than appointing a single place which could host and develop RTTS, the evaluation mission organized a series of criteria which could be used to select the most appropriate environment to guarantee that the system will grow and develop.

The criteria selected are related to the required characteristics an institution should have in order to facilitate the implementation of the RTTS.

Each criteria could be used for evaluation purposes through one or a group of indicators.

Having obtained the distribution of the indicators, relating to the likely candidate institutions, the choice of the lead one should be free of any possible bias.

Data for direct measurement of alternative institutions with each of the above criteria may be impossible to obtain. However, a number of indicators of

proxies for these criteria will be suggested. In the event that more than one proxy for which data are available is given, all of them can be used in ranking the alternative institutions relative to each other for the criterion.

The suggested criteria and indicators are:

Criterion 1

Attitude toward training

- Indicators I<sub>1</sub> = Number of technicians on the staff with Ph.D. training in an agricultural discipline/Total number of technicians
- I<sub>2</sub> = Number of technicians with M.S. degree in an agricultural discipline/Total number of technicians
- I<sub>3</sub> = Academic degree of the Director (Ph.D. = 4, M.S. = 2, Professional = 1)
- I<sub>4</sub> = Number of technicians trained at graduate level in the last five years/Total number of technicians
- I<sub>5</sub> = Number of technicians who attended one or more formal training course during 1983/Total number of technicians.

Criterion 2

Attitude toward technical assistance

- Indicators I<sub>6</sub> = Number of foreign technicians on staff
- I<sub>7</sub> = Number of seminars held with the participation of foreign speakers in 1983
- I<sub>8</sub> = Number of technicians on staff who served in a technical assistance capacity during 1983/Total number of technicians.

Criterion 3

Capability of interacting with other institutions working with RTTS

- Indicator I<sub>9</sub> = Number of technicians on staff involved with other RTTS institutions/Total number of technicians

I<sub>10</sub> = Number of written linkage agreements relative to size of 1983 budget

I<sub>11</sub> = Number of projects conducted jointly with other institutions/Total number of projects

Criterion 4

Political prestige of the Institution

Indicator I<sub>12</sub> = Annual rate of increase of the real value of the institution budget for last 5 years

Criterion 5

Scientific activities in general

Indicators I<sub>13</sub> = Number of technical meetings per month involving the technical staff/Total number of technicians

I<sub>14</sub> = Total number of publications of the technical staff within last five years/Total number of technical staff members

Criterion 6

Administrative support to technical activities

Indicators I<sub>15</sub> = Number of administrative personnel/Total number of technical staff

I<sub>16</sub> = Highest wage paid to technical staff member/Highest wage paid to administrator

I<sub>17</sub> = % of budget actually spent in 1982 and 1983

Criterion 7

Ability to manage programs on a timely basis

Indicators I<sub>18</sub> = % of budgeted expenditures to be spent to date actually spent

I<sub>19</sub> = % of 1983 budget spent in last month of fiscal year

Criterion 8

Experience managing internationally funded projects.

Indicators I<sub>20</sub> = % of 1983 budget from international sources

- I21 = % of present projects at least partly funded by international sources
- I22 = % of 1983 international budget donors who had funded at least one previous project in the institution

Criterion 9

- Willingness of institution to accept responsibility
- Indicators I23 = highest academic degree of person designated to serve as project director
- I24 = years of experience in professional agricultural employment of designated project director,
- I25 = budgeted amount for staff and support for project administration

Criterion 10

- Ability to extend technology to farmers and other users
- Indicators I26 = % of total technicians involved in generating technology
- I27 = number of publications extending technology to users/Total number of publications in 1983
- I28 = number of field days/Total number of organized meeting in 1983

Having obtained the needed data for all the institutions involved, they may be analyzed using one of the available methods of cluster analysis which would generate indices by which the institutions would be ranked.

The use of the principal component method, for example, will generate robust indices that could be used to rank the institutions according to their possibilities of hosting the RTTS.

In computer facilities are not available or very incomplete data must be used, a less rigorous methodology may need to be used. If that is the case, the alternative institutions can be rank ordered by each criterion. Weights for each criterion need to be determined by GOE and USAID, the joint decision makers in the process. Subsequently, the weighted rankings

could be summarize for each institution. Their scores will indicate which is the preferred lead institution.

B. Initial Ideas about the Training Subproject

The lasting impacts of a Technical Assistance program will depend on technical capabilities it develops in the host country. The capability to develop and transfer technology requires trained personnel at different levels and in different areas.

The provision of training opportunities is itself to be geared toward the needs of the personnel to be involved in the process. The kinds of technology to be transferred, or developed, ought to be related to the limiting techniques or inputs of the production or marketing activity involved.

The training subproject, which has been proposed, will contemplate the possibilities of short courses as well as formal degree courses at the MS and PhD levels.

As a component of the RTTS effort, the training subproject may represent an opportunity to integrate the human resources of the participating institutions. This can be done at the preparation stage as well as during the courses themselves.

1. The Short Course Programs

At the preparation stage it will be in the interest of Ecuador to consider the possibilities of offering courses in the country. Short courses are the natural starting point. Depending on the subject matter to be offered, it is likely that combinations of staff of the different institutions will be necessary.

At the planning stage the institutions to participate should be invited to discuss the course needs and the feasibility of offering them.

The disciplines that make up the courses as well as their contents will be put together by the professors and the researchers sharing the events. The literature to be discussed also should be defined, and, as much as possible, should draw on the available material relevant to the country. This relevant material may have been authored by Ecuadorean scientists or might come from international sources.



In this process, one usually discovers that there is an abundant supply of knowledge to be integrated. Ecuadoreans have been sent abroad for training for considerable amounts of time and, hence, have contributed significant amounts to the literature that will be used. The experiences developed at their respective institutions when combined will probably impact the professionals that prepare and offer the courses and the ones enrolled as well.

This impact will be the first outcome of the interaction of the professionals involved. It increases their mutual respect and enhances their propensity to work together. The improvement of the technical ability of the professionals enrolled is another natural outcome to be expected.

For the students enrolled in the short courses, granting certificates of participation may represent additional stimulus.

The short courses will offer an adequate opportunity for selecting the candidates for the degree programs. They may also become a step in the strategy of creating graduate programs in Ecuador. Continuing the integration of resources of different institutions for training at the graduate level will represent the removal of bottlenecks which keep the individual institutions from starting the programs by themselves.

The sequence from short to graduate degree courses has been shown to work effectively in other TA programs. The Purdue University project at the Federal University of Vicosa provides an example in which the suggested process succeeded very well.

The graduate courses in the areas of Agricultural Economics, Horticulture, Soil Sciences and in Forages that have developed into Doctorate programs all grew up at the Vicosa University from short courses in these areas.

The implementation of short courses at specific institutions will also have parallel demonstration effects. These will induce the development of other areas.

The idea of short courses and the opportunity to offer them to the professionals that participate in the RITS effort should also be explored using the opportunities available in other countries.

The International Agricultural Research Centers offer short courses in which some Ecuadorean institutions have participated. Further use of this option should be contemplated, specifically the courses available in Latin America.

Title XII Universities also offer short courses which will be of interest to RTTS. Some of these might be offered in Ecuador in Spanish.

It is also recommended that the U.S. Department of Agriculture short courses be considered as possibilities in the short course program.

## 2. The Degree Program

While short courses are seen as a possibility to expedite the upgrading of professionals, it is also recognized that some of the needed scientists will have to be provided via formal MS and PhD programs.

In the short and medium runs, RTTS will have to depend on the available and regularly used graduate degree programs.

Where language is an obstacle, one could rely upon Latin American Universities for graduate training.

Training in U.S. Universities is expected to constitute the bulk of the capacitation subproject. As a preparation for that, the institutions involved with the development of RTTS are urged to set up a language training program. That program should be a very intensive one, using a saturation approach. EMBRAPA's experience in Brazil is an example of how to succeed with this approach.

While the whole process is cumbersome, it is to be recognized that a degree from an English speaking university is highly valued.

The Tunisia Technology Transfer Project can serve as a model for the entire degree program. Especially the host country research component will serve as a good illustration of how linkages can be forged in a technology transfer project with Title XII universities.

3. The Technical Assistance Component of the Training Subproject

The take-off of the RTTS activities has been plagued by the remarkable resistance that its host institution has in regard to both Technical Assistance and training.

To the extent that this resistance may exist in other participating institutions, it will be the responsibility of the personnel in charge of providing the Technical Assistance to overcome the obstacles likely to appear.

The University of Vicosa program mentioned above and the progress it made in some specific academic areas in Brasil provide good examples of circumstances in which the Technical Assistance inputs can be used to overcome resistances. The short courses layed the ground work for the implementation of the activities intended in the short run and for further progress as well.

Sometimes, as was the case in Vicosa, it will be required that the experts, to be involved as Technical Assistance personnel, be available within the host unit to prepare for the short courses, even in the early stages of planning.

The training subproject component to be installed within Ecuador will be important for the short courses offered in the country as well as for providing support for degree programs abroad.

Its implementation will require that the University of Florida Mission work with the institutions participating in the RTTS effort to determine how best to go about eliminating or by-passing existing obstacles. Considerable amounts of attitude changing at a variety of levels within a number of institutions will be necessary.

Many of these attitude changes will be strongly influenced by the quality of the staff and by the work of the University of Florida Mission.

C. A Method for Identifying Research Priorities

The research effort to be developed by R/Is will encounter areas which have not been touched before by

agricultural research in Ecuador. Problems to be resolved with the use of Agricultural Sciences range from adaptive research, i.e., adaptation of technology developed in other countries to Ecuadorean circumstances, to problems inherent to the country's agro-climatic technological needs.

Due to the fact that institutionalized agricultural research is recent in the country, the problems to be approached are numerous and of varying complexities.

In such circumstances, it is advisable that the research resource allocation process be guided by sound criteria of priorities, in order to make the resources involved afford highest returns.

The pertinent literature contains various approaches that can be used to allocate research resources.

One basic orientation which could be used is based on general goals of the Ecuadorean society. Three such goals are useful in organizing basic ideas to orient the allocation of research resources. These are: growth, equity and security.

Economic growth is the predominant objective to orient technological investments and technological change. Growth is fundamental in defining the investments in agricultural research. Problems of equity arise when one considers who is being benefitted by the results of technological change.

Considerations around security lead the research policy-makers to distribute their resources in such a way as to generate results over a wide range of opportunities. There will protect producers, consumers and the whole society from the dangers of specialized investments which leave them vulnerable to specific problems in one activity or another in which technological development has been concentrated.

Growth, equity, and security are the guidelines for agricultural research at the Iowa State Experiment Station in the USA. Considerations around these basic lines were also instrumental in providing the initial definitions of the products and problem areas that guided EMBRAPA's initial research efforts in Brasil.

It is proposed that the RTTS, while establishing its lines of research investments, also orient its efforts according to these three objectives.

## 1. Growth

The growth objective of the research investments will induce efforts going into products which employ more resources, are important in making-up the farmers' income, generate higher amounts of foreign exchange, and substitute for more expensive imports.

To orient research efforts according to the growth objective, one would examine the agricultural resource allocation among the various crops and livestock.

The agricultural enterprises would then be ranked according to the agricultural land allocated to each activity. The total labor input allocated to each activity would also serve as a ranking procedure. When possible, the amounts of capital required by each activity should be considered also.

The amount of income generated by each crop and livestock activity will depend on the destination of each. Products sold in international markets tend to generate higher incomes for the producing country, at the same time they generate foreign exchange reserves.

Along this line, the higher the participation of a product in a country's exports, the higher research investments it ought to merit.

Developing countries often spend sizeable amounts of their foreign currency on food items or other agricultural commodities. It is possible that through well combined research efforts, a country may substitute for home produced food some of its imports.

By examining the imported goods of a country it is possible that one finds that via research investments one increases internal production of previously imported agricultural products. In turn, this releases substantial amounts of foreign reserves at the same time that internal income may grow by lowering food prices, improving producer income and increasing employment within the country's depressed areas.

## 2. Equity

The question of equity also is a multi-dimensional one. It deals with the effects of the improved technology on the internal income distribution of the country.

The first dimension to be considered deals with the income effects on consumers versus producers.

If the target product has a price inelastic demand, the increases in the quantity produced caused by the new technologies will make its price drop more than proportionally to the increase in quantity. In this case, consumers will benefit more from the research results than producers. Contrarywise if the product has a price elastic demand, the producers primarily will be benefitted.

Within the groups of producers and consumers equity considerations demand further analysis of the expected incidence of benefits. For example, among the agricultural producers, primarily small farmers will receive advantages of research that increases the productivity of the resources they use more intensively, i.e., labor. Research results that augment labor productivity will tend to make this group better off.

On the consumer side, research investments in food crops will tend to benefit low income consumers.

Equity objectives in countries such as Ecuador require consideration of the regional distribution of the expected research results and, hence, expenditures. For example, technology to be developed to improve agriculture in the Sierra region should differ from that for the low coastal region.

### 3. Food security

Food security considerations address the question related to the needs of balancing the research investments among the crops and livestock that make up the overall agricultural sector.

The idea hinges around the need to protect the producing sector against risks and uncertainties of allocating large amounts of resources to a few alternatives. Unexpected causes may depress the results obtained from such alternatives and the income effect of productivity increases, generated by the new technology, may not be captured.

The unexpected causes may range from physical phenomena reducing production to marketing elements that may depress selling prices.

#### 4. The Systems Approach

Growth, equity and security consideration can be used to define the commodities to receive differentiated resources from research organizations; and also to indicate which factors should have their productivities increased.

The research effort will then have to be directed to specific techniques in the production process of the selected commodities.

The systems approach, through which the process of production is analyzed in its integrity, provides a useful technique in pinpointing the limiting constraints to production increases.

With the use of systems analysis, the research team can detect the production processes that have not been researched yet. It also can clarify the areas in which the recommendations of different specialty areas differ.

The approach also allows bringing into consideration, in addition to the biological production process, other factor. For example, farmers' attitudes toward profit's, risks, and so on, may affect their reactions to new technologies. These are elements to be considered when a research team is trying to identify the limiting constraints to production increases.

EMBRAPA in Brazil has had examples in which the assumed farmers' reactions changed completely the research priorities proposed by biologists.

Within the Ecuadorean conditions, the IDAPA subproject suggests a possible application of the systems approach.

The PIPs, as they are called, represent the closest idea to a laboratory in which priority identification can be effective and as accurate as can be conceived.

#### 5. Identification of Priorities with Research Teams

The research priorities, in terms of the specific technologies to be developed for specific crops or livestock, can also be approached by bringing together the scientists working with the crop or livestock concerned.

These scientists, in round table discussions, can be asked to elaborate their experiences, exchange their knowledge, and share their perspectives. At the end, they will agree about the missing links in the improved technology chain. These will constitute the definitions for the research program for the crop or livestock analyzed.

Such an approach also was adopted in Brazil while EMBRAPA was defining its research program and building its research centers.

#### 6. Final Comments

The idea of defining research priorities is in itself plagued with uncertainties. The goal orientation suggested, according to which growth, equity and security considerations are starting issues, may lead into more complicated problems if one takes a more general equilibrium type approach. For that reason, one has to be careful about how to deal with the problem.

Economic analysis of the research resource allocation process provides numerous methods and approaches to deal with related questions, at varying level of difficulties. Having a group of people analyzing the likely economic implications of the research in process, or to be undertaken, usually prevents major misallocations.

Accurate analysis of the overall process requires a volume of information which may not be available in some developing countries. This is an obstacle difficult to overcome, but it needs to be tackled.

The evaluation team did not have opportunities to get acquainted with the Ecuadorean data base. One is not sure of what can be done. Nevertheless, it is important that people concerned with RITS be aware of the concepts involved and take them into consideration.

These ideas become of particular significance at this moment when the implementation of RITS is to be redesigned.



APPENDICES

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APPENDIX 1

Terms of Reference

RTTS Project Evaluation

Under Section 6.1 of the Project Agreement, periodic evaluations are to be carried out which assess progress toward meeting the project outputs and purposes. These evaluations are considered an integral part of the project, and necessary for identifying constraints and appropriate solutions in a timely manner.

The first evaluation conducted in March 28-31, 1983, focused primarily on outputs. Six important problems areas were identified and several recommendations were acted upon. These fundamental issues, upon which the project is based, form the basic focus for this evaluation. The project purposes and objectively verifiable indicators presented in the project's log frame and the Project Loan and Grant Agreements will provide the conceptual framework for this in-depth project review.

This second external evaluation will address two basic issues: the project's purpose as written vs. its purpose as perceived by the three principal implementing institutions - CONACYT, USAID/Ecuador, University of Florida, and selected Ecuadorean institutions which have subprojects financed by the RTTS Project; and the use of subprojects in achieving the project's purpose.

A. Project Purpose

The first project evaluation identified differing interpretations among CONACYT, USAID/Ecuador, and the University of Florida in the perception of the project's purpose. This is manifested at the policy level of each institution, and is particularly evident in the role of T.A. in the subproject design and implementation process. The evaluation team should review the project in terms of its continued relevance for attaining the purposes as written in the Project Agreement. This should include a review of the basic CONACYT policy documents and their operational perspective of them in achieving their institutional mandate, USAID/Ecuador's operational perspective of the RTTS Project, the University of Florida's objectives under the Project, and several subproject implementing agencies' perceptions of the project's relevance to achieving their objectives. The purpose of these reviews is to establish the legal, administrative/institutional, and policy basis for

any continuing differences which may exist in how the project is perceived by each institution. In this regard, the role and use of U.S. Technical Assistance, particularly from Title XII Universities, in the project should be discussed. This issue should be considered at three levels: personal, institutional, and governmental.

Based upon these reviews, the evaluation team will assess the degree to which perceptions differ and the implications of these differences for attainment of project objectives. The team will make specific recommendations regarding:

1. Any institutional changes necessary to achieve the project's purposes with regard to:

- a) CONACYT
- b) U. of Florida
- c) implementing agencies
- d) AID

As part of this review, the evaluation team should describe the requisite institutional operational procedures which are necessary to achieve the project's purpose. These recommendations will serve as working guidance for institutional and/or operational modifications.

2. Changes necessary in the basic project design and the consequences for CONACYT, AID/Ecuador, and the University of Florida of each recommended change.

#### B. Subprojects

The rationale for including the financing of subprojects in this project was that they are considered the principal institution-building and technology transfer vehicle for achieving the project purposes.

The evaluation team should review:

1. the role of the subproject in terms of its continued validity for achieving the project purposes;
2. the subproject selection process in terms of consistency with Ecuadorean rural development and technology transfer priorities;
3. the subproject development and approval process in terms of ability to identify critical technical

factors which insure to the extent possible that approved subprojects are well-grounded and complete;

4. the method for including the Ecuadorean scientific and research community in the project review process in furtherance of item 3);
5. the private sector research and development fund in terms of how it can be best implemented;
6. the subproject process to identify methods to expedite approval and disbursement;
7. CONACYT's subproject monitoring process in view of its ability to identify and respond to implementation constraints; and
8. the role of USAID/Ecuador, the University of Florida and Title XII universities in general in the process as part of the institutional strengthening of the principal implementing agency.
9. It is important that the evaluation team:
  - evaluate, in general terms, the impact that the project has had upon the participating institutions (Universities, the Public Sector, CONACYT, etc.).
  - analyze up to what point the subprojects are satisfying the technology needs identified in the rural sector in general and the small farmers in particular, and their consistency with the objectives of the National Development Plan.
  - evaluate the technical cooperation and training provided.
10. The evaluation team should analyze:
  - the theoretical concept, operations, and design of the Rural Technology Transfer System; and,
  - the impact that each subproject has contributed to the institutionalization of that System.

The evaluation should concentrate on the process of institutional strengthening of the Rural Technology Transfer System as well as the results of subproject activities which have been carried out pursuant to that System. As a result of the review, the evaluation team should prepare specific recommendations to address the problems identified.

- C. Finally, if a thorough project redesign is recommended, the evaluation team should propose a project outline which indicates the components required for successfully achieving the project's objectives.

The evaluation team will consist of three independent members, and be carried out through interviews with CONACYT staff, University of Florida staff, participating institutions and USAID/Ecuador; files of the project should be reviewed, periodical reports studied; and field visits made to the several subprojects as required.

Time frame for the evaluation is estimated at two to three weeks.

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APPENDIX 2

Calendar of activities of the RTTS Project Evaluation Team

July 2, Monday:

Introductory Meetings

09:00 10:30 p.m.  
11:00 12:30 p.m.  
14:30 16:30 p.m.

AID  
CONACYT  
Mission

July 3, Tuesday:

Working Meetings

09:00 12:30 p.m.  
14:30 16:30 p.m.

Evaluation Team  
AID, Agriculture and Rural Development  
Office

July 4, Wednesday:

09:00 11:00 a.m.  
Directorate  
11:00 13:00 p.m.

CONACYT, Rural Development  
Mission

Visits to Institutions and Subprojects

14:30 16:30 p.m.

INIAP, Director General

July 5, Thursday:

09:00 10:30 a.m.  
11:00 12:30 p.m.

INIAP, IDAPA Subproject  
IERAC, Agrarian Structure Subproject  
INIAP, COMSA Subproject

14:30 16:30 p.m.

July 6, Friday:

Trip to Ambato  
Visit to the PITAPRO subproject of the  
Ambato Technical University

July 7, Saturday:

Trip to Machala

July 8, Sunday:

08:30 12:30 p.m. UTM, LIAP Subproject  
15:00 Trip to Guayaquil

July 9, Monday:

08:30 10:30 a.m. ESPOL, Fisheries Subproject  
10:30 12:30 p.m. ESPOL, Food Technology Subproject  
14:30 16:30 p.m. INP, Fisheries Technology  
Subproject  
18:00 Return to Quito.

July 10, Tuesday:

08:30 10:30 a.m. Meeting with UF Chief of Party  
Group work

July 11, Wednesday:

Additional meetings and visits, information  
collection

July 12, Thursday and beyond:

Group work, report writing  
July 20, Friday Turn in final report

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APPENDIX 3

List of People Interviewed

- July 2: Darell McIntyre, AID  
Randall W. Roeser - Assistant Development Resources Officer-AID  
Patricio Maldonado - Program Officer-AID  
William Ross - Controller and Acting Director-AID  
Angel Matovelle, Executive Director of CONACYT
- July 3: Darell McIntyre, AID  
Econ. Rubén Salazar, Office Director, Rural Development-CONACYT
- July 4: Econ. Rubén Salazar DDR, CONACYT  
Ing. Rómulo Soliz and Dr. Raúl de la Torre, University of Florida  
Dr. Julio Delgado, General Director-INIAP  
Econ. Patricio Espinoza, Head of the Department of Planning-INIAP
- July 5: Ing. Jorge Rivadeneira, in charge of IDAPA-INIAP  
Ing. Anibal Saltos Subdecan of the Engineering Ambato Technical University (UTA) in charge of the PITALPRO Project.
- July 6: Dr. Washington Padilla in charge of the COMSA Subproject-Santa Catalina Experiment Station, INIAP  
Ing. José Solano-INIAP attached to the COMSA Subprojects Dr. Francisco Pérez; Consultant to IERAC, in charge of the Agrarian Reform Subproject.
- July 8: Dr. José María Valarezo-Director of the Department of Agricultural and Livestock Investigation-(DIAP-UTM) Machala Technical University (UTM).  
Dr. Vicente Gonzaga Tinoco, Project Director Pest Insects (UTM).  
Dr. Ramiro Sánchez in charge of the Brucellosis Subproject (UTM).  
Dr. Franklin Alba, Project Director, Native Cultivars  
Ing. María Gonzaga, Director to the Department of Agricultural and Livestock Extension-(DEAP-UTM)
- July 9: Marco Alvarez in charge of the Aquaculture Subproject-ESPOL, Guayaquil.  
Ing. Luis Miranda in charge of the Food Technology Subproject-ESPOL, Guayaquil.  
Ing. Ramón Montaña Cruz in charge of the Subproject on Fishing Technology Transfer, of the National Fisheries Institute (INP), Guayaquil.



Soc. Suzana López-Consultant to INP-Fishing Technology Transfer Subproject.

July 10: Dr. Kamal Dow, Chief of Party of the University of Florida.  
Econ. Rubén Salazar, DDR, CONACYT

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APPENDIX 4

Revised Documents

The following list contains the principal documents which were consulted by Mission members during the evaluation period.

The different kinds of materials read prevents the citations from being sequential, and orderly mentioned.

- AID Grant 518-0032: Project Grant Agreement Between the Government of Ecuador and the Government of the United States of America Rural Technology Transfer System-August 27, 1980, 9 pages, 2 anexes (5pp & 7pp). (English (E) and Spanish (S) versions)
- AID Grant 518-0032 - Project Grant Agreement Amendment 2 2pp (E&S).
- AID Grant 518-0032: Project Grant Agreement. Amendment 3 2p. (E&S)
- AID Grant 518-0032: Project Grant Agreement. Amendment 4 - 2 p. (E&S)
- AID Grant 518-0032: Project Grant Agreement. Amendment 5 - 2 p. (E&S)
- AID Grant 518-0032: Project Grant Agreement. Amendment 6 - 2 p. (E&S)
- Project AID 518-0032 Loan AID 518-T-041 Project Loan Agreement Between the Government of Ecuador, The United States of America, Rural Technology Transfer System. July 23, 1982 11 pp., 2 Anexes (7pp & 10pp) (E&S)
- Department of STAT -AID-Ecuador, Project Paper-Rural Technology Transfer System (Title XII)-AID/LAC/P-55 Project Number: 518-0032-Unclassified 80 pp, 7 Anexes (5pp, 1p, 4pp, 12 pp, 10pp, 2pp, 6pp, 1p)
- United States International Development Cooperation Agency, Agency for International Development, Ecuador, Project Paper-Rural Technology Transfer System Amendment. AID/LAC/P-055/1 Loan Number: 518-0032-Unclassified, Washington D.C. Amendment No. 1 58 pp. 9 Anexes (1p, 2pp, 4pp, 19 pp. 57 pp, 19pp, 19pp, 7pp, 1p)

- Whittaker M. E.; Marco, Jaramillo-First Annual Evaluation of AID Project: "Rural Technology Transfer System" held in Quito, Guayaquil, Ecuador, and Gainesville, Florida. 1983, 60 pp.
- Resumen del Estado Financiero, al 05/31/84 2p.
- Kamal Dow, Chief of Party of University of Florida - Contract USAID/Ecuador-University of Florida, for the establishment of a Rural Technology Transfer System Quarterly Report of Activites.

11 Reports.

January 1 <sup>st</sup> March 31 <sup>st</sup> , 1984	12 pp.
October 1 <sup>st</sup> December 31 <sup>st</sup> , 1983	21 pp.
July 1 <sup>st</sup> September 30 <sup>rd</sup> , 1983	10 pp.
April 1 <sup>st</sup> June 30 <sup>rd</sup> , 1983	10 pp.
January 1 <sup>st</sup> March 31 <sup>st</sup> , 1983	8 pp.
October 1 <sup>st</sup> December 31 <sup>st</sup> , 1982	8 pp.
July 1 <sup>st</sup> September 30 <sup>rd</sup> , 1982	8 pp.
April 1 <sup>st</sup> June 30 <sup>rd</sup> , 1982	7 pp.
January 1 <sup>st</sup> March 30 <sup>st</sup> , 1981	5 pp.
October 1 <sup>st</sup> December 31 <sup>st</sup> , 1981	11 pp.
June 29 <sup>th</sup> September 31 <sup>st</sup> , 1981	10 pp.

- CONACYT Dirección de Desarrollo Rural-Informe de Actividades de los Subproyectos del Sistema de Transferencia de Tecnología Rural STTR - 1981 - 1983 - 1984, 76 pp.
- CONACYT Ley y Reglamentos-Editorial Voluntad-Quito Ecuador, 49 pp.
- Project Identification Document - Rural Technology Transfer System (Title XII) Loan-Add-On, 33 pp.
- Dirección de Desarrollo Rural, CONACYT - Marco Analítico para la Selección de Proyectos de Investigación y Desarrollo Tecnológico en el Sector Agropecuario y Forestal - Capítulo III-Tipos de Proyectos y Prioridades. (mimeo)
- CONACYT - Problemas y Recomendaciones
- Guía para la Presentación de Perfiles de Proyectos a CONACYT
- Informe de evaluación del perfil No.
- Formularios de Proyectos CONACYT-Instrucciones Generales para completarlo

- Guía para la evaluación de Proyectos
- Visitas de Evaluación de Proyectos (Uso interno en el CONACYT)
- República de Ecuador - Plan Nacional de Desarrollo del Gobierno Democrático 1980 - 1984. Segunda parte Tomo 11 Políticas y Programas Sectoriales: Desarrollo Rural Manufactura y Turismo, 218 pp.
- Propuesta para el Desarrollo de un registro de los Recursos Humanos Profesionales e Institucionales del subsistema de Ciencia y Tecnología Agropecuaria Forestal y Pesquero 1984, 14 pp.
- Propuesta para mejorar el componente Técnico en la Evaluación de proyectos.
- Términos de Referencia para la presentación de Informes periódicos de progreso.
- Lineamientos de Política Científica y Tecnológica para el sector agropecuario.
- Soliz, Rómulo: Desarrollo y Funcionamiento del Sistema Nacional de Ciencia y Tecnología para el Sector Agropecuario, Forestal y Pesquero.  
  
Propuesta preliminar para un proyecto de Estudios a ser ejecutado por el CONACYT, 1983, 21pp.
- Lineamientos sobre políticas y Estrategias prioritarias de Investigación y Desarrollo Tecnológico para el sector Agropecuario y Forestal y su utilización en la selección de Proyectos.

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APPENDIX 5

List of Acronyms

CATER:	Centro Andino de Tecnología Rural (Andean Rural Technology Center)
COMSA:	Conservación y Manejo de Suelos y Aguas (Soil and Water Conservation and Management)
CONADE:	Consejo Nacional de Desarrollo (National Development Council)
DIAP:	Departamento de Investigación Agropecuaria (Department of Agricultural Research)
DEAP:	Departamento de Extensión Agropecuaria (Department of Agricultural Extension)
ESPOL:	Escuela Superior Politécnica del Litoral (Coastal Polytechnic School)
GOE:	Gobierno del Ecuador (Government of Ecuador)
IDAPA:	Investigación y Desarrollo Adaptados al Pequeño Agricultor (Research and Development Adapted to the Small Farmers)
IERAC:	Instituto Ecuatoriano de Reforma Agraria y Colonización (Ecuadorian Agrarian Reform and Colonization Institute)
INEC:	Instituto Nacional de Estadística y Censos (National Statistics and Census Institute)
INERHI:	Instituto Ecuatoriano de Recursos Hidráulicos (Ecuadorian Water Resources Institute)
INIAP:	Instituto Nacional de Investigaciones Agropecuarias (National Agricultural Research Institute)
INP:	Instituto Nacional de Pesca (National Fisheries Institute)
MAG:	Ministerio de Agricultura y Ganadería (Ministry of Agriculture and Livestock)
PIP:	Programa de Investigación de la Producción (Research and Extension Program)

- PITALPRO. Proyecto de Investigación en Tecnología de Alimentos  
(Food Technology Research Project)
- PP: Project Paper
- PRONACOS: Programa Nacional de Conservación de Suelos (National  
Soil Conservation Program)
- RDD: Rural Development Division (CONACYT)
- RTTS: Rural Technology Transfer System
- SEAN: Sistema de Estadísticas Agrícolas Nacionales  
(National Agricultural Statistics System)
- SEDRI: Secretaría de Desarrollo Rural Integral (Integrated  
Rural Development Secretariat)
- TA: Technical Assistance
- UCG: Universidad Católica de Guayaquil (Catholic University  
of Guayaquil)
- UF: University of Florida
- UTA: Universidad Técnica de Ambato (Technical University  
of Ambato)
- UTM: Universidad Técnica de Machala (Technical University  
of Machala)