



HILLSIDE AGRICULTURE SUB-PROJECT (HASP)

Centro Interamericano de
Investigación e
Extensión Agrícola
J - 141K 1895
IICA - 1107A

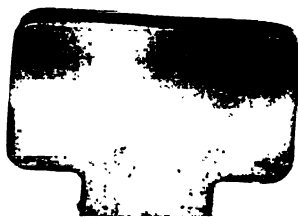
EVALUATION OF AGRONOMIC AND SOCIAL-ECONOMIC
RESEARCH (OFAR)
MINAG/IICA HILLSIDE AGRICULTURAL SUB-PROJECT
(HASP)
JAMAICA

by: ✓
Peter E. Hildebrand

July, 1993

IICA
F08
H642





Centro Interamericano de
Documentación e
Información Agrícola
3 MAR 1995
IICA — CIDIA

**EVALUATION OF AGRONOMIC AND SOCIAL-ECONOMIC
RESEARCH (OFAR)
MINAG/IICA HILLSIDE AGRICULTURAL SUB-PROJECT
(HASP)
JAMAICA**

by: ✓
Peter E. Hildebrand

July, 1993

00006743

110A

F08

H642

PREFACE

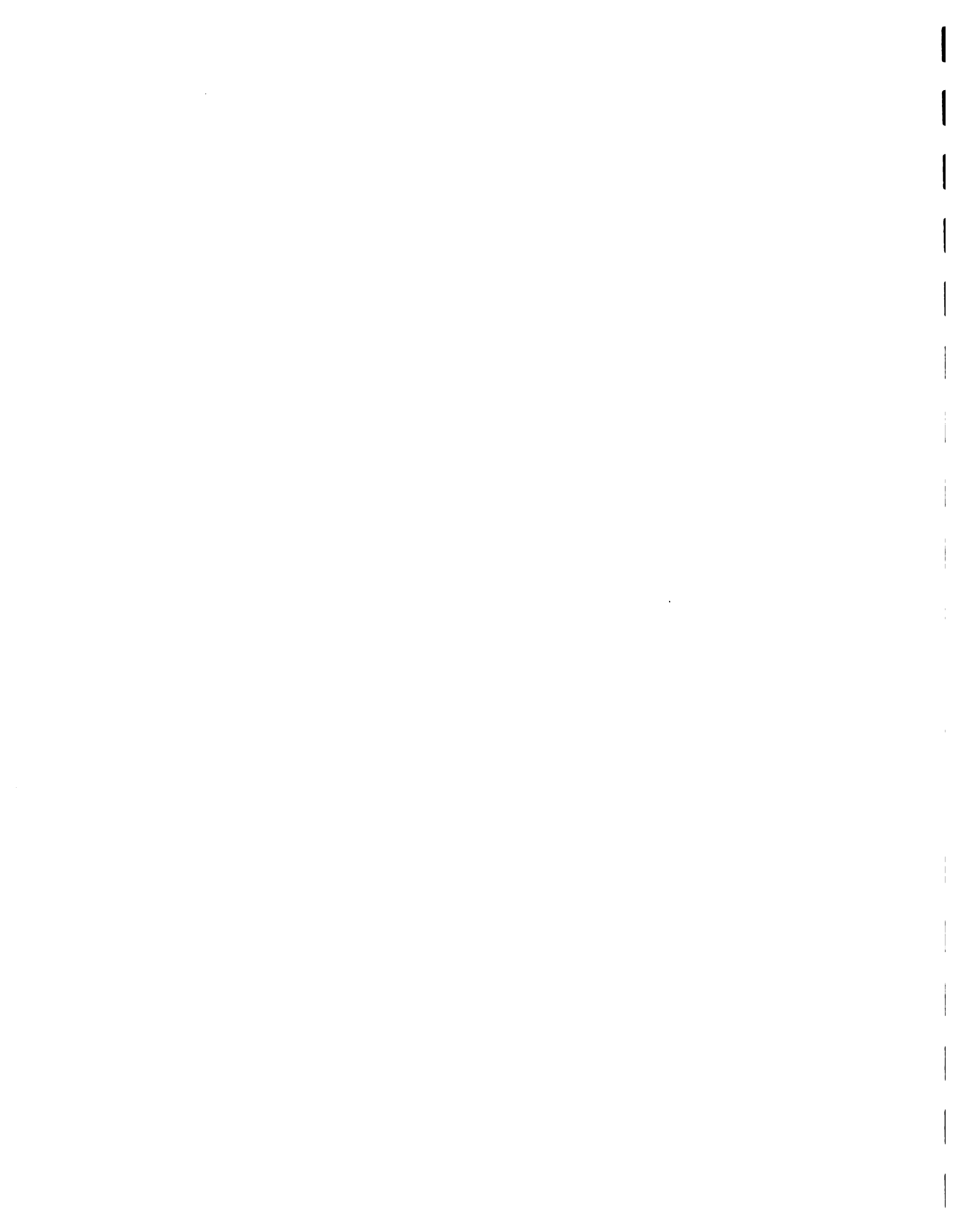
Dr. Peter Hildebrand, Professor of Food and Resource Economics, University of Florida, was contracted to evaluate certain aspects of the Ministry of Agriculture/IICA Hillside Agriculture Sub-Project (HASP). The HASP, which is funded by the USAID Hillside Agriculture Project (HAP), began in 1989 and is in its final year of operation. The overall objective of the HASP is to develop tree-based production systems which can contribute to increased incomes for small farmers while protecting resources in the Rio Cobre watershed, St. Catherine parish.

The HASP approach to hillside agricultural development can be described as an "Integrated Farming Systems Research and Extension (FSR/E)" methodology. HASP fieldwork is carried out by a multi-disciplinary team and involves on-farm adaptive research (OFAR) with ackee, coffee, coconut, mango, cacao, plantain, banana and various vegetable intercrops. Organization and participation of farmers is through Farmer Action Committee Teams (FACTS). In addition to on-farm trials, project activities include a farm store, credit program and a market fair run by FACTS.

Dr. Hildebrand is recognized world-wide as an expert in on-farm adaptive research, and in particular is known for his expertise in the area of farming systems research and extension. He was asked to evaluate the HASP in terms of the agro-economic interventions that have been carried out and specifically to assess the appropriateness of the on-farm research.

OFAR with a farming systems perspective responds to the intricate nature of agricultural development by integrating the components of the farm system(s) in technology generation and transfer. It requires researchers from various disciplines in order to understand farms as dynamic agronomic and socio-economic systems. It also requires that research be carried out on farmers' fields, enlisting their collaboration and addressing the multi-dimensional problems they face. The OFAR approach recognizes that farmers need research only to the extent that it generates technology relevant to their farming systems.

The HASP offers a methodology and experiences that can be applied to the institutional development of an OFAR capability in Jamaica. Dr. Hildebrand's report looks at the efficiency of the HASP in achieving adopted changes. He notes that the HASP is scheduled to terminate at the end of 1993 and that a decision should be made concerning the future of the project given the investment already made. In his opinion, much has been accomplished in the "short time" the HASP has been functioning.



Dr. Hildebrand makes recommendations for the institutionalization of OFAR in the Research and Development Division (RD&D) of MINAG and the Rural Agricultural Development Authority (RADA) that would sustain the achievements of the HASP. He concludes that the HASP is already having an impact on farmers in the project area and describes three scenarios for the continuation of HASP on-farm research.

Repeatedly, development experience has shown that adoption of technologies by small farmers depends on a supportive institutional framework for technology generation and transfer. In Jamaica, this means support for the establishment of an OFAR unit within the national agricultural research system so that there is an institutional capability to generate and transfer technology appropriate to small hillside farmers. The HASP is, as Dr. Hildebrand states, an "excellent base" from which to achieve this goal.

IICA/Jamaica, in collaboration with MINAG/RD&D, is pleased to present this evaluation of the HASP in the hope that it will contribute to a continuing commitment to address the technological needs of small hillside farmers.

L. Van Crowder
Technology Generation
& Transfer Specialist

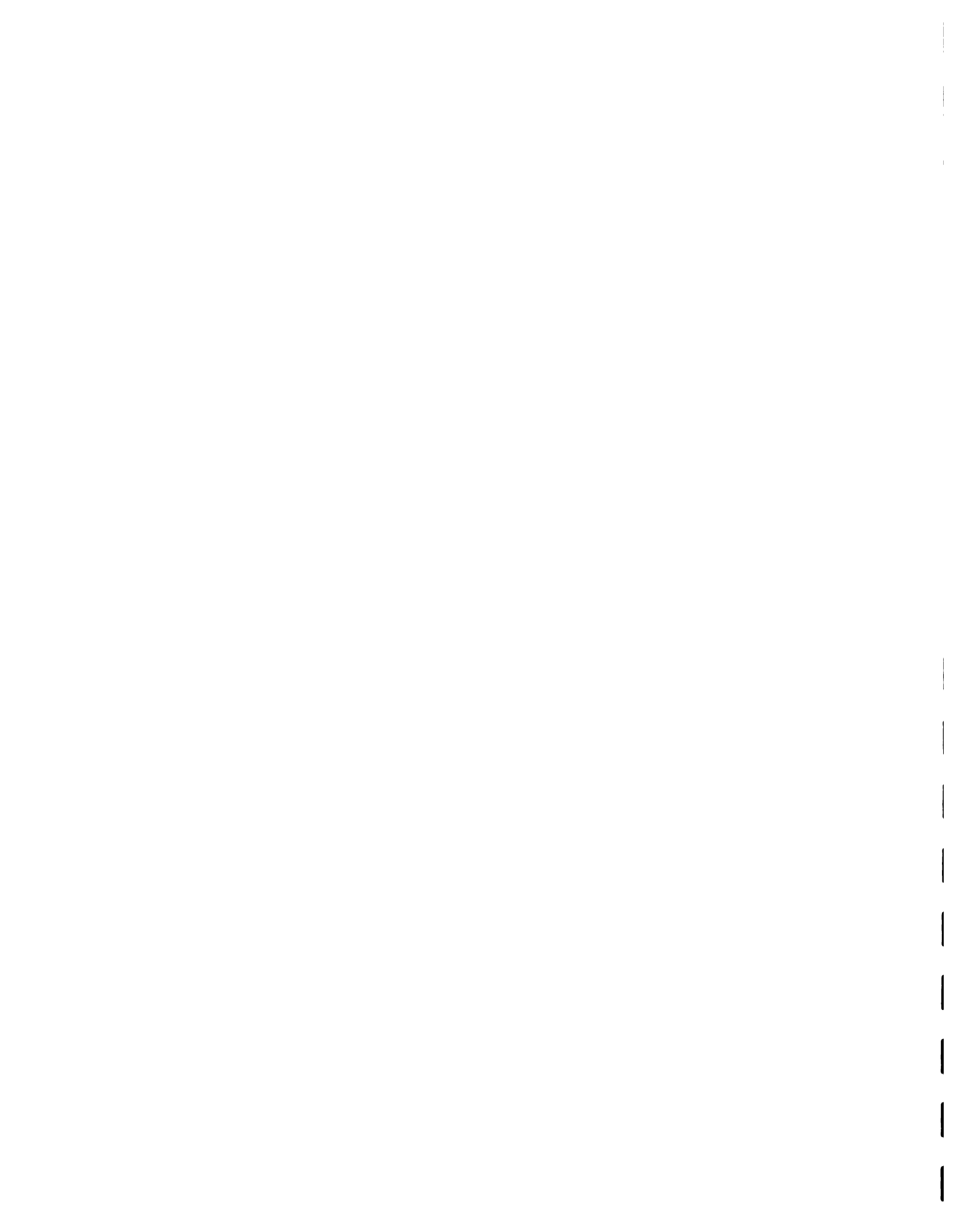
EVALUATION OF AGRONOMIC AND SOCIAL-ECONOMIC RESEARCH (OFAR)
MINAG/IICA HILLSIDE AGRICULTURAL SUB-PROJECT (HASP)
JAMAICA

Peter E. Hildebrand
Professor of Food and Resource Economics
University of Florida

On Tuesday, June 29, 1993, the press of Jamaica carried an article in which the Minister of Agriculture, the Hon. Seymour Mullings, was quoted as saying that for the agricultural sector to experience increased development, the generation and transfer of technology to farmers must be addressed. He further indicated that discussion had revealed that the Ministry should focus on small farmers and on technology development for root crops, legumes and mixed cropping. This approach precisely fits the mandate of the HASP: to promote the growth of tree crops in the mixed cropping systems of small, hillside farmers within the Northern Rio Cobre watershed.

Because small farmers in Jamaica are the main providers of food for the country, it is imperative that these small farmers are seen as a necessary part of the economy. Increased food production is important for the country but directly it is not important for the farmers. Farmers will increase food production, however, in response to a stable market with prices high enough to make them a favorable return to their cash and labor investment. Because it is the small farmers who will produce more food, incentives must respond to their criteria, not the top-down criteria often used by project planners. Government can provide the means by way of infrastructure, policy and technology, but for technology to be acceptable to and used by small farmers, it must respond to these same small farmers' criteria.

When ministry, donor and project officials contemplate sustainability and small hillside farmers they tend to view problems from a top-down perspective. This perspective results in a number of criteria with which to measure project results. Many such criteria were mentioned in the Hillside Agricultural Project (HAP) Sustainability Conference on the same Tuesday as when the press release appeared. Concern with feeding a rapidly increasing population translates into more yield per acre (or kg/ha as used by technicians). Environmental concerns often mean conservation measures such of contour grass barriers planted (reduced soil loss per acre). A felt need to maintain a "way-of-life" for small hillside farmers, many of whom are quite old, translates into subsidies to help maintain a decent level of living (costs per person). Still others feel that small farmers need to increase the scale of their operation to make more money and thus be sustainable (net income per farm).



Small hillside farmers of Jamaica, like many other small farmers around the world, are not as interested as officials in any of these top-down criteria. To them, sustainability means a stable, and if possible increased, net cash flow. Cash and labor are more restricting than land so returns (product) per unit of cash outlay (kg/\$, \$/\$, trees/\$) or per unit of labor expended (kg/day, \$/day, trees/day) are much more appropriate criteria from their perspective than those which are translated from a top-down perspective.

The HASP faces two distinct clientele groups: 1) small-scale, hillside farmers and 2) donor, ministry and HAP project officials. This creates a dilemma in deciding upon which of its clients are the most important for it to serve. This in turn, results in a conflict in choosing appropriate on-farm adaptive research (OFAR) criteria. The nature of the criteria influences the kinds of trials to include in the sub-project, the nature of the treatments to use, and even trial design. It appears that at least some of the facets of OFAR trial design were decided prior to having farmer input, and therefore, farmer criteria.

The most efficient means presently known to generate and transfer technology appropriate to small-scale farmers and that responds to their criteria is through participatory on-farm research-extension or farming systems research-extension (FSRE) activities. Farmers must feel they are stakeholders in OFAR activities and infrastructure development from planning to evaluation to make the process efficient. If projects do not result in adopted changes then the funds and time will have been inefficiently invested.

The Minag/IICA HASP is well on the way to achieving an efficient OFAR program that should result in adopted changes. The Hillside Agriculture Project (HAP) should be commended for recognizing and funding the OFAR of the Minag/HASP project. However, the sub-project is nearing the end of its funding -- scheduled for the end of 1993. A decision must be made concerning what to do with the project and the investment already made. This evaluation was contracted to help with this decision.

The Hillside Agriculture Sub-Project

The HASP was created to increase the socio-economic well-being of Northern Rio Cobre watershed residents while conserving watershed natural resources by developing and promoting hillside cropping systems which include perennial crops.

The sub-project was very ambitious. The number of on-farm trials proposed was unrealistic especially when considering that personnel needed training and experience and in light of the additional duties placed on the research personnel.



FACTS

A great deal of time and effort are required to find appropriate and collaborative farmers who have sufficient land for on-farm trials. The creation and use of the Farmer Action Committee Teams (FACTS) is to be commended even though it required time and effort of the researchers and delayed the establishment of some trials. The FACTS nominated farmers for the trials. The nominated farmers were then screened by HASP personnel for suitability for participation. Although it has not been developed as much as it can be, the FACTS program should be an excellent vehicle for empowering the farmers in the research and extension (technology generation and promotion) process.

Trials

A number of very interesting on-farm agroforestry trials have been established. Some of these are more demonstration than trial, but all will provide some data. Of those observed on this visit, the best is the cocoa rehabilitation factorial trial. One of the treatments in the factorial trial compares directly with the "complete package" in the rehabilitation trial. Another compares with the control in the "complete package" trial except that rat control is used in the factorial. It is suggested that the factorial be analyzed by Modified Stability Analysis (MSA). This set of trials falls a bit short of the optimum number of environments for the number of treatments included (number of environments x number of treatments should approach 48). In this case there are three locations and six blocks, with six treatments or a combination of 36 if blocks are considered as separate environments, which is appropriate with MSA.

The coffee establishment trial is set up as four discrete treatments and on a very limited number of locations. Nevertheless, it should be analyzed by MSA for indications of trends. Additional environments should be included when and if feasible. The data from new environments then can be added to the earlier data from the existing trials to compare trees of the same age.

Both the coconut fertilizer trials and the mango variety trials are well designed, but again suffer from being located in a limited number of environments.

In all trials, all inputs except land and some of the labor were provided by the project. This is an acceptable practice if the response of the treatments in farmers' environments is not known and analysis is to be in the hands of the researchers. However, if farmers are expected to participate in the evaluation, whether their evaluation is contributed to the project or for their own use, it is necessary for the farmers to be responsible for all



non-experimental costs associated with the treatments. In the case of the seedlings, for example, farmers should be responsible for the cost of producing the seedlings as well as for the transport to their farms. Otherwise, they have no way to evaluate the results -- unless seedlings will always be provided free to farmers by project or government subsidies.

It was noted that some farmers were superimposing additional cropping systems on the trials in progress. This is acceptable when using MSA. Two conditions, however, must be met. One, the activity should be done on a whole block of the trial, not on parts of a plot or block. Two, the farmer, the agronomist, or the assistant needs to record what is done and when. This information becomes part of the characterization of the environment which the block represents and part of the analysis by MSA.

For this to work, a method needs to be created by which the farmers clearly can delineate the bounds of each block within a trial. They also need to be made aware that they can superimpose other activities if necessary so long as this activity does not destroy other crops in the trial.

Data management

Generally sufficient data are being taken from the OFAR -- both agronomic and economic. From the data files seen it would appear that data should be entered on spreadsheets as soon as it is collected. Duplicate files must be made so data are not lost. This task cannot be done in the field because there are no computers there. Therefore, an organized, orderly and formal procedure must be created to assure that all data are entered in a timely fashion and with only one transfer from the field data sheets to computer to be as error-free as possible.

Even though data being collected appear to be generally sufficient, there is a great deal of room to improve their quality. First, notations made on the field records must be defined on the field sheets so that the meaning of such abbreviations as X, C, R, etc. are not lost or forgotten. Standard forms should be made up for each trial so that everyone records the data in the same way. Treatments and blocks should appear in numerical order so that there is less confusion both in recording and in copying the data. Data should be recorded for every tree every time. An accountability systems should be created and followed to assure accuracy both in the field and in the office.



Personnel

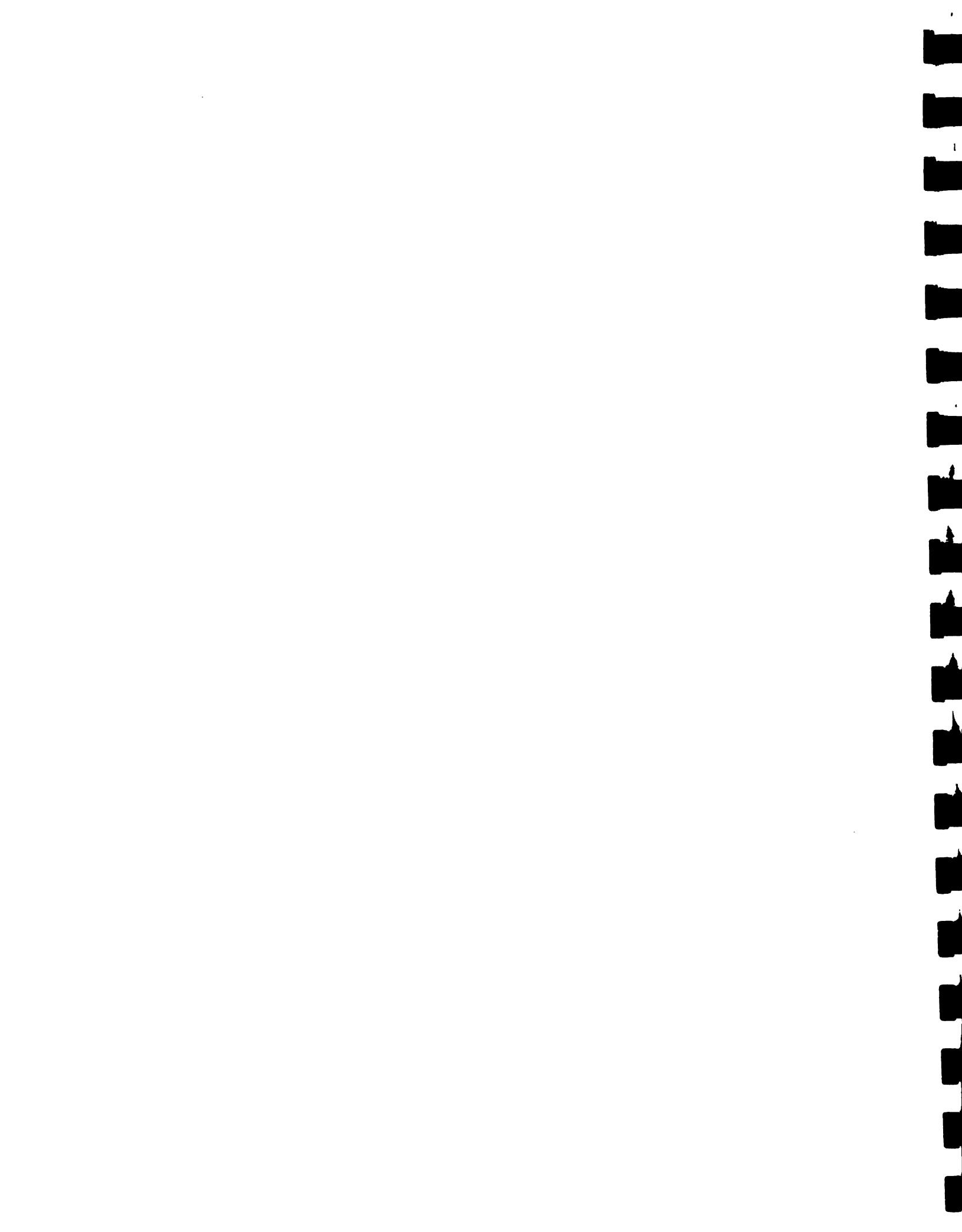
In the field, the project is staffed with a minimum, but acceptable number of people to provide a critical mass. The individuals appear to be highly motivated and knowledgeable about what they are doing and why. The three agronomists and their assistants in the field seem to be doing an excellent job. They know the farmers and their areas of work and seem to be keeping up with the trials they have in place. However, more effort needs to be placed in data gathering. Frequent training exercises would be useful.

Early in the project, there were so many things for the field personnel to do that it was not possible for them to establish all the trials originally intended. Much of the non-research type of activity still takes much of their time -- some of it after normal working hours. As mentioned elsewhere, some of this additional work has been very beneficial to the project because it helped empower farmers as stakeholders in the OFAR.

It would appear that an additional investment in motorcycles for the agronomists' assistants, and training in the safe use of the motorcycles, would be productive. With this increased mobility, it should be possible to plant and maintain some additional locations of those trials already established. An alternative would be for the agronomist to drop off the assistant in one trial while the agronomist visits another.

The Kingston-based personnel are also knowledgeable, enthusiastic and critical to the project. In particular, the arrival of the Technology Generation and Transfer Specialist (TG&TS) knowledgeable in farming systems research and extension methods was seen as especially beneficial by the field people.

It is particularly beneficial for the project that the Technical Coordinator and the TG&TS in Kingston both visit the field frequently. It appears that they are doing so. The economist, however, is not. This needs to be corrected. An economist cannot adequately evaluate enterprise and technology decisions made by small-scale farmers without knowing first hand and in depth about their conditions, needs, desires, resources, constraints, and ultimately, their evaluation criteria. Even though the field personnel are attempting to gather data for the economist, this does not substitute for direct field familiarity by the economist. In addition, it would be useful for the economist to begin collecting enterprise records from a selected group of participating farmers. In particular, this would be useful for the cocoa complete package trial. This information is invaluable for analysis of the trials being conducted. There is some discrepancy regarding the reasons the economist does not get



to the field more often. It would be hoped that this problem can be resolved.

Administration and Management

R&DD, the research arm of the Ministry of Agriculture was to be responsible for the management of project execution in the field, a task that it apparently was not equipped to do because of shortages of appropriately trained personnel and operating funds. Administration of project funds was to be the responsibility of IICA. During the course of the project, IICA moved from being responsible for technical support to R&DD to becoming fully responsible for field management as well as administration.

Conclusions and Recommendations

- HAP should be congratulated for its interest in OFAR. However, the original HASP proposal was unrealistic in its proposed achievements.
 - Too many peripheral development activities were assigned to the on-farm research personnel.
 - R&DD did not have the capability to design and analyze the on-farm research.
 - Too many "trials" were proposed.
- The creation and use of the FACTS, while taking valuable time from on-farm research activities, was an excellent vehicle for empowering the farmers as stakeholders in the research and extension process.
 - The full benefits of the FACTS are yet to be achieved.
 - The members of each FACTS should be helped by the project personnel to put on field days to view "their" on-farm research and to discuss it with other farmers present.
- The cocoa rehabilitation factorial or "desegregated" trial is well designed for Modified Stability Analysis which is a powerful tool for OFAR. However, as noted elsewhere, data collection and recording needs to be improved.
- The coffee fertilizer, coconut fertilizer and mango variety trials are reasonably well designed, but need to have more environments included.

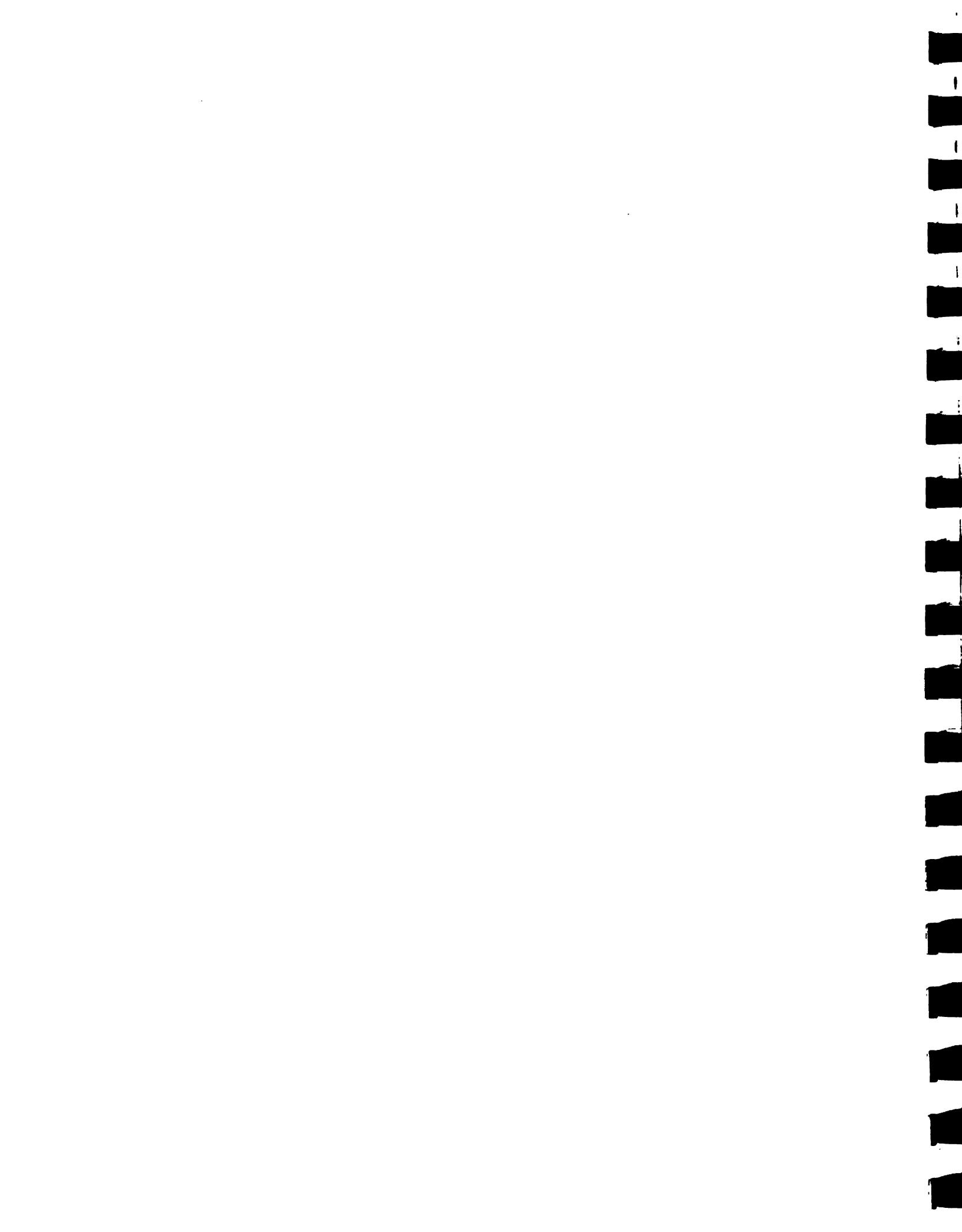


- The number of locations (environments) in the presently existing trials should be increased before additional kinds of trials are added to the project.
- An exception to the preceding recommendation should be the inclusion of some well-designed non-tree trials. It is evident that farmers have a great deal of interest in annual crops with rapid payoff.
- Both R&DD (research) and RADA (extension) are very much interested in the OFAR yet neither has sufficient resources alone to manage it. Some means must be achieved for the two groups to come together to support the activities of the HASP (if not the continuation of the HASP itself).
 - It has been suggested that the HASP field agronomists be named Farming Systems Specialists in RADA and assigned to R&DD to continue the work they are doing in the project area. This is an excellent idea and should be pursued. If Minag were to pick up these agronomists, it is possible that renewed project funding could provide for the assistants and the other operating costs.
 - Transportation is essential for OFAR. The vehicles being used by the agronomists must remain with them if they are transferred to R&DD or other reliable vehicles provided. Farmers do not understand when things are not done because a government official did not arrive on time owing to lack of transportation.
 - RADA field personnel could well take up some of the non-research, development activities presently being conducted by the agronomists and their assistants. This would free the agronomists to expand the number of trials they each are managing. This would markedly improve the quality of the data and the analyses obtainable. However, the agronomists and their assistants would still need to continue their close working relationships with the farmers. One of the benefits would be that the agronomists would have more time to assure that collaborating farmers fully understand the nature of the trials and the treatments being used.
- Formal short course training in on-farm adaptive research and extension methods is essential for all levels of personnel involved in the program. The most appropriate would be one or more short courses held in Jamaica. In this way, donor, ministry and HAP officials could be included in specially selected portions so they would have a basic understanding of the requirements of and potential results



from good OFAR. HASP personnel, and personnel from R&DD and RADA associated with the program would be expected to participate in the full short course program. Ongoing training in research methods and data collection would also be useful for the agronomists.

- Impact of the HASP should not be measured by numbers of farmers involved in the research. The research is meant to be useful to many more farmers than they. As soon as results from existing research become available (yet in 1993), the recommendations being made will then become available through project personnel directly, through the FACTs, and through RADA. In the meantime, farmers in the area are becoming involved in development activities through the FACTs and through the farm store and are benefitting from the project.
- The HASP is an excellent project which is already having an impact on the farmers in the project area. Three potentially recommendable scenarios exist. All three are based on a shift of the agronomist positions to RADA as specialists assigned to R&DD to work full time on the project. RADA field personnel in the area should become directly involved in the field operations.
 - At a minimum, under a reduced funding scenario, most of the current work of the HASP should be continued. The cocoa rehabilitation (both types), coffee establishment, coconut fertilizer and mango variety trials would be included. The FACTs should continue to be encouraged and should pick up more involvement (and ownership) in the trials.
 - At a level funding scenario, additional locations of those trials mentioned above should be established with the aid of the FACTs and RADA. If at all possible, the research assistants should be provided with motorcycles to assure that all data are collected on a timely basis. This increased mobility could also allow the team to establish at least one set of trials with annual crops. At least one short course of at least three weeks duration should be arranged.
 - At an increased funding scenario, the area of the project could be expanded or other project areas could be initiated based on collaboration between R&DD and RADA. Additional field personnel equipped with transportation would be required. A first short course could be arranged for existing personnel who would be trained as well in training for trainers. A second short course could be set up with local trainers from the first course being supported by outside trainers.



- At all costs, the activities of the HASP should not come to an end. Too much has been achieved in the short time it has been functioning. An excellent base has been created for truly bringing research to bear on the problems of small-scale, limited resource hillside farmers to improve their well-being while conserving watershed natural resources by developing and promoting improved hillside cropping systems.



This publication is a product of the "Improving Watershed Management and Increasing Socio-economic Well-being through Farming System Research and Development", a sub-project of the Hillside Agriculture Project funded jointly by the Government of Jamaica, the United States Agency for International Development, and the Inter-American Institute for Cooperation on Agriculture.