

POSSIBLE FUTURE DIRECTIONS FOR AID ACTIVITY
IN FARMING SYSTEMS RESEARCH:
A CONCEPT PAPER

PREPARED FOR:

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March 1988

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A. Introduction

During the past five years, since September 1982, the Office of Agriculture within AID's Bureau for Science and Technology has supported farming systems development in developing countries by means of technical assistance, training, and networking provided through the Farming Systems Support Project (FSSP). AID terminated support of FSSP on December 31, 1987, for reasons outlined in the End-of-Project Evaluation and other documents. However, the potential importance of farming systems work for agricultural development in general, and for the small-farm sector in particular, continues to be recognized.

The purpose of this document is to initiate and stimulate discussion regarding the future direction and focus of efforts by AID and other donors to support work in farming systems research and development. It contains a brief analysis of the historical reasons why the farming systems approach came about, an examination of possible areas where future work in farming systems could concentrate, a discussion of possible options that AID could use to channel future support, and recommendations regarding priority activities for the immediate future and the medium term.

B. The Evolution of the Farming Systems Approach: An Historical Sketch

The farming systems approach to agricultural development came into existence in response to the inability or unwillingness of certain types of farmers--particularly small, limited-resource farmers--to adopt new agricultural technology emanating from the universities, the international agricultural research centers, and the private sector.

For many years, development specialists believed that farmers did not adopt technology because they were perceived as being backward, and uneducated, possessing a traditional mentality that rejected change. This concept gradually changed as professionals undertaking field research in developing countries began to communicate directly with small farmers, discovering that resistance to technology adoption was due not to mentality, but rather to the myriad of constraints and disincentives facing farmers. Principal factors limiting adoption were lack of access to capital inputs, product and factor price levels that negated profitability of new technology, lack of or difficult access to markets, or enterprise patterns that responded to the needs of farmers for food, off-farm

employment or their livestock, but did not facilitate the use of technology designed to be applied to a monocrop situation. As further evidence, Theodore Schultz, in his landmark book Transforming Traditional Agriculture, found small farmers to be relatively efficient producers from an economic standpoint in allocating their scarce available resources to alternative productive activities off the farm as well as on.

Why was there a lack of "appropriate technology"? One reason was the evolution of the structure of agriculture in the developed world, especially in the United States. Until the 1940s, the U.S. agricultural production sector was characterized by small family farms, which were served by a land grant research and extension system composed of professionals from farm backgrounds in tune with the needs and circumstances of their clientele, the farmers.

Over time, the structure of U.S. agriculture evolved, spurred on at least in part by the invention of labor-saving technology enabling a single farmer to productively farm larger and larger areas of land. Unfavorable cost-price relationships meant that farm size had to increase in order to generate adequate incomes. "Get big or get out" was and continues to be the theme of the day. The rapid pace of industrialization and the development of the service sector provided the mechanism for absorbing much of the displaced farm labor. Farms got bigger and controlled more resources.

As part of this process, the land grant system also evolved to better serve the needs of a new clientele--larger farm businesses with substantial resource bases. In order to address the more precise technological needs of the new structure, universities became more specialized, divided into disciplines and subdisciplines, to a great extent losing their multidisciplinary perspective and interest in the farm-household. Farm management, the area where the various disciplines were integrated into a whole farm perspective, assumed reduced attention and importance. Teaching of the subject was limited mainly to a few courses contained in the curriculum of agricultural economics departments.

Another contributing factor was the general direction of technological change, with a definite bias toward innovations resulting in marketable, patentable products rather than more general techniques and cultural practices whose benefits are not necessarily capturable by the innovator. Although the literature is filled with information about the functioning and contributions of the land grant system, it appears that the private sector has had a greater role than realized in shaping the patterns of technological change in world agriculture through the development and export of technology embedded in inputs and machinery.

The methodology of agricultural research was transferred to the developing countries through the education and training of LDC professionals in U.S. universities who later returned to positions of leadership in their own countries, and via programs through which U.S. universities helped organize and develop faculties of LDC universities. Thus, the same bias toward larger farmers with greater access to resources was transferred to the LDC research establishment.

Perhaps more important than education regarding research organization and methodology was the transfer to LDCs of the technology itself, for the most part contained in hybrid seeds, chemical inputs, and machinery and implements. It facilitated concentration of agricultural production on larger units while at the same time lowering overall labor requirements. In contrast to the U.S. situation, displaced labor could not be absorbed by the usually underdeveloped industrial sector. Significant portions of the population settled on hillsides and marginal lands less well suited for agriculture.

Small farmers in LDCs comprise a large percentage of the rural population and their production impacts considerably on national food supplies, especially with respect to staple food crops such as rice, corn, and beans. Thus, a definite demand, more latent than expressed, existed for the development of the farming systems approach.

The farming systems approach was developed and refined over time through trial-and-error field experience of an initially small group of researchers who developed a better understanding of the constraints faced by small farmers in the developing countries of Asia, Africa, and Latin America. Among the better known developers and proponents of the approach were Collinson and Norman in Africa; Hildebrand and Hart in Latin America; and Bradfield, Harwood, and Zandstra in Asia. These original implementors came from diverse disciplinary backgrounds, mainly agronomy and agricultural economics, and were able to recognize the contribution to problem-solving that various disciplines could make. Apparently, there was minimal communication among the researchers from different continents and--with the exception of Asia--within continents in the early stages, so several researchers developed similar conclusions and strategies independently during roughly the same time period.

Problems related to the approach began when, in a pattern similar to other short-lived approaches to agricultural development (e.g., integrated rural development, public institution building, agricultural sector modeling, and, most recently, non-traditional agricultural exports), it became a fad among the international donor community. The notion and concepts

surrounding farming systems research, or FSR as it was more commonly known, were accepted and adopted by members of the broader academic and research community who had not really participated in its development. They did, however, help "sell" the idea to the donor community, and soon farming systems came to be viewed by many as a panacea rather than simply an alternative approach to development and transfer of technology adapted to the needs of small farmers. AID commissioned a survey on farming systems research and development work worldwide which, when published, helped promote the concept.^{1/}

A major problem early on was the lack of a uniform definition of what farming systems was and was not. Confusing terminology proliferated, and many people assigned their own definitions, thereby adding to the confusion. The lack of clear definition and uniformity of terms meant that some projects and programs were doing farming systems type work without acknowledging the label, while others were doing something else and calling it farming systems. The term proliferated in the development of new AID projects, mainly because project developers believed that using that label would assure rapid project approval. During the early 1980s, the number of AID-financed farming systems projects or projects with farming systems components being implemented worldwide increased significantly to the point where the majority of countries in which AID works now have or have had farming systems projects. A survey conducted by FSSP in 1985 indicated that there were some 250 long-term projects worldwide carrying out farming systems work. Since 1978, AID has funded 76 bilateral, regional, and centrally-funded projects containing either a farming systems orientation or clearly focused on farming systems work--45 in Africa, 19 in Asia/Near East, 10 in Latin America and the Caribbean and FSSP with (arguably) a worldwide focus. Furthermore, new projects with farming systems components are continuing to be developed and implemented.

While the number of farming systems projects increased rapidly during the early 1980s, the supply of qualified technical assistance providers could not keep up with the demand. There were few well-trained professionals with real field experience who were capable and available to provide the quantity and quality of technical assistance necessary to establish and facilitate the integration of farming systems research methodology into LDC research and extension systems. Given the short supply of experienced practitioners, the quality of technical assistance provided to projects has been variable at best. Poor project implementation performance on a number of

^{1/} Shaner, W.W., et. al., Farming Systems Research and Development: Guidelines for Developing Countries, Consortium for International Development, Westview Press, September 1981.

projects has contributed to a downgrading of the approach in the eyes of many development professionals and AID project managers.

Given the nature of events that had occurred, it became clear why donor support for farming systems work has fallen off. Initially, high expectations were stimulated because farming systems appeared to be something new, it involved potential changes which would benefit everybody or at least hurt nobody, and it focused on directly helping the poorer segments of the rural population. At the same time, there was a general misconception regarding the level of development of the state of the art in farming systems implementation, as well as a misunderstanding regarding the length of time required to institutionalize the approach and begin to develop technologies appropriate for adoption by limited resource farmers. Nevertheless, a vocal minority of university faculty members and the small group of professionals with actual field experience eagerly jumped on the bandwagon. Many of the senior university faculty viewed farming systems as a reinvention of an old wheel (farm management), resented the notoriety that farming systems was getting, and for the most part did not participate in the projects and networks. Looking back, this was unfortunate, as input from those with a broader historical perspective perhaps could have benefitted the emerging farming systems methodologies.

C. The Essence of the Farming Systems Approach

The essence of the farming systems approach is not in the various methodologies and points of view that have arisen. Rather, it is in the basic client orientation that is inherent in the philosophy of the approach, if not always evident in how it is practiced. A multidisciplinary group of researchers first examines a system, its particular set of surrounding socioeconomic and physical-biological circumstances, then develops a diagnosis as to where problems lie and offers potential solutions to problems that exist. Based on the diagnosis, a research strategy is designed to help alleviate key constraints, usually focused on a combination of crop and/or animal enterprises. Experiments are designed and carried out on a number of representative farmers' fields, with the efforts hopefully resulting in the development of new practices that may be easily adopted by local farmers facing similar circumstances. The literature is cluttered with a myriad of terms which, for the most part, represent minor variations around this central basic theme.

A primary contribution of farming systems research is that it fills a gap in the more traditional agricultural research process by providing closer linkages between researchers and farmers. It allows an adjustment of the process from "top down/researcher driven/supply push" ways typical of the colonial heritage of many developing countries, toward "system

based/farmer-driven/demand pull" methods. Furthermore, with a greater portion of work taking place in rural communities and farmers' fields, there are major opportunities for linkages between research and extension functions, thereby providing continuity between the technology development and diffusion processes.

Because the diagnosis phase identifies technical and resource problems facing farm families and communities, the approach is potentially a powerful tool in two other roles: the setting of priorities for applied and basic research; and the identification of policy issues and requirements for facilitating the adoption of emerging technology. These interfaces between farm technology and agricultural sector policy are increasingly vital to raising rural productivity and incomes.

It should be clear by now that farming systems research is not a panacea or solution to all problems. It does, however, have its place within the technology development and transfer continuum between basic commodity research and transfer of proven technology to farmers. It consists not only of activities but also of channels of information between the developers of technology and those who use it. Undertaken correctly, farming systems workers provide the linkage that is often missing between research and extension by combining elements of both in an interactive and iterative mode.

D. The Future of The Farming Systems Approach

At this time, it is inappropriate to pass judgement on the overall effectiveness of farming systems work worldwide, since many of the projects are ongoing and, indeed, some are just beginning. What does seem clear is the realization that significant progress in technology development and transfer requires a longer time frame than is usually conceded in a project-type framework. Thus, farming systems projects tend to be downgraded because tangible results in terms of increased productivity and incomes may not be evident two or even four years into the life of a project. What farming systems does offer is a process that is philosophically and logically appealing, but with no guarantee of the end result--which often depends largely upon factors beyond the control of farming systems practitioners.

Despite the problems with performance and unrealized expectations, there still exists a substantial group of people who believe in the basic validity of the farming systems approach, consisting of a number of (mainly social scientists) faculty members of U.S. universities, scientists employed at the IARCs who have incorporated aspects of the approach into their training programs and standard operating procedures, and professionals in developing countries working in national

research and extension programs. Moreover, there are still a number of ongoing projects and programs with farming systems components, and significant progress has been made in training, networking and methodology development by FSSP, IDRC, CIMMYT, IRRI and others. A few of the methods commonly associated with farming systems, especially the rapid rural appraisal or "sondeo," have been and are being adopted by other types of development efforts, such as the analysis of agricultural markets. In a sense, they have taken on a life of their own but are properly attributable to work in farming systems. It is clear that, whether or not farming systems survives as a methodology per se, its influence on agricultural development will be felt for a long time to come.

Several questions arise regarding the future of farming systems and the appropriate role of the approach in agricultural development. Should support of farming systems work be withdrawn? Are the networks and programs established strong enough to stand on their own? If further assistance is required, what should the nature of this assistance be? What are the plans of donors other than AID? Given current budget and manpower constraints, what is the capacity of AID to provide financial and technical support for farming systems? Should there be a "bridge" with the existing project while a new strategy comes on line?

The balance of this paper will address some of those questions, presenting analyses, viewpoints, alternatives, and recommendations as to AID's future participation and focus in support of farming systems work.

E. A Conceptual Framework for the Future Development of Farming Systems Methodologies

In November 1987, as part of the process of review of S&T/AGR activities in support of farming systems work, an advisory panel of agricultural development professionals was selected and convened at the offices of Chemonics International in Washington, D.C. The meetings lasted two days, and consisted of a review of the draft Final Evaluation of the Farming Systems Support Project (FSSP) and brainstorming as to the future activities in farming systems which S&T/AGR could consider funding in a follow-on to FSSP. Participating in the discussions as panelists were:

Albert "Scaff" Brown - agricultural development expert, Chemonics team leader, and former chief of the Rural Development Office of AID's Latin America Bureau;

James Chapman - agricultural economist, Chemonics team member, and farming systems practitioner with experience in Latin America and Asia;

Michael Collinson - agricultural economist, science advisor for the Consultative Group on International Agricultural Research (CGIAR), and farming systems expert with 20 years of experience in Africa;

Hubert Zandstra - agronomist, director for agriculture, food and nutrition of the International Development Research Centre (IDRC), and a farming systems expert with broad experience in Asia and Latin America;

Lane Holdcroft - agricultural economist, independent consultant, and former head of the Technical Resources Office of the Africa Bureau;

Michael Yates - rural sociologist, AID/S&T/RD, formerly a farming systems practitioner for CIMMYT in Haiti;

Calvin Martin - agricultural research specialist, technical advisor to the Technical Resources Office of AID's Africa Bureau; and

Roberto Castro - agricultural economist with S&T/AGR and project officer of FSSP.

The results of the panel discussions were put into a matrix format and presented to several practitioners and support entity representatives at the Farming Systems Symposium held at the University of Arkansas in October 1987. They were also presented to the members of the Technical Subcommittee for Agricultural Research and Extension of the AID Agricultural Sector Council.

Exhibit 1 schematically presents a framework for looking at processes and activities which either reinforce current farming systems work or look toward the future as to where increased attention should be focused as part of farming systems-type efforts.

1. Processes

The left-hand column of the matrix details the sequence to steps usually implemented in the development of an activity from recognition of need and identification of the problems that need to be addressed through to the institutionalization of the activity in national agricultural research and extension systems. The process is sequential, but not rigidly so. Not all the steps necessarily need to be included, the order may change according to circumstances, and successive iterations of previous steps may need to occur before problems are effectively solved or dealt with. A brief explanation follows of each of the steps.

EXHIBIT 1.

A FRAMEWORK FOR POSSIBLE FUTURE ACTIVITIES TO IMPROVE FARMING METHODOLOGY

ACTIONS TO IMPROVE EFFECTIVENESS OF AG RESEARCH AND EXTENSION SYSTEMS

	TRADITIONAL FS	IMPROVEMENT OF FS METHODS					INSTITUTIONAL ISSUES		POLICY LINKAGE
<u>SEQUENCE OF STEPS FROM CONCEPTUALIZATION TO INSTITUTIONALIZATION</u>	<u>ON-FARM RESEARCH/ EXTENSION</u>	<u>FARMER PARTICIPATION IN RESEARCH</u>	<u>CROP- LIVESTOCK INTERACTIONS</u>	<u>GENDER ISSUES</u>	<u>TECHNOLOGY TRANSFER</u>	<u>ECONOMIC AND RESOURCE SUSTAINABILITY</u>	<u>ORGANIZATION & MANAGEMENT</u>	<u>RESEARCH- EXTENSION LINKAGES</u>	<u>FARM-BASED POLICY RESEARCH</u>
PROBLEM IDENTIFICATION									
PROJECTS/PROGRAMS									
NETWORKING									
SYNTHESIS OF EXPERIENCE									
METHODOLOGY DEVELOPMENT									
TRAINING AND MAINTENANCE									
INSTITUTIONALIZATION									

a. Sequence of Steps

(1) Problem Identification

A need to address a specific problem area through the development and implementation of one or more specific activities is identified.

(2) Project/Program Development

Based on the identification of a problem area, a specific project or program is designed to correct the problem or advance the state of the art.

(3) Networking

Contacts are made among practitioners in different areas of a country or region to trade information regarding experiences in addressing or solving the particular problem. This may involve written or verbal communication, usually through newsletters, technical papers, and seminars.

(4) Synthesis of Experience

After a period of time has transpired, an analysis is carried out of the experiences of several groups or projects in dealing with the problems. Lessons learned are synthesized.

(5) Methodology Development

Based on experience over time, a methodology or set of recommended procedures is developed to deal with the problem. The methodology may be written up in a handbook or incorporated into sets of training materials.

(6) Training and Maintenance

Once the methodology for addressing a problem is well developed, it is ready for transfer to those individuals or groups who can benefit from it in order to more effectively carry out their work. As new experience is gained and the ability to deal with problems improved, the training materials and strategies need to be revised to incorporate the new knowledge.

(7) Institutionalization

The resolution of certain problems may lie within the mandate of public or private institutions. The issue needs to be addressed regarding how best to incorporate new modes

of behavior so that identified problems are adequately addressed on a routine basis.

b. Traditional Farming Systems Research as an Example

As an example of the process, consider the development of what is commonly thought of as traditional farming systems research, the process of undertaking research on farmers' fields and extending the results.

The problem was the low productivity of small, limited resource farms and the non-adoption of available new technology developed on the research stations.

The recognition of this problem and the desire to solve it led to the creation of projects and programs such as the Cropping Systems Program at IRRI, the Puebla Project in Mexico, the Caqueza Project, the CATIE Farming Systems Project, and others.

Some projects and programs established communications networks in order to provide mutual technical assistance and share experiences. Notable in this area was the establishment of the Asian Cropping Systems Network by IRRI's Cropping Systems Program in the mid-1970s. More recently, the FSSP made significant efforts at networking, utilizing newsletters, symposia, and providing support to WAFSRN in West Africa.

As an outgrowth of individual and collective experience in Asia, Africa, and Latin America, an AID-commissioned study (ibid.) was published in 1981 which synthesized the experiences with farming systems work up to that time.

The methodologies of farming systems work were further developed and refined by the IARCs with farming systems programs (especially CIMMYT and IRRI) and individual field practitioners. FSSP prepared and revised training manuals on on-farm experimental design, and analysis and diagnosis of farming systems.

Training in farming systems research and extension has been undertaken extensively through bilateral farming systems projects and formal courses planned and executed by FSSP in West Africa and Latin America, by CIMMYT in East Africa, and by the University of Hawaii, IRRI, and others in Asia.

Principals and practices of the farming systems approach are currently in the process of being institutionalized through training and field practice. How best to incorporate farming systems work into the standard operating procedures of national research and extension institutions is still being tried and tested. ISNAR is in the process of developing and analyzing case studies on the incorporation of the approach in national research

and extension systems. This effort should produce a synthesis of experience to date in this area.

2. Activities

On the matrix, the row headings indicate possible actions or activities which could/should be developed to improve the effectiveness of agricultural research and extension programs. Besides further work on traditional farming systems research, the range of possible activities include those designed to improve methodologies, deal with critical institutional issues, and establish formal linkages to the agricultural policy-making process. Each topic is briefly discussed below.

a. Improvement of Farming Systems Methodologies

(1) Farmer Participation

While research and extension activities are carried out on farmers' fields, it often happens that the farmer himself is merely a bystander or laborer and is not effectively used in either the research design or research evaluation processes.

(2) Crop-Livestock Interactions

Farming systems research had its origins mainly in cropping systems research, with little or no regard for the role or importance of livestock in farming systems.

(3) Gender Issues

In many areas of the world, especially Africa but increasingly so in Asia and Latin America as well, women are playing an important role in farm production systems as both decision makers and as providers of farm labor. Traditional research and extension systems often ignore this fact, with the result that the real users and potential evaluators of technology are misidentified.

(4) Technology Transfer

Farming systems research is necessarily site-specific, but the resulting technologies developed may have wider application than is currently believed. There seems to be a need to identify new technologies as well as the conditions under which they are feasible/viable so that they may be made available to researchers and farmers in other parts of the country or in other countries.

(5) Economic and Resource Sustainability

One area that does not always receive sufficient attention is the sustainability of new technologies, especially when they are designed for a specific set of circumstances which may be temporal in nature. This involves consideration of both the potential impact of the new technology on the natural resource base as well as the potential economic contribution toward maintenance of a viable family farming operation through adequate income levels at affordable input costs.

b. Institutional Issues

(1) Organization and Management

Farming systems research and extension is being implemented in several countries generally under a project that creates a special "farming systems unit" that is administratively and budgetarily separate from the rest of the host institution. As donor-funded projects terminate, or countries try to incorporate the approach into existing institutions without the benefit of a project, the question arises as to how to integrate, organize, and manage critical functions.

(2) Research-Extension Linkages

Questions continue regarding the dichotomy of research and extension and how these two can be successfully linked to form an effective technology generation and transfer system. Perhaps the farming systems approach, combining both research and extension at the field level, is the necessary integrator. The question still remains as to how to establish necessary linkages so that there is a more or less continuous backward and forward flow of information and technologies.

c. Policy Linkages: Farm-Based Policy Research

Agricultural policies, especially exchange rate and price policies, affect the private profitability of farm production and the attractiveness of new agricultural technology. New technologies are developed and/or introduced into specific policy environments that affect their adoption or rejection and the distribution of benefits between producers, consumers, and others. Farming systems researchers have intimate knowledge of the systems they are working with that would be useful to policy analysts in order to help predict welfare and production effects of alternative policies. It would also be very useful for farming systems researchers to understand how policy impacts on the technologies they are developing.

F. Priorities for Future AID Support of Farming Systems

Should AID decide to continue its funding and fielding efforts to farming systems support worldwide, there is a need to establish priority work areas that are of greatest interest to AID and to identify mechanisms through which support can be channeled.

It is obvious that different groups with legitimate interests in farming systems work will have different sets of priorities for future activities. Such groups include, but are not limited to, USAID field missions, AID regional bureaus, U.S. universities and others who participated in the Support Entity Network, the international agricultural research centers, the national research and extension systems that have received assistance in establishing and operating farming systems projects and programs, and other donors. Since budget limitations dictate that AID can neither support all activities nor place equal emphasis on those activities supported, it is necessary to make choices. The following is a suggested course of action for AID, based upon information provided by some of the interested groups, taking into account the limited resources available for farming systems activities.

1. Mechanisms for Future Support

It seems clear that whether or not AID/S&T takes any action at this time regarding funding of farming systems activities, work in this area will continue for the foreseeable future. First, there are several projects with farming systems components currently underway or in the planning stages, supported by AID as well as other donors. Second, as AID/S&T support for farming systems work is decreasing, support and activity by other organizations, such as the World Bank, IDRC, and the IARCs, is either stable or increasing. Within AID, the Africa Bureau continues to place priority on farming systems work as an integral part of its plan for agricultural research support. Third, the products of work during the previous five years, especially the training materials, are just emerging, providing the opportunity to further capitalize on previous investments.

At this point, there are three basic options that AID/S&T can consider with respect to future farming systems support. They are:

a. Discontinue Support

An argument could be made that the farming systems approach has matured, developed a widely accepted set of concepts and operating procedures, is currently being supported by other

donors, and thus requires no further support from S&T. However, the current consensus among practitioners as well as other donors is that there are a number of areas in which farming systems work needs improvement, as outlined in a previous section of this paper. Thus, given AID's leadership role in promoting and supporting farming systems early on through bilateral projects, synthesis of experience, and funding of the FSSP, it seems logical that at least a modest amount of support should continue to be provided.

b. Maintain Support at Previous Levels

Given the continuing importance of the farming systems approach as a strategy for development and transfer of agricultural technology to limited-resource farmers, it may be wise to fund a second phase of FSSP at a level and with a scope of work similar to the first phase. Questions arise regarding the nature of the design of the follow-on such as what activities are to be undertaken, the concentration of efforts in a region or regions, and who should implement the project. Most important is the availability of resources to fund such an effort in an apparently ever-worsening budget situation. Given that available funds are already programmed, there would be a considerable lag period before a new project could get underway, perhaps as long as three years.

c. Fold Farming Systems Into Other Projects

The basics of the farming systems approach are applicable to other subject areas as well as complementary to more general initiatives in agricultural technology generation and transfer. Thus, it may be possible to continue to support farming systems work under the "umbrella" of another effort. Two possibilities currently under consideration come to mind. First, Congress has mandated increased attention to the sustainability of current and future agricultural systems with regard to resource use and conservation, consistent with maintenance of acceptable family income levels. Conceivably, many elements of the farming systems approach could be used to concentrate on sustainability issues, especially with respect to the limited-resource farmer client group.

Another possibility would be to specifically include farming systems in a new effort, the Agricultural Technology Initiative, now being designed (concept paper stage) for possible funding and implementation by S&T. The purpose of the initiative is to assist AID field missions and developing countries in the improvement of national systems for agricultural technology development, transfer, and education. Work already done on farming systems would certainly make a significant contribution to the achievement of this objective, as well as provide continuity from previous efforts.

d. Establish a Farming Systems Secretariat

Given modest budgetary support (\$100,000 to \$300,000 per year), it would be possible to set up an independent secretariat to act as an information clearinghouse and promoter for future farming systems work. The secretariat would consist basically of a small professional and administrative staff consisting of a program leader, a data base management specialist, a grantsmanship advisor, and a secretary. The activities of this core staff would be overseen by an advisory board consisting of highly-respected farming systems practitioners and donor representatives. The functions of the secretariat would be as follows:

- o Act as a central clearinghouse for farming systems-related information.
- o Establish a new Farming Systems Network consisting of all individuals and institutions interested in continuing farming systems development work worldwide. Membership in the network should be greatly expanded past the current FSSP Support Entity Network to include the IARCs, RARCs, NARS, and others who have made significant contributions to the development of farming systems methodologies and are in a good position to collaborate on future efforts.
- o Establish and maintain linkages with AID and other donors in order to assure continued financing for maintenance of the secretariat's core activities as well as support for specific initiatives.
- o Help coordinate the supply of and demand for expertise in farming systems by:
 - a. assisting Farming Systems Network members to encounter funding sources from among the interested donor community to support farming systems development and networking activities;
 - b. maintaining a data base of individuals and institutions with proven farming systems expertise, especially in the areas of training and technical assistance; and
 - c. stimulating the demand for farming systems expertise by promoting the basic ideas and concepts of farming systems development among the donor community and the potential adopters of farming systems methodologies.

In general, the secretariat is envisioned as a coordinating mechanism rather than an implementing mechanism as was the

FSSP. It should as far as possible try to maintain an impartial and independent stance regarding implementation and funding, with all interested and capable parties receiving equal access to information and consideration for tasks that the secretariat may help generate.

2. Recommendations

The major ideas and concepts underpinning farming systems work continue to enjoy strong support and acceptance from the international donor community and the cadre of individual and institutional participants who have been involved in farming systems activities in recent years. Given AID's leading role in promoting and funding the approach, as well as the original ten-year scope of FSSP, S&T would be remiss if some level of support for the effort were not forthcoming. On the other hand, budget realities and a reduction in the lack of political support for a high level of activity in farming systems would tend to preclude a second phase of FSSP. Furthermore, given the level of activity in terms of bilateral technical assistance projects as well as strong interest of other donors, current levels of support to ongoing activities may be sufficient so as not to require another large project.

The farming systems approach should definitely be considered for incorporation as a component in new projects and programs that deal with agricultural technology and issues relating to limited-resource farmers. Specifically, the approach should be part of an overall technology development and transfer strategy that looks at all parts of the research and development-extension-evaluation-adoption continuum. It offers a way of conceptualizing and developing the key institutional and informational linkages in the process which heretofore have not been present in traditional research-extension systems. Furthermore, the farming systems approach could contribute to the analysis and resolution of issues related to long-term sustainability of agricultural systems, given its client-oriented focus which provides knowledge regarding farm family needs and behavior.

It is far more important that the experiences and lessons learned from attempts at implementation of the farming systems approach be incorporated into the standard operating procedures of individuals and institutions involved in agricultural development, than is the survival of the term "farming systems." However, as stated previously, a number of activities need to be undertaken to fully realize the progress already achieved, as well as a number of areas that should be developed further to improve the efficiency and effectiveness of the technology development process. It is in the interest of AID/S&T to be involved and provide leadership in these areas. In order to ensure that this is accomplished, it is recommended that AID

seriously consider funding a secretariat similar to that described above to act as a focal point for ongoing activities and networking related to farming systems.

Specifically, S&T would provide "seed" funding to enable the establishment of the secretariat, including rental of office space and equipment, employment of a small core staff, travel and other operating expenses for the first year. The suggested funding mechanism would be a grant. If AID resources are insufficient to fully fund this activity for a year, then AID should solicit collaboration from other donors such as the World Bank, the Ford Foundation, the Rockefeller Foundation, and IDRC. In fact, even if funds are available, collaborative funding may be advisable in order to ensure broad interest and participation. The costs of starting up the secretariat could be reduced by placing it within another institution such as AID or the CGIAR Secretariat. In any case, care would have to be taken to ensure the operational independence of the secretariat so as to encourage broad participation from all of the major practitioners as well as donors.

One of the first tasks of the new secretariat would be to work to ensure its longer run survival by establishing self-financing mechanisms to be in place by the end of the first year. Such mechanisms could include:

- o establishment of Network membership dues;
- o solicitation of long-term pledges of funding from international donors and member institutions;
- o establishment of a referral fee to be charged to Network member institutions that receive new business as a result of the secretariat's promotional efforts; and
- o collection of proceeds from sales of subscriptions to network newsletters and other publications.

G. Prioritization of Future Farming Systems Activities

This section is based on the premise that AID will indeed continue support to farming systems work in some form. It presents a set of priority activities for consideration derived from the views and opinions expressed by various parties interested in strengthening and fostering the farming systems approach. Specific information is included in the appendices regarding the preferences expressed by the support entities of FSSP as well as a selection of AID field missions.

1. Conduct of an Impact Assessment

Although many projects and programs have been undertaken utilizing the farming systems approach, information regarding their impact on factors such as technology adoption, farm incomes, and national research and extension system performance are scarce. A comprehensive examination of the successes and failures of several programs and projects should be undertaken in order to further clarify the expected benefits of the approach, as well as to provide additional guidance as to where future work must be concentrated. Such a review should include AID projects, efforts supported by other donors, and the activities of the IARCs.

2. Farming Systems Training

A great deal of the FSSP effort has gone into preparing training materials drawn from the collective experience of farming systems practitioners worldwide. There remains at the field level substantial interest in providing technical assistance in training, and the capability to deliver that assistance has been developed through the FSSP Network and the IARCs. AID/S&T can further support training by facilitating publication and distribution of training materials and keeping field missions aware of where available technical expertise may be found. Provisions need to be made to facilitate updating of materials as new lessons are learned and to incorporate new areas of knowledge as they are developed.

3. Institutionalization of the Farming Systems Approach in National Research and Extension Systems

Virtually all farming systems projects are linked with national research and extension systems in a variety of ways. Often they are attached as independent units with separate budgets because of the high recurrent costs associated with on-farm field work and the danger of diversion of funds toward other activities. As projects terminate, farming systems units will have to find ways to compete for scarce resources with other parts of the system. Difficult choices will need to be made between employing larger numbers of people and maintaining a smaller force but with adequate tools to do the job at hand. As mentioned previously, ISNAR is currently taking a look at current experience with this issue. The results of that exercise should be carefully examined to determine what steps need to be taken in the future.

4. Transfer of Farming Systems Technology

In order to become more cost efficient, the technological recommendations stemming from site-specific farming systems work should be transferrable to other areas with similar

ecological and socioeconomic conditions. Technologies developed in one country may in fact be applicable in other countries, and can be incorporated into the research-transfer continuum at a later stage of development. What seems to be lacking at this point is a mechanism to properly catalog new technologies, including providing complementary information regarding the conditions under which they are effective. AID should look into ways to catalog technologies so that they can be easily disseminated within countries, across borders, and perhaps even across continents.

5. Linkages Between Farming Systems and Policy

In conducting farming systems research, researchers often obtain data and other types of farm-level information that is potentially valuable to agricultural policy analysts. In the same vein, farming systems researchers could benefit from a clearer understanding regarding how agricultural policies influence technology design and adoption. Very little has been published in this area. Efforts need to be made to determine what has been done and what can be learned from experience so far. From there, a conceptual framework could be developed to demonstrate how these linkages could best be accomplished and their potential relevance and contribution both to farming systems work, and agricultural policy analysis and formulation

6. Communication Among Practitioners

The functions previously performed by FSSP, collectively called networking, served to keep practitioners and other interested parties informed about developments in the field, and provided an outlet for research results and other experiences. The mechanisms used were the newsletter, the annual symposium, technical publications called networking papers, and "networkshops" that brought together practitioners in a region to discuss specific topics of mutual interest. These types of communication mechanisms are essential so that individual experiences can be shared and group resources can be mobilized to work on pressing problem areas and targets of opportunity. These sorts of activities are best funded by a central organization such as S&T, given the difficulties associated with joint funding of such activities.

APPENDIX A

POSSIBLE FUTURE DIRECTIONS OF FARMING SYSTEMS SUPPORT

This appendix contains information regarding farming systems activities that could be implemented in future efforts. As part of the concept paper preparation process, all AID missions were asked to provide information regarding whether or not they consider the topics important for their program, whether or not they would be willing to financially support efforts in each area, and, finally, how they would rank each activity in order of importance. A sample answer form and tables summarizing mission response are included in this appendix.

A. Support of Ongoing Farming Systems Activities

This section presents some ideas regarding activities that are currently being undertaken by FSSP and others to promote the adoption of the farming systems approach in LDCs. All USAID field missions were queried as to the priorities they would place on each of the activities.

1. Training

Over the past few years, considerable progress has been made in operationalizing farming systems research and development in developing countries as well as in the United States. However, in many parts of the world, the process of learning and applying the farming systems approach is just beginning. In order to capitalize on the considerable investments already made in developing training materials and trainers, it may be appropriate to continue to provide both in-service and formal training.

- o In-service training programs, in the form of short courses and workshops, could orient and assist local professionals involved in agricultural research and extension toward more effective involvement and service to farmers. Such courses would either introduce the basic concepts of farming systems, or build upon the already existing knowledge and experience base. Ideally, the training would occur periodically on a regular basis, with the content of the courses changing as local institutions evolve and become able to adopt new methods of technology development.
- o Formal training could be targeted toward potential researchers and extensionists through local agricultural trade schools and universities. Rather than dealing

directly with students, support in this area would concentrate on training faculty and staff as trainers so that, over time, most of the training functions would become self-sustaining with minimal outside support.

2. Networking/Newsletter

Farming systems research as a methodology of technological development is constantly evolving, encountering new constraints and finding ways to address them. It is important that farming systems practitioners worldwide build and maintain communications linkages so that joint learning can take place, and people can be informed of new developments. Thus, support should be given for communication activities such as newsletters (regional, national, and worldwide), and the support and improvement of existing networks of practitioners who share information and help advance the state of the art of the farming systems aspects of agricultural research.

3. Farming Systems Symposium

Since 1981, the annual Farming Systems Symposium has brought together farming systems professionals from all over the world to share experiences, report on new developments, and renew and maintain personal and professional contacts. A new project could also support the organization of regional symposia in order to promote better communications among farming systems professionals working under similar environmental and cultural conditions.

B. New Directions in Farming Systems

Experience in undertaking farming systems projects has revealed areas of weakness in the farming systems approach as currently envisioned in being able to reach the goals of increased food availability and rural incomes. This set of topics deals with new directions in which farming systems work could be examined and addressed to improve the effectiveness of the farming systems approach as a development methodology.

1. Periodic Rapid Reappraisal

One of the drawbacks of the project approach to development is that once the project is designed and technical assistance is fielded, it is difficult to add activities to address unanticipated constraints that may arise preventing attainment of project goals. In order to address this problem, the new project could promote a periodic rapid appraisal approach to examine, besides farm-level technical and socio-economic constraints, conditions with respect to access and efficiency of agricultural markets, access and cost of credit, and the general price policy environment. This would be undertaken in specific

regions of interest to AID Missions to determine whether there is scope for significant technological and productivity improvements and to assess whether or not changes in productivity would likely result in increased household incomes, enhanced availability of food, and better management of the existing natural resources base. Service in this regard would be provided to Missions in the form of multidisciplinary teams to perform the rapid appraisal and offer guidance as to which factors are most limiting and should be treated by establishing linkages among existing projects and activities (e.g., between a farming systems research project and an agricultural policy analysis project)

2. Linkages Between Farming Systems and Policy

One of the criticisms that has been levelled at farming systems approaches is that they tend to take restrictive economic conditions (such as difficult access to credit and markets, low product prices, high input prices) as given and static. One of the possible roads to improved productivity is to relax economic constraints so that existing technologies can be adopted, or more productive technologies can be developed for a less restrictive environment. This points out the need for improved communication between farming systems researchers and planners/policy makers. In the process of farming systems research, information about farms and farm households is generated which could help policy makers understand the income and output effects of current policies as well as help predict response to policy changes. Efforts could be undertaken to help establish and maintain communication linkages so that farm and village-level information be available in a usable form, enabling decision makers to make better policy decisions. Such an effort build upon the recently-developed Policy Analysis Matrix methodology explicitly uses the micro-level cost and returns information commonly gathered by farming systems researchers as an aid in developing policy reform recommendations.

3. Technology Transfer

Though the farming systems approach incorporates concepts and methodologies relating to both agricultural research and extension, there is a continuing concern regarding the means for passing new technologies from the research community to the ultimate users, the farmers. INTERPAKS, a centrally-funded project looking at agricultural knowledge transfer systems, is exploring ways to make existing extension systems more effective in bringing about positive technological change. Through its emphasis on field work, a new project may be able to test and help develop new means and methods of effective technology transfer.

C. Evaluation of the Effectiveness of Farming Systems Work

This section presents two topics of interest in determining how effective farming systems work has been in the past, with a view to ratifying its strategy or suggesting modifications that may bring about better results.

1. Cost/Benefit Analysis

It is believed by many researchers that the recurrent costs of farming systems research and extension are generally higher than those for on-station research. To test this assertion, a possible new initiative could be undertaken to examine whether the added benefits of a farming systems approach, in which the clients are heavily involved in the technology development process, compensate for the added institutional and financial costs. This issue could be explored using a case study approach to document costs and benefits, not only in financial term but also in terms of the equity with which technological change benefits farmers as well as the effects of technology on the natural and cultural environments.

2. Integration of the Farming Systems Approach into Local Institutions

Farming systems efforts have been ongoing in various levels of intensity for several years. Has the farming systems approach been integrated into the standard operating procedures of local institutions, or is it a breed apart dependent on outside funding for its existence? How can (or can) the farming systems approach be integrated into national agricultural research and extension systems in order to improve the performance and responsiveness of the overall system? How has the responsiveness of the national agricultural research institutions toward small farmers changed? How are the multidisciplinary issues being handled in the various countries given the trained manpower shortages? These questions could be explored using a case study approach.

SAMPLE OF QUESTIONNAIRE SENT TO MISSIONS

1. How do you view the importance and relevance to your mission of each of the above types of proposed services and research issues? Would the mission be willing and able to share costs?

HIGH PRIORITY	A1	A2	A3	B1	B2	B3	C1	C2
MEDIUM PRIORITY	A1	A2	A3	B1	B2	B3	C1	C2
LOW PRIORITY	A1	A2	A3	B1	B2	B3	C1	C2
WILLING TO COST SHARE	A1	A2	A3	B1	B2	B3	C1	C2
UNWILLING TO COST SHARE	A1	A2	A3	B1	B2	B3	C1	C2

2. Please rank order functions according to their importance to your mission.

_____	Training
_____	Networking/Newsletter
_____	Symposium
_____	Periodic appraisals
_____	Policy linkages
_____	Cost/Benefit Analysis
_____	Integration into local institutions
_____	Technology Transfer Emphasis

RANK ORDER OF PRIORITY INTERESTS OF USAID MISSIONS IN FARMING SYSTEMS ACTIVITIES

RANKINGS	ACTIVITY							
	TRAINING	NETWORK/ NEWSLTR	SYM- POSIUM	PERIODIC APPRAISAL	POLICY LINKAGES	COST- BENEFIT	INSTITU- TIONALIZE	TECHNOLGY TRANSFER
BOTSWANA								
THE GAMBIA	4	6	7	8	1	5	3	2
KENYA	2	3	4	7	6	8	5	1
LESOTHO								
MALI								
RWANDA								
SOMALIA	1	2	5		4			3
ZAMBIA	4	7	6	5	1	8	3	2
REDSO/ESA	1	4	8	6	5	7	3	2
AFR MISSIONS AVERAGE								
RANK	2	5	6	7	3	8	4	1
SCORE	2.40	4.40	6.00	6.50	3.40	7.00	3.50	2.00
BURMA	1	5	4	2	3	8	7	6
EGYPT	2	8	5	4	3	7	6	1
FIJI		1					3	2
PAKISTAN	2	3	1			5	4	
PHILIPPINES	5	8	5	5	1	1	1	1
SRI LANKA	2	3						
THAILAND	8	2	1	5	4	6	3	7
ANE MISSIONS								
RANK	3	7	2	5(TIE)	1	8	5(TIE)	4
SCORE	3.33	4.29	3.20	4.00	2.75	5.40	4.00	3.40
BELIZE	1	7	8	2	3	6	4	5
BOLIVIA	3	7	8	6	2	1	4	5
DOMINICAN REPUBLIC								1
ECUADOR	1	2	8	3	4	7	6	5
EL SALVADOR	1	7	5	8	4	6	2	3
HAITI	2		4		3		1	
HONDURAS	1	8	7	2	5	6	3	4
JAMAICA	4	7	6	8	5	3	2	1
LAC MISSIONS								
RANK	1	7	8	5(TIE)	4	5(TIE)	2	3
SCORE	1.86	6.33	6.57	4.83	3.71	4.83	3.14	3.43
ALL MISSIONS								
OVERALL RANK	1	5	7	6	3	8	4	2
OVERALL SCORE	2.50	5.00	5.41	5.07	3.38	5.60	3.53	3.00

INDICATIONS OF SUPPORT OF USAID MISSIONS OF CURRENT AND FUTURE FARMING SYSTEMS SUPPORT ACTIVITIES

RANKINGS	TRAINING	NETWORK/ NEWSLTR	SYM- POSIUM	PERIODIC APPRAISAL	POLICY LINKAGES	COST- BENEFIT	INSTITU- TIONALIZE	TECHNOGY TRANSFER
BOTSWANA	H/N	H/Y	H/Y	M/N	H/N	?/N	H/N	M/N
THE GAMBIA	M/Y	M/Y	M/Y	L/Y	H/Y	H/Y	H/Y	H/Y
KENYA	H/Y	M/Y	M/Y	M/N	L/N	L/N	H/Y	H/Y
LESOTHO	H/M	M/N	L/N	L/N	M/N	M/N	H/N	H/N
MALI	H/?	H/?	H/?	H/?	?/?	H/?	M/?	H/?
SOMALIA	H/N	?/N	?/N	?/N	M/N	L/N	L/N	M/N
ZAMBIA	M/N	M/N	H/N	M/N	H/N	L/N	M/N	M/N
TOTALS AFR MISSIONS								
HIGH PRIORITY (H)	5	2	3	1	3	2	4	4
MEDIUM PRIORITY (M)	2	4	2	3	2	1	2	3
LOW PRIORITY (L)	0	0	1	2	1	3	1	0
COST SHARE? (Y)	2	3	3	1	1	1	2	2
COST SHARE? (N)	4	3	3	5	5	5	4	4
BURMA	H/N	L/N	L/N	L/N	L/N	L/N	M/N	L/N
EGYPT	H/Y	L/Y	L/Y	L/Y	M/Y	H/Y	H/Y	H/Y
FIJI	M/Y	M/N	L/Y	L/N	L/N	L/N	L/N	L/N
PAKISTAN	H/Y	M/Y	H/Y	?/?	L/?	L/?	M/Y	M/?
PHILIPPINES	H/Y	L/N	M/Y	M/Y	H/Y	H/Y	H/Y	M/Y
SRI LANKA	H/?	M/N						H/N
THAILAND	L/N	M/N	H/Y		L/N	L/N	L/N	M/N
TOTALS ANE MISSIONS								
HIGH PRIORITY (H)	5	0	2	0	1	2	2	2
MEDIUM PRIORITY (M)	1	4	1	1	1	0	2	3
LOW PRIORITY (L)	1	3	3	3	4	4	2	2
COST SHARE? (Y)	4	2	5	2	2	2	3	2
COST SHARE? (N)	2	5	1	2	3	3	3	4
BELIZE	H/Y	M/N	L/N	H/Y	H/Y	M/Y	H/Y	M/Y
BOLIVIA	H/Y	M/N	L/N		M/N	M/Y	H/Y	H/Y
DOMINICAN REPUBLIC	L/N	L/N	L/N	L/N	L/N	L/N	L/N	L/N
ECUADOR	H/Y	M/N	L/N	M/Y	M/Y	L/N	M/N	M/Y
EL SALVADOR			?/Y	H/?			M/N	
HAITI	H/?	L/?	M/?	L/?	H/Y	M/?	H/Y	M/?
HONDURAS	H/Y	L/?	M/?	H/Y	M/?	H/Y	M/?	M/?
JAMAICA	M/Y	L/N	L/N	M/N	M/N	M/N	H/M	H/Y
TOTALS LAC MISSIONS								
HIGH PRIORITY (H)	5	0	0	3	2	1	4	2
MEDIUM PRIORITY (M)	1	3	2	2	4	4	3	4
LOW PRIORITY (L)	1	4	5	2	1	2	1	1
COST SHARE? (Y)	5	0	1	3	3	3	3	4
COST SHARE? (N)	1	5	5	2	3	3	4	1
TOTALS ALL MISSIONS								
HIGH PRIORITY (H)	15	2	5	4	6	5	10	8
MEDIUM PRIORITY (M)	4	11	5	6	7	5	7	10
LOW PRIORITY (L)	2	7	9	7	6	9	4	3
COST SHARE? (Y)	13	5	9	10	10	10	10	10
COST SHARE? (N)	7	13	9	9	11	11	11	9

APPENDIX

RESPONSES TO QUESTIONNAIRE

Several members (20) of the FSSP Support Entity Network were asked to respond to a questionnaire that contained open-ended questions about their perceptions regarding FSSP performance and their views as to what activities should be included in a possible FSSP follow-on project. The question asked in this regard is as follows:

Do you think there should be a follow-on to FSSP? If not, why not? If so, what would some of the areas/activities that should be incorporated or focused on?

Twelve responses to the questionnaire were received. The following is a listing of the responses, with the numbers in parentheses indicating the frequencies of each response. As is clear, the majority of responses indicated strong preference for maintenance of activities associated with communications and networking, especially the newsletter, domestic networks and the symposium. The major substantive area frequently mentioned was the continuation of training in farming systems methodology.

- o Newsletter (10)
- o Networks (10)
 - Domestic (8)
 - Regional (2)
- o Training (7)
- o Symposium (5)
- o Library (1)
- o Institutionalization (1)
- o Regional Networks (2)
- o Policy Linkages (1)
- o Livestock (1)
- o Perrenials (1)
- o Evaluation of FSR/E (1)
- o Farmer participation (2)

- o Technology Information Bank (1)
- o Roster of FSR Experts (1)