# AGRICULTURAL DEVELOPMENT SUPPORT II
# HAITI

University of Arkansas,
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# TECHNICAL ASSISTANCE IN SUPPORT OF THE AGRICULTURAL DEVELOPMENT SUPPORT II (ADS II) PROJECT #521-0092

Report #1A

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# I. BACKGROUND, RATIONALE, AND PROJECT PHILOSOPHY

This section identifies the basic characteristics of Haiti and Haitian agriculture. Based upon those characteristics, the proposed project's rationale and operational philosophy are developed.

Haiti is the only country in the Western Hemisphere which is on the United Nations list of least developed countries. Its infant mortality rate is estimated to be 130, far above the 50 currently accepted as a key indicator of minimum basic well-being. The literacy rate is estimated at 10 to 20 percent. In 1975, the World Bank estimated that two-thirds of its rural population had per capita incomes below $40. Population estimates vary between 5 and 6 million people, and the growth rate is estimated to be about 2 percent per year. The population density is almost 470 persons per square mile. (USAID; U.S. Dept. of State, 1981; Viteritti, 1973: 289-291.)

## HAITIAN SOCIAL ORGANIZATION

Several elements of Haitian social structure are significant for agricultural development. These include Haitian class structure, urban middle class values, and cooperative traditions.

Haitian social system has been characterized by a dual heritage: that of the French colonial on the one hand and of the African slave on the other. This has resulted in the development of a relatively small (5 to 10 percent of the population) elite class and a large lower class with, traditionally, a virtually non-existent middle class (Weil, et al., 1973:39-40). Although the upper class has more recently become open to wealthy, educated nonelites, and a small middle class has developed, the lower class of small farmers has remained largely unchanged since the 1930's (Weil, et al., 1973:39-40). This stratification has special significance for agricultural development based upon modern science and technology. The upper class speaks French while the peasant class speaks only Creole. Members of the lower, small-farm class have

limited access to basic education, and virtually no opportunity to obtain the advanced education required to become agricultural scientists, extension workers, and technicians. Also, as is typical in such class systems, especially in areas close to towns, upper class aversion to manual labor strongly influences the values of the small, growing middle class (Schaedel, 1975:29).

At the same time, although there are class distinctions among peasants--approximately five percent of the rural population are "gros habitants" and thus wield great political power in rural areas, compared to the remainder of rural peasants--Haiti does not have the degree of peasant stratification, exploitation, and powerlessness of landless peasants as many other Third World countries.

Finally, Haitian small farmers have important traditions of cooperative labor and communal activity, characterized, for example, by the "combite." These may have special potential for neighborhood and community development efforts that can benefit from cooperative activity--e.g., watershed management, farming systems research, etc.

## HAITIAN AGRICULTURE

Haiti has a land area of approximately 11,000 square miles, of which FAO classifies close to one-third as arable and permanent cropland (Winrock International, 1981). About 79 percent of the work force is engaged in agriculture, and agriculture contributed about 45 percent of the 1978 Gross National Product of $1.3 billion (U.S. Department of State, 1981) and about 80% of Haiti's export earnings (Centre de Mexican--Salagnac, 1978:1). Coffee and sugar are the primary export crops, with essential oils and sissal playing minor roles. Rice, corn, sorghum, millet, and beans are staple crops and are grown primarily for subsistence (Winrock International, 1981:4).

Haitian agriculture was transformed, during the first half of the nineteenth century, from a pattern of large estates producing primarily

for export to one of small holdings producing primarily for subsistence and domestic markets. It is now characterized by ". . . the existence of a large number of small subsistence plots worked by traditional methods and suffering from soil exhaustion and erosion, frequent droughts, and the isolation of most producers from the market." (Weil, et al., 1973:128).

The income of the Haitian farmer is one of the lowest in the Western hemisphere. Under most Haitian situations, one acre of land will yield an annual average income of US$75 to $100. Depending upon the size of the land holding, small producers may realize no more than US$200 to $300 yearly (Winrock International, p. 6). It is estimated that three-fourths of the farms are under 2.7 acres in size, and, because of slope and erosion, much of this is not arable. Sixty-four percent of the 2.2 million acres classified as being in cropland are on steep mountain slopes, resulting in extensive soil erosion (Weil, et al., 1973:130).

Summary statements of the major problems of Haitian agriculture include very low productivity, severe soil fertility and erosion problems, persistence of what many regard as inefficient, traditional cultural practices and resistance to new technology,[1] perhaps partly because of minimal risk acceptance; and inadequate infrastructure and support systems for agriculture (USAID; Centre de Madian-Salagnac, 1978:3). Indeed, the evidence suggests that Haitian agriculture has been in crisis for some time--a crisis that threatens both the overall Haitian ecosystem and Haitian agriculture's ability to continue to supply the domestic and export demand for food and fiber.

Approximately 70 percent of the farms in Haiti are operated by the owners and their families, although few have clear title to their land. Even those who do may not know the exact boundaries of their

[1] There is evidence, however, that, when examined carefully, modern agricultural technology that has been introduced in Haiti has proven inferior to traditional technology (Centre de Madian-Salagnac, 1977).

plots. Because of increasing population and Haitian inheritance customs, there is a continuing tendency toward both fragmentation and declining size of land holdings, with many farms consisting of several small, non-contiguous plots (Weil, et al., 1973: 130-131).

Despite the small size of farms, most Haitian farms are highly diversified, planting three or more different crops and including at least some livestock, such as goats, chickens, etc. Thus, the farming systems are extremely complex and varied. A preliminary review of cropping patterns and farming systems in the Jacmel-Marigot region, for example, suggests four different farm types, as follows:

1. Farms of less than 1/4 ha with maize and beans, maize and sweet potato, cassava, a household garden, and a few animals.
2. Farms of approximately 1/2 ha with the same production systems above, plus plantain or banana production.
3. Larger farms with from 1 to 3 ha of land that may be even more complex.
4. Smaller, semi-urban farms located near the towns of Jacmel and Marigot that use some of the same cropping systems and incorporate significant off-farm employment (Hart, 1982:17-18).

These patterns vary not only by size of farm and proximity to towns, but also by altitude and region (Centre de Madian-Salagnac, 1978).

A large proportion of farms in Haiti are commercialized in the sense that they participate in local, regional, national, and international markets. Such commercialization has increased as some improvements have been made in transportation, and as urban population growth has resulted in increased demand for food products (Pillot, et al., 1979:5-6). The commercialization of agriculture is achieved through a complex system of local markets and itinerant brokerage enterprises operated largely by women. The system aggregates the very small amounts of produce sold by individual small farm families and delivers it, some-

times through several middlemen, to the urban market (Pillot, et al., 1979).

There is, evidently, strong demand for agricultural products, as evidenced by high food prices in the urban area, and by increased food imports. Although there may be some tendency to distort the prices of export commodities through export taxes, the major food products for local consumption have not suffered from such distortions. Thus, the major problems with the marketing of food products in Haiti have to do with inadequate transportation and inefficiencies associated with the aggregation of very small amounts of produce from thousands of very small producers--large numbers of middlemen, lack of quality control, lack of predictability, etc.--and not from the price policies so common in other Third World countries that discourage production and commercialization.

## PROJECT RATIONALE

The characteristics of Haitian agriculture and society, the goals of USAID and the GOH for this particular proposal, and recent experience in Haitian agricultural development suggest need for an approach which can:

1. Design more productive agricultural techniques responsive to key constraints in Haitian small farm agriculture and developed in cooperation with Haitian farmers to guarantee their superiority and their acceptability.
2. Develop operational and administrative capacity to conduct on-going applied agricultural research responsive to small farmer environments, characteristics, and needs.
3. Develop an agricultural information system that genuinely represents the farming systems extant in Haiti in terms of both the major policy-relevant data items and data collection procedures appropriate for the Haitian small farm environment.
4. Maintain sensitivity to at least two community and regional aspects of agricultural development in Haiti. These are the urgent need to

address the problem of erosion and the need to keep the agricultural marketing system in focus in agricultural development schemes. Other regional issues which are also deemed important are the availability of agricultural inputs, including credit, and availability of transportation facilities.

The integrated strategy outlined in Section III, which has the Farming Systems approach as its central feature, is particularly well suited to accomplish these goals.

PROJECT PHILOSOPHY

As is identified in more detail below, the project adheres to several principles:

1. Integrated approach. Integration of disciplines is central to the farming systems approach. Integration of applied research, training, and information system development is also an important element of the design.
2. Detailed Project Conceptualization. Rather than focusing primarily upon the prior identification of quantitative, measurable objectives, the project emphasizes detailed conceptualization of the process, with opportunity for appropriate documentation, evaluation, and intervention at key points.
3. Detailed Documentation. The project will emphasize detailed documentation of the development process to improve communication among project participants, to facilitate project evaluation and improvement and to assist in building institutional capability.
4. Bottom-Up Process. The project will emphasize developing new agricultural technology, building an agricultural information system, and training agricultural technicians, all based upon farmer participation and extensive use of the detailed information about Haitian farming systems that the project itself acquires in the field.

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## II. PROJECT GOALS, OBJECTIVES, AND OUTPUTS

### PROJECT GOAL

The goal of the project is to assist the Haitian Ministry of Agriculture, Natural Resources, and Rural Development (DARNDR) in strengthening its operational and administrative capacity to conduct and coordinate a national program of farming systems development and agricultural information collection, analysis, and dissemination. The target group is the traditional small farmer and appropriate technology will be designed to increase his productivity and assist him in contributing to environmental preservation.

### PROJECT OBJECTIVES

There are three general program objectives that will contribute to the achievement of this goal:

1. Introduce the farming systems approach and develop the institutional capability to carry out farming systems research resulting in alternative, adaptable, and economically viable production technology beneficial to the small farmer.

2. Develop institutional capability to collect, analyze, and utilize policy-relevant agricultural production, marketing and socioeconomic information about small farmers.

3. Train Haitian agricultural technicians, statisticians, data analysts, enumerators, and farmers to continue to carry out the above objectives after the project terminates.

### PROJECT OUTPUTS

There are a variety of other intermediate objectives, defined as Project Outputs, which must be met in order to achieve the three general

ones outlined above. These include documentation, instruments and procedures, technology, trained personnel, production and marketing information, an information system, institutional capabilities, and an organizational structure.

Documentation

Careful and detailed documentation will be produced throughout the project, including:

1. Characterization of agricultural information systems.
2. Characterization of existing farming systems.
3. Descriptive studies of regional and community systems relevant to small farm development, e.g., regional credit and marketing systems, regional watersheds, and regional soil and climatic characteristics, community credit and marketing systems, farm organizations, and local social organizations.
4. Detailed description of selected farming systems and of crop production systems found on these farms.

Agricultural Information Collection Instruments and Procedures

Procedures for performing research and for collecting agricultural production and marketing information will be developed:

1. Survey instruments for use in the routine collection of agricultural production and marketing information. It is anticipated that different sets will be required for collecting marketing information, data on farm families and farm population, information about farm land use, yields, etc., and finally, information on input costs from suppliers.
2. Detailed procedures for carrying out farming systems research.
3. Sampling frames and sampling procedures for the collection of agricultural production and marketing information.

## Farming Systems Research Instruments and Procedures

Technologies for carrying out farming systems research will be produced. These will include such things as instruments and procedures for:

1. Farming systems characterization, including:
   a. Initial rapid appraisal
   b. Constraints surveys
   c. Farm monitoring
2. Screening alternative technology
3. On-farm testing of technology

## Agricultural Technology

1. Alternative farm technology appropriate for the Haitian small farmer will be designed, tested and evaluated, and, if appropriate, made available for dissemination.
2. The appropriate agricultural technology developed by the project will be adopted by small farmers, with consequent improvements in productivity.

## Trained Agricultural Technicians, Survey Analysts, Enumerators, and Farmers

1. Participating agricultural graduates will be thoroughly trained in farming systems research.
2. Survey analysts will be trained in the design, implementation, analysis, and reporting of agricultural and socioeconomic surveys.
3. A cadre of field enumerators will be trained for taking agricultural and socioeconomic surveys.
4. Farmers will be introduced to scientific problem-solving techniques appropriate to farm production and management.

## Agricultural Production and Marketing Information

Reliable data on agricultural production and marketing practices, prices, etc., will be produced for use in planning and agricultural policy. In part, the farming systems research effort will determine the exact data elements that will be appropriate to characterize the Haitian small farm situation. Extreme selectivity is needed to ensure that the agricultural information system is viable and workable. At present, it is anticipated that the following general kinds of information will be produced:

1. Periodic information about marketing of selected agricultural products, including information about quantities and prices.
2. Periodic information about selected production enterprises, including, in particular, such things as the extent of plantings of selected cash crops, yields, planting intentions, cultural practices used, inventories of livestock, etc.
3. Periodic information about major land uses.
4. Periodic information about selected socio-economic characteristics of farmers and farm families (net income by sources, tenure status, indebtedness and credit sources used, labor availability and use, etc.).

In addition, the project, in close cooperation with all relevant agricultural agencies, will select appropriate mechanisms for the publication and dissemination of agricultural information, e.g., marketing report series, crop report series, livestock report series, and socio-economic report series.

## Institutions and Institutional Capability

Two major institutional outputs will be the establishment, in close cooperation with all relevant agricultural agencies, of an organization capable of carrying out on-going farming systems research and extension and of an organization which can collect, analyze, and disseminate

selected agricultural information on a regular and timely basis.

These institutional capabilities require, in addition to trained personnel, the establishment of an organizational structure and certain physical facilities and equipment. Actual facilities and equipment cannot be completely identified at this time. However, one important output of the project is the acquisition of computer hardware and software to process agriculture information, as well as word processing and printing equipment required to prepare and print regular agriculture information publications, survey instruments, etc.

## III. INTEGRATED STRATEGY

The general project strategy consists of three subprocesses: (a) farming systems research, (b) agricultural information gathering and analyses, and (c) training. In this proposal, these processes are often discussed separately, but it is a basic project premise that the three processes complement each other and must be effectively coordinated as an integrated strategy.

The proposed project strategy is presented below. First, a conceptual framework is outlined. The farming systems, information gathering/analysis process, and training are then discussed separately. Finally, the integrated approach is presented and discussed.

### CONCEPTUAL FRAMEWORK

The key to maintaining an integrated approach will be a conceptual framework that is accepted by all participating staff regardless of discipline or responsibility. The conceptual framework that is discussed below is based on a systems approach. Agricultural phenomena are conceptualized as systems and agricultural information gathering, processing and dissemination is conceptualized as a systems process.

A system is an arrangement of components. However, if one of the components of a system is taken out and analyzed, it soon becomes apparent that the component is also a system with its own components. It is defined as a subsystem of the original system. This relationship between systems and subsystems is referred to in systems jargon as a hierarchical relationship. Agricultural systems can be organized hierarchically to form a conceptual framework for farming systems research. For example, crops are subsystems of cropping systems, that are subsystems of crop production systems that are subsystems of farming systems.

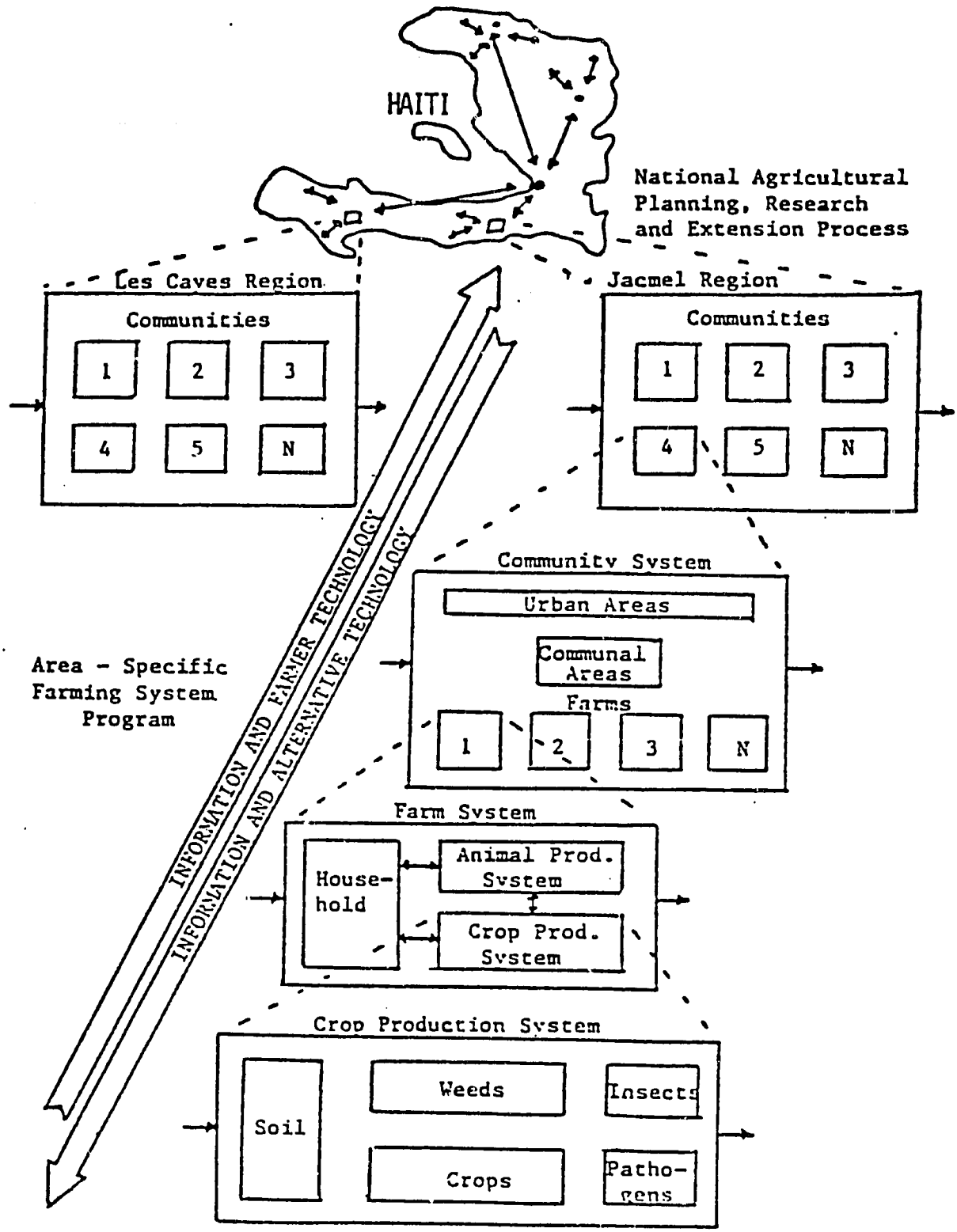



Figure 1. A set of hierarchical agricultural systems that could be used as a conceptual framework for a farming systems and agricultural information project.

Figure 1 is a conceptual framework that can be used to integrate a farming systems team in Haiti. The largest system in the hierarchy is the country, since it is assumed that the agricultural information component of the project will have objectives that operate on the national level. The next level in the hierarchy is the region. The third level (subsystem of the region) is the community, since farmers are organized politically and socially into community councils (Conseil Communautaire). The next level down is the farm system, and under it, the various production systems that make up a farm.

Cropping systems are composed of individual crop populations arranged in space and time (cropping pattern) and technological and management inputs. Together with soil, weeds, insects, and crop pathogens, they form crop production systems. These systems can be modified by changing the cropping pattern (distance between plants, plant density, or date of planting); changing crop varieties or species; changing the management of the soil, weeds, insects, or crop pathogens; or a combination of the above. Because of the interaction among factors (for example, the best bean variety in a monoculture often is not the best variety when intercropped with maize), cropping system and crop production experiments are often complex.

It is worth noting that almost all agricultural research has been done with production system components the bottom level, and almost all development activities have been done at the regional level. The assumption has been that research with production system components would produce technology that a farmer can integrate into his production systems. This will produce more productive farm systems, more productive communities, and regional development. However, this has occurred in very few cases in Haiti. An advantage of the conceptual framework presented in Figure 1 is that it connects the national information and planning process to the on-the-ground farmer activities and regional development processes to the production system component technology. Experience with agricultural information gathering and analysis, done to support the farming system activities, serves as a basis for the design of a national level information gathering and analysis system.

The focal point of the conceptual framework is the farm system, but activities occur at all levels. For the project to be successful, a general strategy is needed that will take advantage of existing component technology, analyze predominant production systems to identify alternatives, analyze farm systems to the degree necessary to evaluate alternative production systems, and identify key community and regional factors (e.g., soil erosion) that both affect the adoption of new technology and may be profoundly affected by it.

## FARMING SYSTEMS

There are farming systems research programs in international centers (IRRI, ICRISAT, IITA, and ILCA are the most advanced), at regional centers (CATIE and CARDI), and as part of national programs (Indonesia and Guatemala have had considerable experience). These institutions all take a slightly different approach. For example, IRRI has concentrated on rice-based production systems, ILCA on animal-based systems. CATIE emphasizes environmental relationships and has tried to locate projects sites in different types of environments. ICTA, in Guatemala, has emphasized on-farm screening of the technology produced on the field station. Some U.S. institutions are developing different approaches as staff with experience in various of the above institutions combine their experiences.

Most of the above institutions include the following general steps in their farming systems strategy:

1. Target area and target farming system selection. Various criteria are used, but political and development objectives are usually given the most emphasis.
2. Characterization. In the past, there has been a strong emphasis on surveys, but in the last five years, many institutions have divided this process into three substeps:

a. Initial rapid appraisal

b. Short survey aimed at specific questions identified during the rapid appraisal

c. Cyclic monitoring of representative farms. Some teams monitor on a weekly basis; others, every 28 days; others, every month.

3. Design of alternatives. This is a very subjective process and is usually done in brainstorming sessions. Some objectivity is introduced if enough is known about regional factors (such as credit and markets) and farming system factors (such as labor availability) so that proposed alternatives can be selected or rejected on the basis of either obvious potential or obvious lack of merit.

4. Evaluation of alternatives. Most farming systems groups emphasize on-farm testing, but some biological evaluation can also be done on field stations or on rented land where the researcher maintains more control.

5. Technology transfer. When on-farm evaluation demonstrates that an alternative has obvious merit, then various means, such as community meetings and visits to farms using the new technology, are used to transfer the technology to more farmers.

When the five basic steps outlined above are applied to the set of hierarchical systems (region-community-farm-production system), the result is a farming systems methodology. The methodology is composed of a series of activities that produce specific outputs that form the inputs to other activities. Activities are carried out at the regional level (market and credit studies), at the community level (coordination with community councils), at the farm level (labor-use studies), and at the production system level (evaluation of erosion control techniques and new crop varieties). The objective of all these activities is to understand the predominant farming systems and their production constraints so that appropriate alternative technology for these systems can be identified to resolve these constraints. The interface among these activities is described in more detail under Integrated Approach in this section.

The participation and continuous involvement of farmers will be a key element of the farming systems research program. Every effort will be made to make this a bottom-up process. Farmers will be asked not only to participate in the identification of the production constraints that should be the primary focus of the research, but also in the identification of the types of technology that they would like to see tested first. Early on-farm trials will give the agricultural scientist first-hand experience with the predominant farming system and lead to a design and evaluation process that allows for the synthesis of existing farmer technology with the best available technology generated by field station research scientists.

One advantage of farming systems research programs is that there is no clear distinction between the generation of technology (research) and its diffusion (extension). In farming systems programs, technology transfer begins almost immediately. When an alternative technology has been identified for the farmers in a target area, the new technology can be transferred directly to these farmers and then, through mass media efforts, transferred to farmers outside the target area.

## INFORMATION GATHERING, PROCESSING, AND DISSEMINATION

Agricultural information gathering, analysis, and dissemination is a complex information process; it becomes even more complicated when it is combined with agricultural planning, research and extension. A detailed plan for the design and implementation of a national agricultural information system that would meet all planning, research, and extension needs is far beyond the scope of this proposal. However, the strategy that is proposed will lead directly to outputs with a direct impact on this process. The problems associated with scale, complexity, institutional resources, and the lack of a clear understanding of the predominant farming systems in the country suggest that the design and implementation of a national information system should be a phased-in evolutionary process, based upon detailed analysis of the Haitian small farm systems.

The phases in the design and implementation of a national agricultural information system must include chronological steps that begin by serving the needs of specific geographic regions, expand later to serve other regions, and finally, to the country. It should also include steps that begin by serving the needs of research, then research and extension, and finally research, extension, and planning.

Information gathering and processing in farming systems projects have usually been region-specific and have usually placed emphasis on first, meeting the information needs of research, and later, of technology transfer. The integrated strategy proposed for this project includes the gathering and analysis of information to serve the needs of agricultural planning, as well as the needs of research and extension.

In the development of the strategy proposed below, we have given special attention to reviewing the experience of an AID-funded information gathering, processing and dissemination project in Central America. The PIADIC (Programa Informacion Agropequario del Istmo Centroamericano) project that was funded by ROCAP had the objective of "creating national-level, integrated information systems that could (1) identify information needs; (2) collect, manage, and analyze information from the agricultural/rural sector in general and the farm population in particular; and (3) deliver reliable and timely information to planners, decision makers and researchers." (Rosales, 1981).

In theory, the PIADIC project was closely tied to a Central American farming systems project implemented by CATIE. Both projects were combined in ROCAP's project paper, and in theory, the two projects were complimentary. In fact, there was very little integration between projects. While the fact that the projects were implemented by two separate institutions certainly contributed to the limited nature of the cooperation between them, another reason was probably that the strategy taken by the PIADIC project was top-down (activities began at the Central American and national level), while the farming systems project was bottom-up (activities began in specific sites with individual farmers).

As reflected in the strategy outlined below, much of the "rural area profiling" approach developed by the PIADIC project can be useful in the development of a national information gathering, processing, and dissemination system, but the top-down approach appears to have been one of the reasons why PIADIC was not as successful as many expected.

The strategy proposed is based on the assumption that the design of a national information gathering, processing and dissemination system will be an output of the project; it will not be designed in Port-Au-Prince and implemented top-down during the course of the project. The national system will evolve based on the experience of the farming systems activities:

Phase I. Initial characterization of the existing national level information system and the community farm and production systems in the two regions selected for the farming systems activities.

Phase II. Design and pretest of an information gathering and processing system for the two regions where the farming systems activities are being implemented.

Phase III. Modification and implementation of an information system for the two pilot regions.

Phase IV. Design of a national agricultural information gathering, processing, and dissemination system.

Postproject. Implementation of a national system, after this project has reached its termination date.

Area profiling is a process of systematically collecting physical, biological and economic information and processing this information for decision-making. Usually, when reference is made to "information for

decision-making," most people think of national public-policy decisions, but, in this project, the area-profile data collection and processing will be done to first serve the decision-making needs of farmers, then those of the community and regional extension and research, and finally those of national policy decision-makers.

The area profile will be the link between the information and farming systems components of this project (see under Integrated Approach in this section) and includes the following steps:

1. Compilation of secondary information. After selecting variables on the basis of a preliminary assessment of needs, existing information from the two pilot regions can be compiled.
2. Gathering of primary information. After identifying variables, information is gathered using appropriate instruments, including rapid appraisal (see Initial Characterization in farming system section), informal interviews, key informants, farm monitoring, surveys, etc. The selection of appropriate sampling procedures (sample frame, list frame, and census segments were used by the PIADIC project) and information-gathering instruments is not a simple task and can only be done after careful analysis.
3. Descriptive summarization. In this stage, the information that has been collected is summarized. In most cases, this is done in table form, but because of the systems approach taken in this project, some of the information will be summarized in "system diagrams" to maintain the relationship between pieces of information. Experience in the farming systems project at CATIE has shown that farm and regional system diagrams can be used effectively for research and extension planning purposes.
4. Analysis. At this stage, the information summarized above is analyzed. At the descriptive stage, the question "what crops do people grow?" can be answered. At the analysis stage, the question "how do people produce the crops?" can be answered, or hypotheses as to "how things work" can be formulated.

5. Information dissemination. This project will interface with farmers, community leaders, regional institutions, and national institutions. Information will be collected from sources along this hierarchy and processed with serving the needs of farmers and community institutions as the first priority. The farming system component of this project will immediately disseminate information (e.g., local marketing information) to participating farmers. Regional institutions will disseminate information to other communities that are in the pilot regions but not directly involved in the farming systems project. National dissemination will be at first through existing systems. The pilot results in two regions should lead to the design of a national information system that includes dissemination mechanisms along with information gathering and processing mechanisms.

## TRAINING

This project is designed to be genuinely developmental--developing both institutional capability and skilled human resources. In contrast to development projects which key on technology transfer and treat training as simply another activity, training is considered crucial to making this project work. There is very limited experience in Haiti with farming system research and with the gathering, processing, and dissemination of accurate and detailed information about farming systems. Many of the basic project activities (characterization, design of on-farm experiments, analysis of cropping systems experiments, survey sampling, data analysis, etc.) are highly technical in nature and must be preceded by training activity. Furthermore, it seems reasonable to anticipate that there will be at least some cultural barriers between the educated classes and the peasant farmers and their families, which will have to be overcome. Consequently, training will involve both important cognitive and affective elements.

Most of the training activities outlined below will be primarily directed at improving the capabilities of project staff. However, other

agricultural scientists and technicians working in the regions where the project functions, or DARNDR staff working in other regions, can participate in many of the training activities. Five types of training activities and a description of their integration into project activities are described below.

## In-Service Training

The extension and research agronomists, economists, statisticians, and other agricultural scientists that implement the project can potentially receive the best training possible: practical experience. However, this is not an automatic process. It is often much easier for an experienced project staff member to personally design an experiment or analyze data than it is for him to take the time to explain to an inexperienced staff member how to do it. Encouraging experienced staff to take this time will be an important aspect of this project.

## Workshops

Short intensive workshops will be integrated into the project. For example, after the initial characterization and surveys have been completed and it is time to design on-farm experiments, a workshop will be organized with project staff, key people from different commodity programs and staff from other projects working in the same region. Workshop participants could be divided into small groups, each of which would review all the information from one specific community. These groups could be given two days to write up possible experiments. This type of workshop would have the triple objectives of: (1) integrating different projects working within the same region and integrating commodity programs with production system research, (2) training all participants in designing an on-farm experiment, and (3) producing specific suggestions for the on-farm trials. A variety of workshops will also be organized to facilitate the development of an agricultural information system. Objectives will include training enumerators, survey analysts, and enumeration supervisors.

## Short Courses

Some types of training require more time and formal teaching and will therefore be done as short courses, rather than as workshops. An example of a short course that can be integrated with project activities would be one on Agricultural Systems. In Costa Rica and Honduras, this type of course has been successfully combined with the initial characterization activity of the research strategy. Three days of lecture on basic concepts can be followed by three days of group activities in the field, in which the farming and production systems of a specific area can be described. The time in the field can be followed by three or four days in the classroom, writing up a report that will help students learn basic agricultural systems concepts and also producing a document that the project staff can use to plan the next phase of the research strategy. Some of the training required by agriculture information personnel can also be provided in short courses. Examples are questionnaire design, sampling, and interviewing techniques.

## University Theses

Resources will be provided so that university students can conduct theses or special problems research within the areas where the project is working. In Honduras, a farming systems project arranged to have students spend six months conducting on-farm experiments to satisfy the requirements for a B.S. (Ing. Agronomo) thesis. During the six months these students were in the area, they participated in workshops and short courses. The best of these students were incorporated into the project when they finished their degrees.

In this project, the on-farm trials, the technology screening, the community studies, farm-monitoring studies, agriculture information marketing surveys, and production surveys will all be ideal areas for student participation.

## Graduate Training

In the long-term, the potential of farming system research and of a farming system information system in Haiti will depend upon having staff with graduate degrees and the in-depth training that is required. An ideal way to accomplish this is to have students master a broad disciplinary area such as soil management, production agronomy, ecology, agricultural economics, agricultural statistics, survey research, etc., and then have the student return to Haiti to complete a thesis in the project region. Most of this graduate training could be acquired at the University of Arkansas, but other institutions may also be considered. Before the student leaves, there should, of course, be an agreement that a project staff member will be on the student's graduate committee.

## Specialized Training Experiences

Total familiarity with the potential of research and extension interaction and, particularly, of an agricultural information system, may not be acquired, either in workshops or normal agricultural training in Haiti, or simply by participating in a graduate program in the United States. Consequently, special training experiences, especially in the areas of agricultural survey design, implementation, and analysis, may be planned by Winrock International and the University of Arkansas, in cooperation with the Statistical Reporting Service of the U.S. Department of Agriculture.

# INTEGRATED APPROACH

Figure 2 is a diagram that describes an integrated strategy combining the farming systems and information components of the project. As mentioned in the preceding section on training, many of the farming systems and information activities can and should be combined with training activities.

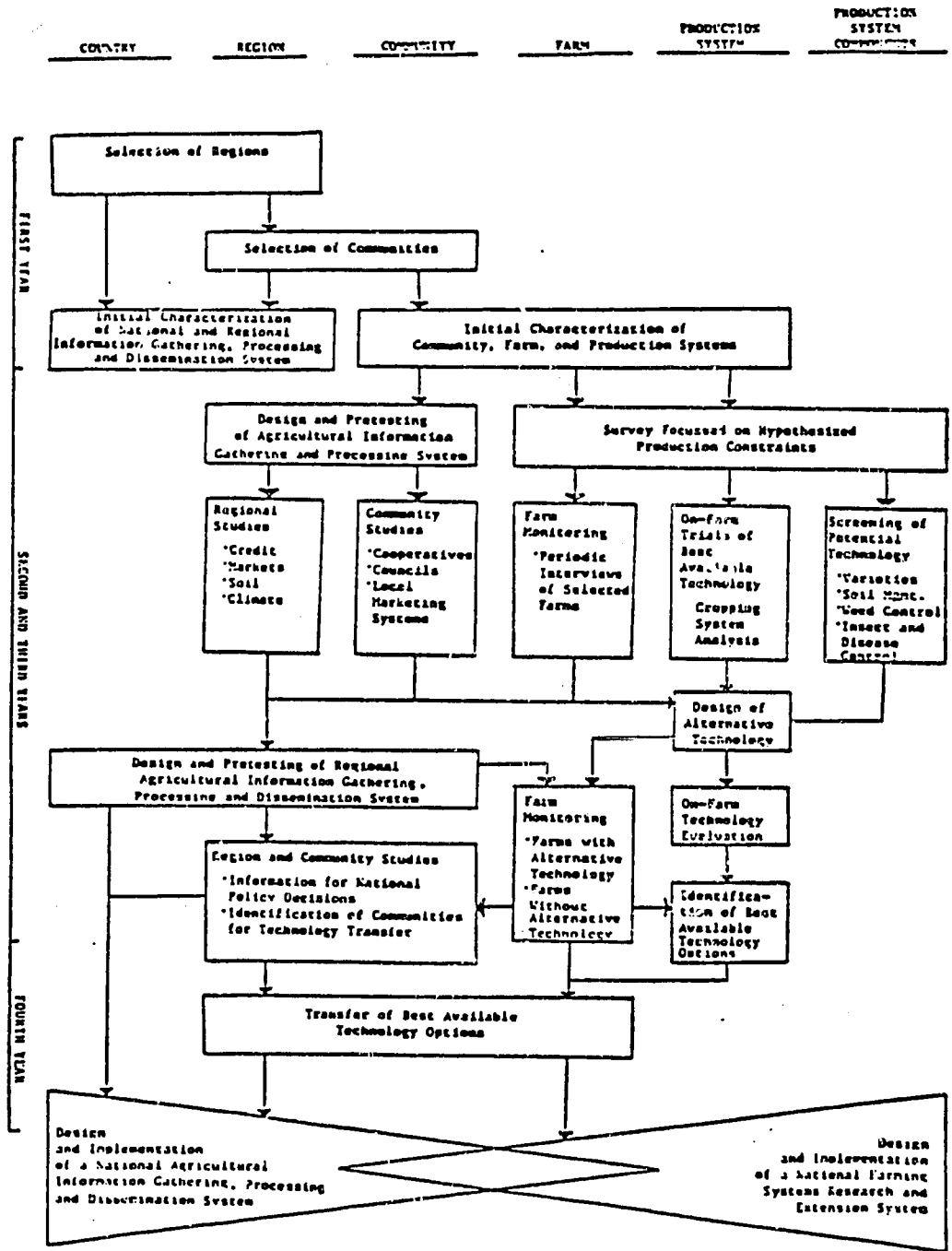



Figure 2. Integrated project strategy showing the relationship among activities directed at different systems along a hierarchy from the country to the production system level, and the general chronological relationship among activities.

The process described in Figure 2 begins with the selection of geographic regions. Since this step has already been taken by DARNDR and USAID, the process described below begins with community selection. The activities are discussed sequentially below, but, as can be noted in the diagram, many activities are, in fact, parallel rather than sequential.

1. Community selection. Once a region has been selected, the next step is to identify communities in the region where project activities should be concentrated. Some of the same criteria that apply to region selection (soil, climate, type of farm systems, representivity, etc.) also apply to community selection. Communities will be representative of region. For example, if the region has a flat alluvial area, an area with steep slopes, and an area on a higher plateau; at least three communities (one from each area) will be selected. A very important consideration will be access.
2. Initial community, farm and production system characterization. Once the communities have been selected, the next step is to obtain a description of the community, its dominant farming systems, and its dominant crop production systems. At this stage, a qualitative understanding is more important than quantitative details. Experience at CATIE (in Costa Rica and Honduras) has shown that initial characterization can be combined with training objectives. People from other regions not in the project can participate. Classroom lectures are followed by days in the field, and reports are produced before the course is over. First, secondary information will be reviewed, then a limited time period will be spent in the field, with time allocated to the community, farm, and production system levels. One useful tool for this activity is the use of system diagrams. These help the team members see things as systems and the diagrams can be used to summarize information. It is important that a document be produced! This document is used by the whole team to design future activities and will contribute to designing the information system.
3. Initial regional information system characterization. This is an important step in the design of a regional information gathering,

processing, and dissemination system, but it also should provide a useful framework for the farming systems activities.

4. Survey. One output from characterization will be a list of specific questions that need to be answered before designing on-farm trials and a list of hypothesized production constraints. These questions will be prioritized, and the team will design a questionnaire (in Creole) that can be filled out while interviewing a farmer in no more than 1/2 hour. While the initial characterization will be done with few statistical considerations, the survey will be done with statistical rigor so that objective analysis can be done. An important output from this survey will be information that can be used to select the sampling techniques and appropriate questions for the design of the regional information system. Survey design and implementation may be combined with a training activity.
5. Design and pretesting of regional information system. The farming systems effort will need regional and community-level information. At this stage appropriate sampling and data collection instruments will be identified and tested.
6. Farm monitoring. The initial characterization and survey give a static picture, but farms are dynamic. Some dynamic factors such as labor availability and cost of production, and social factors, such as farmer objectives, can only be learned through cyclic visits. One method that will be considered in the questionnaire will be to first draw diagrams of the dominant farm systems, and then, within the diagrams, identify the dynamic flows that need to be monitored. The number of farms selected will depend on the diversity of the farm systems in the community and the resources available. The data collected will be used to analyze the dominant farming systems in each community. This will further contribute to the design of the information system.
7. On-farm trials. This is a key activity in any farming systems research program. Ideally, it would be best to start with cropping system analysis experiments to objectively identify the best way to

improve the dominant cropping systems. However, practical considerations usually dictate that the first trials emphasize the testing of technology that team members are subjectively sure will improve the cropping systems. These tests of the best available technology can often be combined with more analytical trials. It is important that farmers participate in the design of the on-farm trials and that they understand they are experiments, not demonstrations. The design phase of farming systems research can easily be combined with a training workshop. Participants can use data collected during characterization (rapid appraisal, surveys, etc.) to design on-farm experiments.

8. Screening of potential technology. This activity is the bridge between traditional discipline-oriented field station research and on-farm research. Even if very little research has been done in the area selected for the project, it is highly probable that it will be possible to identify agricultural technology (such as new crop varieties, weed control techniques, and soil management practices) with enough potential to merit on-farm screening. However, it is also quite probable that the initial characterization and survey will identify production constraints that have not yet been addressed by research. This information will be made available to field station research scientists, who will be requested to assist in rapidly screening the technology currently available to resolve these constraints.

9. Community studies. It is expected that community studies will be an important source of information for both the farming systems technology activities and agricultural information activities. Community decision-making will be a key to active farmer participation. In order to elicit this participation, existing community institutions, such as cooperatives and community action groups, will be invited to actively participate in the project. They will be asked to assist in identifying and solving production, input availability, credit, and marketing constraints.

10. Regional studies. Most of the socioeconomic constraints that affect production at the farm level will be addressed at the community level, but some constraints will need to be analyzed at the regional level. For example, credit availability decisions and the marketing of cash crops are probably controlled at the regional and, possibly, national levels. The regional studies will be very important for the agricultural information component of this project. In order to test an agricultural gathering and processing system, the soils and climate, as well as the credit, markets, and type of farming systems in the region, will need to be classified and documented. These activities will begin in the communities where the farming systems activities are focused and then expand to other communities in the region.
11. Design of alternative technology. This is one of the key activities in the farming systems research process. Design occurs when the results from the regional studies, community studies, farm monitoring, on-farm trials, and technology screening are brought together. It will be imperative that each of these sources be documented so that a design team can synthesize this information and identify alternative technology. Many farming systems projects have combined design activities with training objectives. In this project, design will probably be conducted in a workshop format.
12. On-farm technology evaluation. The alternative technological options produced by design activities will be evaluated by farmers in on-farm trials. While the early on-farm technology screening will be done in experimental plots with farmers participating under the control of technicians, the evaluation of technological options will be controlled by farmers.
13. Farm monitoring. The periodic interviews of representative farmers, initially done as a characterization activity, will be continued, but will evolve into an instrument to evaluate the impact of alternative technology on the farm system and to gather information for the regional information system.

14. Identification of best available technology options. The on-farm technology evaluation and the farm monitoring activities will provide the inputs necessary to identify technology options that merit transfer at the community and regional level.
15. Design and pretesting of regional agricultural information gathering, processing, and dissemination system. The regional, community, and farm studies that were identified as key inputs into the design of alternative technology will also be key inputs into the design of a regional information system. This activity will probably be done in a workshop format, with outside specialists playing a key role in the analysis of pretest studies and in the design of a system that can be implemented immediately at a regional level.
16. Region and community studies. These activities will combine the information gathering, processing, and dissemination ativities with preliminary technology transfer activities. At this point, the farming systems activities that have been directed only at specific communities will take on a more regional character. To gather regional information, it will have been necessary to classify subareas as to soils, climate, type of farming systems, etc. With this information, it should be possible to define a recommendation domain where the technology that was developed for specific communities will have potential applicability.
17. Transfer of best available technology options. The recommendation domains, identified on a regional basis, will determine the design of technology transfer activities to ensure that the technology generated by the farmers and scientists in communities with farming system activities will be transferred to other regional communities where the technology could potentially be adopted.

18. Design and implementation of a national agricultural information gathering, processing, and dissemination system. On the basis of pretesting and testing of a regional information system in two distinctively different regions (Jacmel, Les Cayes), it should be possible to design a national agricultural information system. Because the regional system will have evolved to support on-going farming systems research, the national system will be designed to meet the objectives of the information users, such as farmers, retailers. researchers, extensionists, planners.

19. Design and implementation of a national farming systems research and extension system. On the basis of the activities carried out in the regions and in their different communities, and the degree of success obtained in identifying alternative technology that can be adopted by farmers, it should be possible to design a national agricultural research and extension system that is appropriate to the socioeconomic and ecological situation in Haiti.

## IV. PROJECT ORGANIZATION

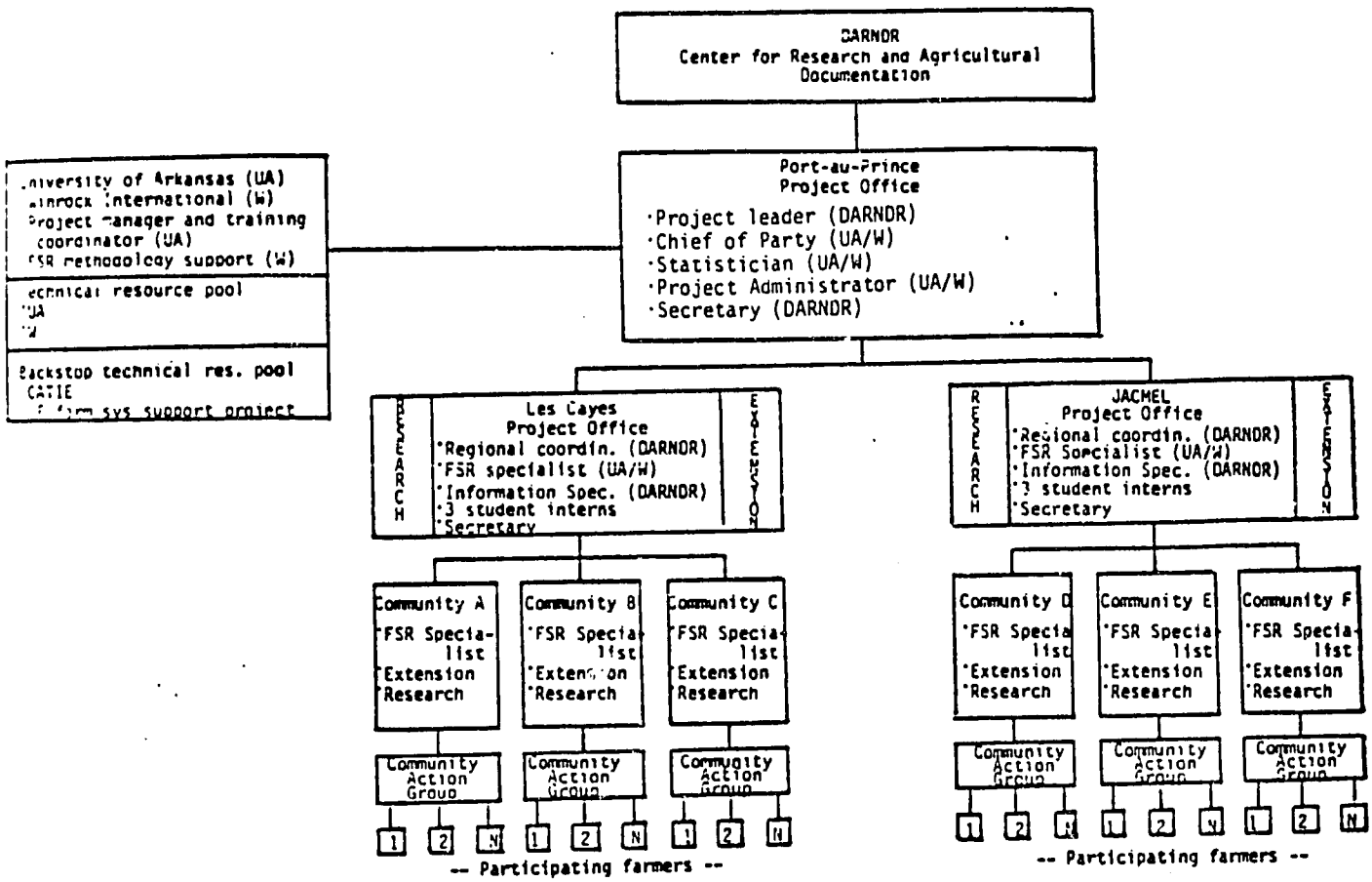
We are committed to implementing this project within the institutional framework of the Ministry of Agriculture, Natural Resources and Rural Development (DARNDR). How to develop institutional linkages among the Center for Research and Agricultural Documentation (CRDA), existing research extension programs and other projects, such as the Soil Conservation Project implemented with the assistance of the Soil Conservation Service, the agricultural research project implemented with the assistance of Texas A&M University, and the Madian-Salagnac project implemented with the assistance of the Institut Francais D'Haiti, are questions that can, and should, only be answered by DARNDR. Clearly, the project organizational structure described in this section is preliminary in nature and represents only a general overview. Before implementation, a more detailed organizational structure would be designed with the input of all participating entities.

Figure 3 summarizes the general organizational relationship that could be set up to implement this project. In developing the organizational framework, it was assumed that the central project office would be in Port-au-Prince (DAMIEN), that there would be a project office in Les Cayes and Jacmel, that the project would work in three communities in each region, and that community action groups or similar local community level groups could be formally linked to the project structure, and that these community groups could ensure direct farmer participation. The different levels of this general institutional structure are described below in more detail.

### Participating Farmers

Farmers are the obvious foundation upon which any farming systems project is built. Beginning with the first day of the initial characterization, farmers will be asked to participate in project decisions. Farmer participation goes far beyond using a small plot in a farmer's

Figure 3. Haiti Farming Systems and Information Sytems Project Organization.



field to conduct an experiment: farmers will participate in the identification of production constraints, the selection of technology to be tested in on-farm trials, and the selection of the criteria used to evaluate the results of these experiments. It may be necessary to assist in the development of participating farm organizations. However, an attempt will be made to utilize existing community action groups.

Community Action Groups

Haitian small farmers have a tradition of cooperative labor and community activities. In many communities these local institutions have participated in development activities such as watershed management. While these groups function effectively in some communities, in others, they do not. Much of the success of this project's farming systems component will depend on the selection of communities where these groups are already functioning well or where effective groups can easily be organized.

Community action groups would be expected to participate in the identification of community-level constraints and in stimulating farmer project participation. Some of the technology screening experiments will probably require plots too large for the participating farms and would be better located on communal land or land rented from larger farmers. This type of activity could be implemented directly by community action groups.

Community FSR Teams

The on-farm trials, farm monitoring and community studies could be directed by community FSR teams. These teams could be composed of three people: a project agronomist, an extension agronomist and a research agronomist. Students from the university that are assigned to regional offices (see below) to conduct B.S.-level theses could be assigned to community teams as well.

## Regional Project Offices

Regional project offices could be set up in Les Cayes and Jacmel. As shown in the organizational diagram (Figure 3), it is important that project activities be linked with extension and research. Staff assigned to each regional office could include a regional coordinator and an information specialist hired by DARNDR, an FSR specialist hired by the University of Arkansas or Winrock (with DARNDR concurrence), three student interns from the University assigned on a six-month basis, and a full-time secretary.

The regional office will coordinate the activities of the community FSR teams and will be directly responsible for regional studies and information gathering, processing and dissemination. To decrease a common tendency to centralize administration to the extent that technical staff spend too much time in a central office rather than in the region, each regional office will be made as administratively autonomous as possible.

## Port-au-Prince Project Office

The central project office will be located with CRDA in Damien. A project leader and a secretary will be hired for this office by DARNDR. A Chief-of-Party and a project administrator will be hired, with DARNDR concurrence, by the University of Arkansas or Winrock International. A statistician will be assigned to the office by DARNDR or hired by UA/WI.

The project leader will be responsible for the overall coordination of the project and would be expected to have expertise in information gathering, processing and dissemination. The Chief-of-Party will be responsible for coordinating technical assistance from the University of Arkansas and Winrock International, and coordinating relationships with USAID in Port-au-Prince. As an economist or agronomist, he would be expected to have expertise in farming system research and, to free him

to spend a maximum of time in Jacmel and Les Cayes, a project administrator would be hired to help with administrative problems. The statistician would be expected to work with the project leader to implement the information component of the project.

University of Arkansas and Winrock International

The University of Arkansas and Winrock International are committed to direct participation in the implementation of this project. In addition to hiring the Chief-of-Party, statistician and two FSR specialists, and providing management and procurement backstop, the University of Arkansas and Winrock International will assign staff to provide continous technical and training assistance.

The University of Arkansas will assign an individual responsible for the management of the project and the coordination of training activities. The training coordinator would assist Haitian graduate students in the design of graduate programs appropriate to the situation in Haiti and make arrangements so that graduate thesis research could be done in Haiti in Jacmel or Les Cayes. The training coordinator would also participate in short courses and workshops in Haiti.

Winrock International will assign an individual responsible for providing FSR methodology support. During the first year of the project, this individual would spend at least three months in Haiti. If there is a delay in identifying a Chief-of-Party with extensive FSR experience and acceptable to DARNDR, the University of Arkansas and Winrock International, an acting Chief-of-Party could reside for up to six months in Port-au-Prince.

The University of Arkansas and Winrock International will jointly plan an internal and external evaluation program. Both institutions are interested in building on their existing expertise in farming system

are committed to a continuous objective monitoring of their so that methodology can be improved.

the University of Arkansas and Winrock International have a technical expertise that will be available to backstop activi- Haiti (see Chapter IX). However, farming systems research and ation gathering, processing and dissemination in socioeconomic and ical situations such as those found in Haiti are very complex pro- . Technical and training assistance will also be requested from institutions with FSR experience, such as the Centro Agronomico pical de Investigacion y Ensenanza (CATIE). Recently, the Bureau of ence and Technology of USAID funded a Farming System Support Project be coordinated by the University of Florida. Both the University of ansas and Winrock International participated in the initial planning ting (December 1982) for this program. Winrock International was sked to lead the first farming system project design activity (an FSR project for CARDI in the eastern Caribbean) done by the FSR support program. This relationship with the University of Florida FSR support program should allow the FSR project in Haiti to request technical assistance (as needed) from any of the U.S. institutions currently involved in farming system research.

# V. IMPLEMENTATION PLAN

Chapter III described an integrated farming system research and information gathering, processing and dissemination strategy. Activities were organized by hierarchical system (region, community, farm, etc.) and by chronological sequence. Chapter IV described the general project organization that will implement this strategy.

This chapter outlines the timing of the proposed activities. Specific attention is paid to identifying critical time periods during which planning, design and project evaluation periods occur. Because of the complex multidisciplinary nature of farming systems research and its emphasis on team activities, this project will place strong emphasis on producing interim outputs. For example, in order to design on-farm experiments, information from regional, community and farm studies, past on-farm trials and field station experiments must all be available for concurrent synthesis by a design team. This information must be documented and must be available at a specific time. These critical time periods are emphasized in the implementation plan.

For purposes of discussion, the plan has been divided into four phases (Figure 4):

## Phase I: Start-up and Characterization

During this phase project staff will be installed, equipment and vehicles will be procured, and preliminary characterization of the regions, communities, and farms where the project will work will be undertaken. The objective of these activities will be to enter the 1984 dry season as organized as possible and with as much understanding of farm-level production constraints and community-level input availability and marketing constraints as possible.

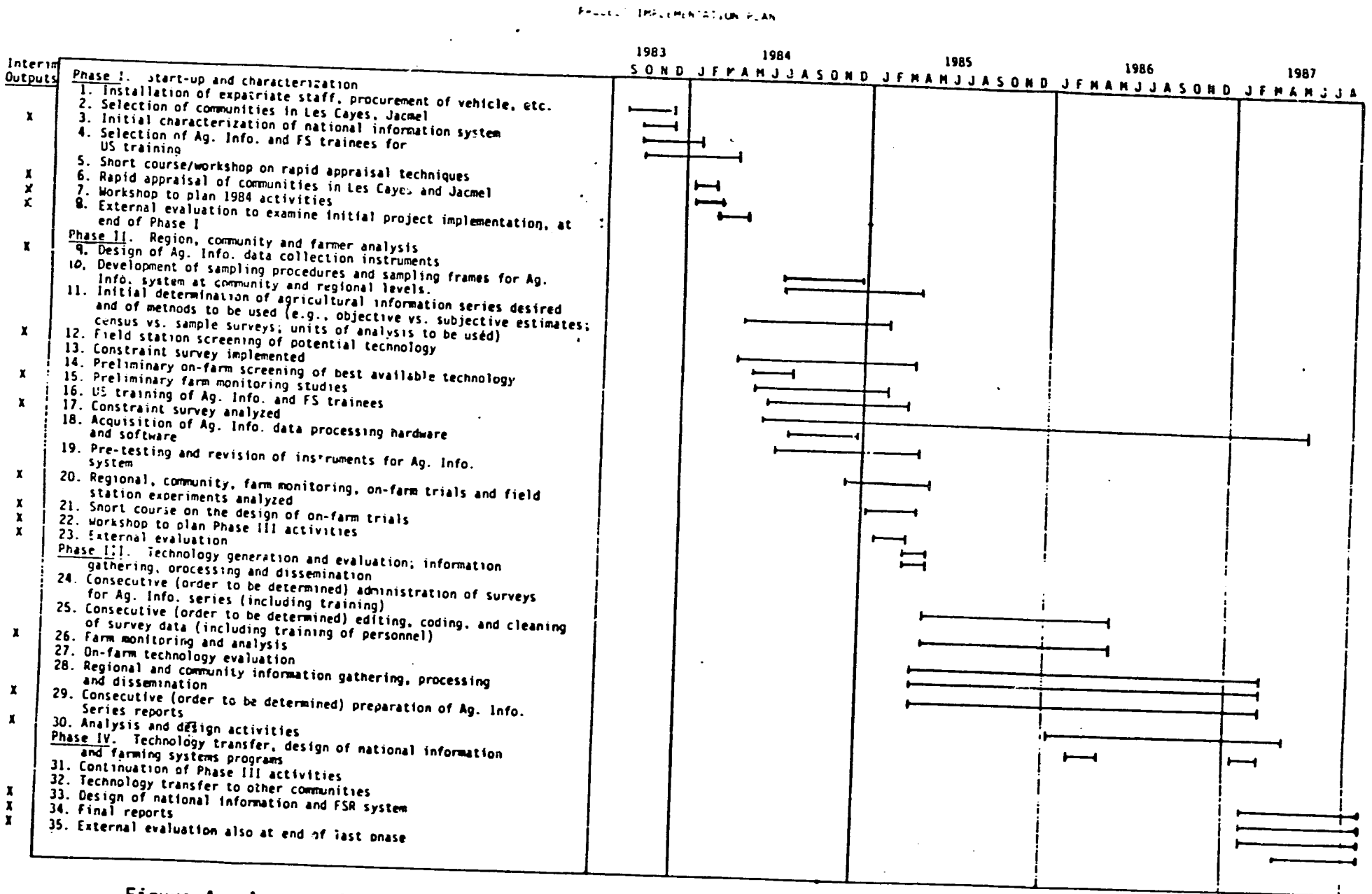



Figure 4. A general project implementation plan showing the timing of key activities and indicating the activities that will produce documented interim outputs.

## Phase II: Region, Community, and Farm Analysis

During the 1984 growing season, technology screening, on-farm trials, constraints survey, farm monitoring and community and regional studies will be undertaken. Their objectives will be to generate information needed to design a viable technology development and evaluation process and an information gathering, processing and dissemination system. It will also be necessary to acquire, by the end of this phase, hardware and software for agricultural information processing and analysis.

## Phase III: Technology Generation and Information Gathering, Processing and Dissemination

In 1985 and 1986, the project should reach a level of stability and begin to produce concrete outputs. Institutional arrangements should be in place, an analysis and planning process should be on-going, staff should reach a level of training such that technology is being systematically identified and evaluated in on-farm trials, and information should be systematically gathered, processed and disseminated to decision-makers in Les Cayes and Jacmel.

## Phase IV: Technology Transfer and Design of National Information and Farming Systems Program

As a result of Phase III activities, technology should be identified that can be disseminated to communities within the Les Cayes and Jacmel regions. Also, as a result of a critical appraisal of Phase III activities, it should be possible to design a national information program and a national farming systems program.

# VI. PROJECT INPUTS

There are basically four types of inputs to be provided by the project. These are personnel, supplies and equipment, funds, and training experiences.

## Personnel

Expatriate personnel will be provided by the University of Arkansas and Winrock International on a long-term basis in Haiti, on a long-term support basis in the U.S., and on a short-term basis as required. Details are presented in Chapter IX, "Staffing for Technical Assistance."

## Equipment

Equipment requirements will include office equipment, staff transportation, vehicles, computer and data processing hardware and software, and equipment for word processing and printing. Specific requirements will be determined, in consultation with DARNDR and AID officials, during project budget development and project operation.

## Supplies and Other Direct Costs

These include expendables, project travel, transportation, shipping, etc. Required funds will be determined during development of the project budget.

## Training Experiences

Since one of the major objectives of the project is to develop institutional capability in DARNDR, the provision of training experiences is essential to success. Training experiences will be provided on

both farming systems research and agricultural information system concepts and procedures. These will be provided both in Haiti and in the United States. Some of the topics to be covered in these training experiences are:

1. Farming systems concepts
2. Techniques for "Rapid Appraisal"
3. On-farm monitoring techniques
4. On-farm technology evaluation techniques
5. Survey design
6. Applied sampling
7. Statistical techniques and data processing
8. Interviewing
9. Computer programming

The following types of in-country training experiences will be provided to Haitian agricultural technicians and scientists:

1. Intensive workshops
2. In-service training
3. Short courses
4. Supervision of university theses

More specialized training will be provided in the United States. These specialized training experiences will provide graduate education for selected Haitians in selected discipline areas such as Agronomy, Agricultural Economics, Statistics, and Survey Analysis. They will also provide special training experiences with U.S. agricultural agencies such as the Statistical Reporting Service. This training will focus upon developing capability in farming systems research and agricultural information system concepts.

It is anticipated that training will be provided to at least the following numbers and types of persons:

| | |
|---|---|
| 4 | Farming Systems Research Specialists (U.S. training) |
| 12 | Agricultural Extension Agents trained in FSR concepts |
| 2 | Agricultural Statistician/Information Administrators (U.S. training) |
| 2 | Computer Operators (U.S. training) |
| 4 | Survey Analyst/Supervisors |
| 12 | Enumeration Supervisors |
| 48 | Enumerators |
| 12 | Agricultural Student Interns |