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FINAL REPORT

Final Evaluation of
Pakistan Food and Security Management Project

and

Midterm Evaluation of
Technical Assistance Component/
Pakistan Agricultural Sector Support Program

USAID Project No. 391-0491

Submitted by

Winrock International Institute for Agricultural Development
Morrilton, Arkansas 72110 USA

and

Development Assistance Corporation
Washington, D.C. 20001 USA

Evaluation Team Members

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M. Mumtaz Ali
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Under IQC No. PDC-1406-I-00-0032-00
Delivery Order #08

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List of Acronyms

ABC	Agribusiness Cell
ACAP	Advisory Committee on Agricultural Policy
ACPAA	Advisory Committee on Policy Analysis in Agriculture
ACSCA	Analysis Corporate Sector Constraints in Agriculture
ADC	Agricultural Data Collection
AGBU	Economic Wing's Agribusiness Section
AIMS	Agribusiness Investment and Management Services Company (Also referred to as PATIAC in ACSCA's National Action Plan)
ARD	Agricultural and Rural Development Office of USAID
AFS	Area Frame Sampling
APAP-II	USAID Agricultural Policy and Analysis Project, Phase II
ASSP	Agriculture Sector Support Program
DAP	Directorate of Agricultural Policy
DWRC	Denver Wildlife Research Center
EAN	Economic Analysis Network
EPA	Economic Policy Analysis
FFGI	Food and Feed Grain Institute
FSM	Food Security Management Project
GCP	Ghee Corporation of Pakistan
GOP	Government of Pakistan
IBRD	International Bank for Reconstruction and Development
ICARD	International Center for Agriculture and Rural Development, Colorado State University
IESC	International Executive Service Corps
IFPRI	International Food Policy Research Institute
KSU	Kansas State University
MACS	Market Analysis Computer System
MINFA (MOFA)	Ministry of Food, Agriculture & Cooperatives
NARC	National Agricultural Research Center
NASS	National Agricultural Statistics Service
PARC	Pakistan Agricultural Research Council
PASM	Pakistan Agricultural Sector Model
PASSCO	Pakistan Agricultural Storage and Services Corporation
PHM	Postharvest Management
PIDE	Pakistan Institute of Development Economics
SPOT	French Satellite System
SRD	Samuel R. Daines Research and Development Groups, Inc.
SRS	Statistical Reporting Service
SSP	Special Studies Program
STDT	Storage Technology Development and Transfer
SUPARCO	Pakistan Space and Upper Atmosphere Research Commission
TA	Technical Assistance
TARI	Tropical Agricultural Research Institute
TIS	Trade and Investment Service
USAID	U.S. AID Mission
VMS	Village Master Sampling
VPCP	Vertebrate Pest Control Project

Currency Equivalents and Weights and Measures

1 US $	=	23.77 Pakistani Rupees (June 1991)
1 Kg	=	2.204 pounds
metric ton	=	1000 Kg or 2204 pounds
ha	=	2.247 acres
mil	=	1.6 Kilometers
acre	=	43.560 sq. ft
1 acre	=	0.405 ha
Maund	=	40.0 kg

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Executive Summary

Background

The 5-year Pakistan Food Security Management (FSM) Project was approved in February 1984 with total funding of $39.5 million ($35 ESF grant and $4.5 Government of Pakistan (GOP) contribution). The purpose was to improve the analytical and policy formulation framework, managerial capabilities, and physical capacity of the GOP to manage the national food security system. This was to be accomplished through three related components: (1) economic and policy analysis, (2) agricultural data collection, and (3) postharvest management.

Following the completion of FSM in June 1991, an umbrella follow-on project, the Agricultural Sector Support Program (ASSP), was designed. This 6-year program supplied $600 million to provide balance-of-payments support and to encourage the adoption of difficult but needed policy reforms within the agricultural sector. Policy reforms were intended to bring prices in line with international levels, decrease GOP's competition with and regulation of private-sector activities, and to reduce budgetary subsidies to the agricultural sector. To support rapid implementation of these reforms, ASSP is working to provide resource transfers in the form of a commodity import program, sector grants, and training and technical assistance (TA).

This assessment covers the final evaluation of the FSM project and midterm evaluation of the technical assistance component of ASSP. Its purpose is to assess the degree to which project goals were achieved over the life of FSM and progress made thus far in achieving targets of the TA subcomponent.

Principal Findings

Policy reforms already implemented and storage facility rehabilitation were conservatively estimated to save GOP Rs. 3,863 million annually in subsidy reductions and savings in wheat storage losses. A portion of the savings in wheat losses represents an import and hence, a foreign exchange saving. An additional one-time saving of Rs. 986 million in public-sector borrowing for construction of new storage facilities resulted from rehabilitation of existing buildings. Increased accuracy of crop forecasts provides a potential saving represented by reduced storage requirements/imports to assure food security. Establishment of institutions for improved policy formulation and trained staff represent long-term project benefits that can not be quantified.

FSM was initially slowed due to GOP delays in approving implementation documents, Ministry of Defense concerns over the use of aerial photos for the Agricultural Data Collection (ADC) component, obtaining GOP tripartite agreement for the postharvest management component, and the inherent difficulty of bringing policy change in a politically sensitive area. A combination of factors came together in the last half of FSM that brought remarkable institutional and policy changes and physical and managerial improvements. Major project strengths can be summarized as follows:

- Institutional change created the Economic Wing to serve as the focus of economic and policy analysis in the agricultural sector.
- Project analysis, in combination with Mission benchmarks to determine grant allocations and changed GOP philosophy, contributed directly to policy reforms that reduced the level of subsidies, increased foreign-exchange balances, and reduced the need to borrow for construction of grain storage.
- Effective project design resulted in mutually supportive components consistent with USAID's Country Development Strategy Statement.
- Well-conceived efforts increased private-sector investment and participation in policy-making.
- Well-qualified technical-assistance advisors and motivated USAID managers have overcome initial obstacles in moving the project to a successful completion.

The evaluation also concluded that several deficiencies remain, and component workplans for the remaining life of ASSP largely directed to their improvement. Delayed implementation of some components reduced the project's early effectiveness. Agricultural data collection has not yet produced useable national-level crop estimates, the Economic Wing is still in need of strengthening as an influential, analytical entity, and the feasibility of bulk grain handling under local conditions is unresolved. It remains to be seen if GOP has the ability and willingness to sustain all components as a core effort to bring permanent policy reform.

Failure of the Ministry of Food, Agriculture, and Cooperatives (MINFA) economic units to work together in a cohesive, supportive manner diminishes overall capacity for rational decision-making and contributes to duplication of effort.

Economic Policy Analysis. Evidence of an increased institutional capacity to analyze policy issues is shown through creation of the Economic Wing in July 1990, training and equipment received through FSM and ASSP, and production of useful economic analyses. A major objective of ASSP is to continue strengthening this institut' n and expanding its capacity.

The economic analysis network is a useful and viable concept to improve agricultural policy-making process. For example, a series of analytical policy studies has served as the basis for significant GOP policy reforms and continues to serve as catalysts for change. Contribution of the International Food Policy Research Institute's (IFPRI) Special Studies Program and benchmarks established under the USAID-funded Agricultural Policy and Analysis Project, Phase II (APAP-II) have been especially valuable in bringing policy reform. The network is still short of reaching its potential; however, the following deficiencies remain:

- GOP has not increased its support to replace USAID funds used for publications and other network activities
- the Economic Wing does not yet have a consistent record of in-depth, analytical inputs into the decision-making process
- the need exists for greater linkages between MINFA economic units.

Several examples of agricultural-sector policy reform flow directly from analysis provided by the IFPRI and APAP-II subcomponents. In particular, analyses completed within the

economic area network contributed to the termination of the ration-shop system, adjustment of wheat procurement and release prices to reduce subsidies and encourage private-sector participation in storage, the ending of mark-up free credit with consequent budget savings, and the decision not to borrow funds from the Asian Development Bank to build grain storage. Future efforts will become more productive as the Economic Wing matures. The Wing must increase its analytical capability and concentrate more on macro-policy tradeoffs; there must also be a strengthening of supportive linkages between MINFA economic units.

Agricultural Data Collection. Agricultural data collection has encountered delays in applying the area frame sampling methodology. Delays include a reluctance of the Ministry of Defense to approve use of aerial photos for mapping, and lag in obtaining GOP approval for moving from a pilot effort to a nationwide survey. Current plans are to produce the first provincial estimate in January 1992 and first national survey in July 1993. Success will provide several benefits: crop estimates will be available 90 days earlier than the present system, estimates will be unbiased, and the process will be more cost effective. These gains translate into macro benefits of budget-saving decisions and more targeted policies for setting purchase and release prices for grains. This component has already been successful in supplying training and equipment to strengthen the ability of provincial and federal officers to analyze a broad range of agricultural issues.

Postharvest Management. This component was successful in achieving tangible benefits in national grain storage and handling. Over the life-of-project, 578,900 tons of storage capacity were rehabilitated; this, in combination with training of managers and operators, has resulted in a 3% annual reduction in wheat losses. In addition, training of other managers and operators has reduced wheat losses 1%, or Rs. 26 million annually. Demonstrating the feasibility of storage rehabilitation also saved the GOP from additional borrowing for new storage construction.

The postharvest management component has been delayed in completing its research to determine the feasibility of bulk grain handling. Economic analysis is not yet available, but potential gains include a 45% increase in storage capacity and the opportunity for private-sector manufacture of equipment. To date, the component has not institutionalized the training capacity needed to sustain gains made thus far.

Promotion of Agribusiness Activities. The project's agribusiness activities have supported current government policy towards greater market orientation. Specific accomplishments include gaining recognition within the GOP of a larger role for the private sector in the policy process, establishment of an Agribusiness Cell (ABC) within MINFA, and completion of several studies to aid in policy formation and to stimulate private-sector investment. As a result, potential investments in excess of $50 million are anticipated in commercial seed production, citrus juice processing, and edible oil/feed mills; an agribusiness policy will be included in the national agricultural policy; and, the feasibility of exporting high-value commodities has been demonstrated. A need to develop working linkages with the Economic Wing, ABC, and RONCO Consulting Corporation remains.

Lessons Learned

1. Projects focused on policy change generally take longer to mature and achieve their results distributed over a longer time period than those directed to physical outputs. Flexibility in project design that permits adjustment during implementation is essential for success.

2. Successful economic and policy analysis units will establish effective vertical linkages to coordinate with policy-makers. Similarly, it is necessary to establish horizontal working relationships with complementary organizations that use results and contribute data.

3. The grain storage component successfully demonstrated the feasibility of rehabilitating storage facilities reducing the need for new construction.

Recommendations

The evaluation team recommends that:

1. USAID continue technical-assistance support to the ABC to capitalize on current GOP interest in the private sector and to provide a bridge between this project and a proposed multinational donor effort.

2. Working linkages be developed between the ABC, Economic Wing, and Directorate of Agribusiness in the Pakistan Agricultural Research Council (PARC). A clearer definition of each's role is needed, as well as improved coordination among these entities.

3. An AID/GOP negotiated benchmark provide for one increase in pay grade for the Director General and three directors of the Economic Wing to attract and retain qualified staff. For long-term strengthening, a minimum of four pipeline external trainees should be assigned to the Wing upon return; funds should be made available for further training of existing staff. The planned manpower study would serve as the basis for staffing and training in the Wing.

4. MINFA create a committee to link and coordinate economic analyses. This body would be chaired by the Secretary of MINFA, and would include representation from the four provincial governments, national research institutes and universities, and Ministry economic units.

5. A technical-assistance firm be contracted for grain-storage management to ensure institutionalization of a continuing capacity to train operators and managers of storage facilities.

6. AID project managers ensure the present delivery schedule of usable national-crop forecasts for major crops.

I. Introduction

I.a Background

The Pakistan Food Security Management (FSM) Project was designed to achieve food-security objectives of the GOP in a manner consistent with the rational and efficient use of national resources, overall economic development of the country, and an improved standard of living. Project objectives are to improve the government's analytical and policy-formulation framework, managerial capabilities, and its physical capacity to manage the national food-security system efficiently and effectively. These objectives would be accomplished through three related components:

- Economic and Policy Analysis (EPA)
- Agricultural Data Collection (ADC)
- Postharvest Management (PHM).[1]

FSM provided total funding of US$39.5 million ($35 million ESF grant and $4.5 million GOP contribution) starting July 1985.

A midterm evaluation of the project found significant accomplishments, although initial implementation had been delayed.[2] Rate of progress at midterm for the three components was uneven, with achievements being highest in the case of EPA, followed by ADC, and PHM. Recommendations were made to accelerate progress, increase the rate of project institutionalization, and increase contributions to policy analysis capability.

With the completion of FSM in June 1991, the Agricultural Sector Support Program (ASSP), a follow-on project, was designed. This 6-year program provides needed balance-of-payments support to the GOP and lays groundwork for sustainable development by encouraging adoption of difficult but necessary policy reforms in the agricultural sector. The policy reform and program support elements are closely related with annual support tied to Pakistan's success in meeting benchmarks negotiated in the previous year.

Policy agenda for the ASSP has served to bring prices more in line with international levels, reduce GOP competition with and regulation of private-sector activities, and lower budgetary subsidies to the agricultural sector.[3] ASSP, with an original funding level of US$600 million, includes three components to promote rapid implementation of policy reform within the agricultural sector: resource transfers in the form of a commodity

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[1]US Agency for International Development, Project Paper: Pakistan Food Security Management, (Washington, D.C., February, 1984), p 2.

[2]Robert R. Nathan Assoc., Evaluation of Food Security Management Project in Pakistan, (Islamabad, February, 1988), p. v.

[3]US Agency for International Development, Program Assistance Approval Document, Pakistan Agricultural Sector Support Program (Washington, September 24, 1987), p. 2.

import program ($270 million), sector grants ($270 million), and training, technical assistance, and other ($60 million). Program revisions necessitated by the Pressler Amendment, have considerably reduced the size of the components. Only the technical-assistance subcomponent is analyzed in the present evaluation.

The two projects were designed against an economic background where agriculture is an essential part of the national economy, food security for a relatively rapidly growing population is a humanitarian and politically sensitive issue, and where a fragile macroeconomy is manifested in chronic balance-of-payments and fiscal deficits. This environment continues in place and validates the overall development strategy and the project design.

I.b Project Resources

FSM was approved in February 1984 for a 5-year period with total amended funding of $39.5 million -- $35 million ESF grant and $4.5 million GOP contribution (**Table 1**). Almost half of committed project resources went to training and technical assistance. Other significant expenses included 19% for grain storage rehabilitation, 12% for commodities, and 16% for local costs (procurement and services). Disbursements in the first half of project life lagged planned rates, but by the end of the project only training funds were seriously behind schedule.

Following the completion of FSM in June 1991, the follow-on program, ASSP, was funded for 6 years at US$600 million (**Table 2**). Approximately 90% of these grant funds went for balance-of-payments support. The remainder was generally intended to provide training and technical assistance to further the objectives of FSM. Commitment of project funds is approximately on schedule.

I.c Purpose and Scope of the Evaluation

The complete scope of work for the report comprises the final evaluation for FSM and midterm evaluation of the technical assistance subcomponent of the ASSP. The purpose of the evaluation is to ascertain the degree to which project goals and objectives were achieved over the life of FSM and progress made thus far in achieving the targets of ASSP's technical-assistance subcomponent. Development of an analytical capacity to formulate sound policies and institutional processes for sustaining this ability will be of special interest.

This assessment leads to recommendations for more efficient use of ASSP program resources for the remainder of project life, and describes lessons learned in both FSM and ASSP that will contribute to improved performance of future AID efforts. In addition to assessment of the use of project resources, the evaluation focuses on the overall developmental impact of the two projects on macro-economic variables and institutional performance and capability. The evaluation also suggests indicators for judging effectiveness in a policy-oriented project.

I.d Procedure

This evaluation covers the period since the midterm evaluation of the FSM project and approximately the first half of ASSP. The evaluation is guided by a detailed statement of work developed by the Agricultural and Rural Development Office (ARD) of USAID/Pakistan.

The five-person evaluation team prepared a workplan that was approved by project managers at USAID and GOP. This workplan included a proposed outline for the final report and procedures to be followed in seeking answers to questions posed by project managers. A specific time schedule was included for the evaluation that conformed with requirements of the statement of work.

The objective of the evaluation team was to provide management with information on the use of project resources in tracking progress toward outputs, purpose, and goals defined in the logical framework of the two projects. This information was expected to be useful to project managers in determining what, if any, changes are needed to improve project performance for these two activities, and to indicate lessons learned in a broader context for USAID programs.

One objective of the evaluation was to focus on the economic and developmental impact of the projects. Both projects stress policy reform and institutionalization of an increased analytical capacity to conceptualize and implement policies in the agricultural sector. The evaluation was concerned with long-term, macro impacts of policy activities flowing from the project to stimulate sustained economic growth and indicators by which these achievements might be measured. The evaluation was also concerned with documenting the complementarity between the several project components to ensure that the sum of all efforts contributed in a larger way than each would have alone.

To answer these questions and to directly respond to issues raised in the evaluation's statement of work, project documents, publications, and financial statements were reviewed to measure achievements against planned outputs. These quantitative measures were supplemented by qualitative judgments of intended project beneficiaries from both the private and public sectors, GOP ministries which were participants in the projects, and of resident technical-assistance staff, counterparts, and USAID officials. This information was supplemented with site visits to project activities to focus on constraints and means used to overcome them.

Information from these sources has been distilled into a report focused on project progress and answers to issues and specific questions posed by AID project managers. Analysis of the information obtained led to conclusions drawn from the findings and to recommendations for each project component with designated responsibility for follow-up. Judgments were supported where possible by quantitative data and throughout by the evaluation team's experience and training.

II. Economic Policy Analysis

II.a Background

The Pakistan Ministry of Food and Agriculture (MINFA) has the overall responsibility for national agricultural development. A critical element of this responsibility is the processing of agricultural information and the analysis of policies affecting the nation's food supply. In 1968, MINFA created the Planning Unit as the administrative body to conduct this task. It became evident that this Unit would need strengthening to be successful in performing the sophisticated analysis needed for rational, long-term policy decisions. Therefore, GOP sought the assistance of USAID to establish the Food Security Management (FSM) Project that would include needed strengthening as one of several components.

The purpose of FSM was to improve the analytical and policy-formulation framework, managerial capabilities, and physical capacity of GOP to effectively manage the national food security system. The project had three related components:

- Economic and Policy Analysis (EPA)
- Agricultural Data Collection (ADC)
- Postharvest Management (PHM).

EPA included two subcomponents, the Economic Analysis Network (EAN) and the Special Studies Program (SSP). EAN was created to establish a permanent, interrelated group of Pakistani organizations to coordinate and implement more policy-related analyses and to further develop their capabilities. SSP was to be conducted by the International Food Policy Research Institute (IFPRI) in collaboration with Pakistani researchers.

Expected project outputs from the EPA component were an established network fully staffed with qualified personnel, and an ongoing agricultural economic and policy analysis program based on an annual research agenda developed by a high-level MINFA steering committee. These outputs were supported by training, technical assistance, and other inputs to strengthen the analytical capacity of the institutions through a contract with IFPRI for the selected policy studies.

The Agricultural Sector Support Program (ASSP) is a follow-on project that builds on FSM's establishment of the Economic Wing, EAN, and completed policy analyses. A major purpose of ASSP is to provide technical assistance to the Economic Wing to increase its capacity to perform useful analysis and to institutionalize it.

ASSP technical assistance inputs total US$4.7 million over a 6-year period.[4] These resources include provision of long- and short-term advisors, and financing of economic studies and equipment.

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[4] US Agency for International Development, Program Assistance Approval Document (PAAD), Pakistan: Agricultural Sector Support Program, (Washington, September 24, 1987), Table I.6-III.

While ASSP seeks to complete programs initiated under FSM, its emphasis is much different. FSM was successful in producing a large volume of useful analytical material and in gaining appreciation of the need for analytical research. ASSP will be most concerned with institutionalizing the ability to perform such analyses and its use by policy-makers. Success will be judged by the quality, timeliness, appropriateness, and quantity of analyses, reports, and publications produced and used in policy-making.

II.b Situation

II.b.1 The Economic Analysis Network

Within the objectives of FSM, the EPA component was to strengthen the analytical capabilities of MINFA and to develop a sound institutional framework for making policy decisions. To accomplish this objective, an EAN was created with public- and private-sector organizations involved in the agricultural policy process.

Project implementation began a year later than scheduled and encountered a number of start-up problems. Once past these initial difficulties, the project has been successful in achieving many of its objectives. In particular, the need for rational, consistent policy analysis in the agricultural sector has been moved to the forefront of the national policy agenda. Overcoming the initial problems and achieving most of the project targets was the result of some innovative management by USAID. These efforts were assisted by dedicated effort of expatriate advisors, and desire on the part of Pakistani counterparts to improve their capabilities.

II.b.2 The Special Studies Program

IFPRI was selected to conduct the special studies because of its prior experience in similar efforts. A major IFPRI study of consumer subsidies and consumption patterns in Egypt was particularly pertinent to the situation in Pakistan. With at least two studies to be completed, possibilities included analysis of the food grain system and a consideration of alternatives to the ration shop system.

The underlying premise for these long-term, special studies was to provide an analytical framework on which to base policy actions. It was anticipated that independent research isolated from daily crises would facilitate more consistent and rational policy decision-making.

II.b.3 Agricultural Sector Support Program

Chemonics International, the FSM contracting firm, was selected to continue its technical-assistance support to the Economic Wing, and two long-term advisors were fielded in September 1990. Their successful integration into the working environment was assisted by previous efforts of the Contractor. It was supported by logistical arrangements in place, the USAID management team, and by the existence of the Economic Wing.

Unfortunately, the evacuation of advisors and USAID Mission personnel in January 1991 for 2.5 months interrupted initial project implementation. Progress has been further

slowed by delays in obtaining final GOP approval of the Planning Commission Proforma-I required for implementation. Failure to complete final document approval has not halted progress, but has created uncertainty, inhibited some activities, and slowed progress on others.

Benefits did accrue during the evacuation period -- this provided time to reflect on constraints and alternative approaches. A draft workplan was produced while awaiting return. Both prior to and after returning from the evacuation, considerable effort was expended in administrative/planning activities and in producing the first joint Economic Wing/EPA policy-related materials. An ambitious work schedule was outlined that placed emphasis on a closely integrated effort between the expatriate team and Economic Wing staff. The result is a greater emphasis on training of the Economic Wing staff and a refocused policy agenda.

II.c Analysis

II.c.1 The Economic Analysis Network

The EAN subcomponent had measurable success in achieving most project objectives (**Table 3**). Obviously, judging success in attaining objectives is in most cases a matter of degree. The discussion that follows focuses on project outputs achieved and recognizes shortcomings to be addressed.

Among the most noteworthy EAN accomplishments are:

- establishment of the Economic Wing
- creation of an economic network of participating individuals and organizations
- provision of training and equipment that has strengthened the capability of Pakistan institutions.

Remaining to be completed is the full institutionalization of the Economic Wing, and the further strengthening of the economic network. Some needs are: (1) establishment of an environment where it is possible to respond to immediate needs of policy-makers and still permit more in-depth analysis of less immediate issues, (2) definition of a policy agenda focused on priority issues, including greater emphasis on macro economic issues, and (3) strengthening of linkages and improved communication with other economic organizations.

Discussion of the items listed in Table 3 is presented below.

Item 1. The Economic Wing within MINFA was formed in July 1990 by merger of the Planning Unit and the Economic and Policy Analysis Project. Its existence is evidence of the agreed mandate to provide stronger institutional capacity to conduct economic and policy analyses. The Wing is fully staffed, has access to resources, and is functioning, although the GOP Planning Commission Proforma-I required for implementation has yet to be signed at all levels.

This major achievement did not occur until late in the project due to the inability to agree on precedent conditions and inadequate leadership by the Advisory Committee on Policy

Analysis in Agriculture (ACPAA); the committee met only two times during the life of project. The cost of such inactivity has been lack of direction of project activities and lost time in project implementation. The delay has also cast future doubt and concern regarding GOP's real interest in making full use of the Economic Wing.

Item 2. EAN was established in 1989 with a total of 449 individuals from approximately 22 organizations.[5] This board membership increased communication and cooperation among a variety of individuals and organizations involved in the policy process. Interviews by the evaluation team generally supported the usefulness of this concept and its implementation. The dissemination of economic materials, including the *Econogram*, was well received and helped establish formal and informal links among network members.

Unfortunately, most network activity came to a close with the completion of the EAN component in June 1990. GOP funds were not made available to continue publishing the *Econogram* or to make use of the established network. Unless resources are now made available to replace AID funding for publishing and distributing materials, the contribution of a major FSM activity will be lost.

The Economic Wing has not taken a leadership role in maintaining the network. Stronger effort is needed to involve member organizations of the network in planning activities, evaluating policy, and promoting the interaction of its staff with other analytical groups.

Item 3. Almost 13% of the FSM budget was allocated to training. The evaluation team was favorably impressed with interviewees' impressions of the overall value of this project input. In particular, short-term training for computer skills, and workshops and seminars that brought specialized training in economic and policy-making methods were highly valued. These activities reached almost three times as many people as originally targeted. Fourteen selected individuals also received advanced-degree training that has strengthened the network's analytical capacity. This is having a high payoff in the teaching and research efforts of the agricultural universities.

A shortcoming was the absence of graduate-level training for Economic Wing staff. Only four members hold external graduate degrees and none of the present trainees are assigned to the Economic Wing. Staff members have received valuable in-country training at Quaid-i-Azam University and one-on-one training from expatriate advisors. However, given the large contribution expected from this organization, more formal training is required.

Item 4. A major FSM planned output was an ongoing economic and policy analysis program. To assess effectiveness of this activity, the evaluation team used Economic Wing staffing, equipment, research agenda, and access to decision-makers as criteria.

The Economic Wing has 36 professional/administrative staff (13 in the Directorate of Agricultural Statistics, 13 in the Directorate of Economic Research, and 10 in the

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[5] Economic Analysis Network Project, EAN Membership Directory: 1989, (Islamabad, 1989), p. iii.

Directorate of Agricultural Policy). No external trainees are currently designated to return to the Economic Wing. There appears little likelihood that any immediate expansion is possible under present budget conditions.[6] Most disconcerting was the failure of the Economic Wing to employ four economists trained under the FSM project. Specific recommendations are made in the evaluation to address these shortcomings.

The project was successful in increasing the capacity for an ongoing program through the provision of computers and a variety of short-term training programs. In total, 41 computers and associated hardware and software were provided and are in use by universities, research institutes, and government offices that form the network.

The evaluation team was unable to determine the exact number of computers out of service, but a critical problem exists. In many cases, GOP funds were not made available for maintenance contracts or equipment repair. In other cases, where maintenance contracts were available, the contracting firm did not perform routine maintenance or was incapable of keeping machines in service. Future distribution should ensure that repair funds or reliable maintenance contracts are in place prior to release of equipment.

The workplan of the Economic Wing is fashioned in part from its predecessor, the Planning Unit, and personal desires of the MINFA Secretariat. Therefore, it is not surprising that the research agenda will be heavily weighted toward short-term, quick-response activities. This agenda, combined with good personal relationships, does provide excellent access to policy decision-makers, however.

There is a need to free more of the Wing's staff to anticipate policy-agenda items and to provide more in-depth analysis for decision-making. The result will be better targeted, internally consistent policies, with fewer erratic shifts and more direction to the support of national development planning.

Item 5. The EAN subcomponent has been exceptionally successful in its publication program. In total, 26 major publications and a number of additional reports were produced, far exceeding planned output. Eight studies were scheduled to be completed by the private sector but only seven were actually contracted. IFPRI conducted eight studies. The remainder were EAN/Directorate of Agricultural Policy (DAP) in-house reports completed by teams of expatriate consultants and MINFA counterparts. The objective was to jointly produce useful analyses and training. The ACPAA met in 1985 and approved 13 areas for conducting economic research; from these subject areas, the Chemonics/DAP teams produced 16 special reports.

Professional content of these materials varies by quality and relevance to Pakistan decision-making. The most severe judgment of their value is contained in a 1990 evaluation.[7] This report was critical of the publications on two points. First, evaluators

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[6] Interview with Mr. Muzaffar Ahmed, Secretary, Ministry of Food, Agriculture and Cooperatives, Islamabad, June 4, 1991.

[7] Government of Pakistan, Planning and Development Division, Evaluation Report on Food Security Management Project, Economic and Policy Analysis , (Islamabad, November, 1990) para. 30.

believed that, although counterparts were involved in each study, their participation was minimal. Second, it was felt there was inadequate coordination and direction by ACPAA in establishing research priorities. This evaluation team concludes that counterparts were participants in all studies and terms of reference were agreed with MINFA in all cases. It is clear though that the ACPAA and Technical Committee for Economic and Policy Analysis were weak in establishing priorities of value to the GOP. Consultants sought guidance and, when none was forthcoming, completed those assignments which they perceived to be of highest priority.

Seven studies contracted with private firms were generally of less-than-desired quality and policy impact. Major difficulties included the inability or unwillingness of these firms to employ competent professional staff, inadequate supervision and monitoring, and difficulty of private firms to obtain access to data held by the public sector. Future efforts are to be conducted only by firms carefully screened for professional competence and with adequate joint planning and supervision.

Additional Findings. Considerable effort remains to strengthen the Economic Wing and to institutionalize the network. Much is related to organizational change and establishment of research priorities and is being addressed by the ASSP workplan. Several specific conclusions may be noted.

A major activity in the DAP is the analysis of farm inputs and production issues. This attention may not be inappropriate given the importance of input subsidies and policy-determined product prices in the Pakistan agricultural sector. But to more accurately reflect the policy emphasis and to strengthen the aggregate nature of policy-making, these two sections should be combined and a third section created to focus on trade-policy issues. The trade section would consolidate efforts underway in several existing offices and would be expanded to reflect the importance of the external market in Pakistani agriculture.

The Aggregate Analysis Section would continue to stress linkages in the food and fiber system including development and utilization of an input\output model. One of the more valuable contributions of a staff economist group is the ability to provide decision-makers with timely information on the consistent and simultaneous impacts of a proposed change on key macro variables such as budget outlays, foreign-exchange balances, employment, inflation, farm income, and consumer expenditures. The modeling effort promises to provide this capability.

A different issue relates to coordination within the MINFA economic organization. Three economic analysis units exist in the Ministry: the Economic Wing, Prices Commission, and Social Sciences Division of PARC. It was clear to the evaluation team that a wide communication gap exists between these organizations and at best they work independently and in the worst case duplicate some efforts.

Each unit has an important role to play in generating economic information and analysis. PARC and the Prices Commission tend to be micro-economic while the Economic Wing will have a comparative advantage in macro-economic issues. Given budget restrictions, it is vital that close coordination along these lines of specialization be strengthened by Ministry management.

Two organizational changes would facilitate good working relationships. First, the Director General of the Economic Wing is in Grade-20 while the other two organizational heads are in Grade-21. In a status-conscious society, such disparity necessarily leads to communication problems. A workable solution is to upgrade the status of the Director General, Economic Wing to a level equal to those in the other two organizations.

The other required change is also organizational. The Director General, Economic Wing, works under the direction of the MINFA Additional Secretary, while the other two organizational heads report directly to the Secretary. This absence of a common forum also widens the communication gap. The suggested solution is to have the Director General of the Economic Wing also work directly under the Secretary. These changes would elevate the status of economic and policy analysis within the Ministry and bring a greater measure of coordination among the three units.

Chemonics International performed especially well in selecting technically qualified advisors who have been accepted by Pakistani counterparts and MINFA administrators. Both short-term and long-term advisors have produced a wealth of policy-related materials for historical and future use. They were also frequently invited to participate in major policy-making councils, including preparation of the national agricultural policy. This indicates the advisors' excellent rapport with GOP counterparts. The evaluation team heard warm expressions of appreciation for their efforts.

In like manner, AID project managers were found to be innovative and highly motivated in overcoming obstacles to program implementation. Solutions were found for initial difficulties including an audit that recommended terminating major parts of the project. Specific creative approaches used for problem solution included:

- employment of needed Economic Wing local staff through the contracting firm
- development of training program at Quaid-i-Azam University
- coordination of the remaining FSM work program with the design of the follow-on project, ASSP.

II.c.2 The Special Studies Program

This project subcomponent has exceeded planned targets in both quantity and quality of publications. Specific sugestions were to develop a food-grain system model to evaluate alternative food-supply and price-stabilization policies, to complete a study of the ration-shop system to assess impacts of the system on food distribution, and to analyze the effect of alternative policies on food consumption and nutrition in low-income groups. These reports were to be completed over a 24-month period with primary data collected in Pakistan and analysis to be performed at IFPRI. Data collection and analysis was to be coordinated with Pakistan cooperators who would become more effective members of the EAN.

Collaboration with a number of institutions, research based on collection of survey data, logistical constraints, and political disturbances combined to slow progress.[8] Final reports

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[8] IFPRI, FSM Special Studies Project, Quarterly Progress Reports, USAID project files, Islamabad.

on the research projects were submitted on time in September 1987, however. Improvements and additions to research have continued to the present under a contract extension. As a result, eight principal publications and working papers have been produced under this subcomponent (**Table 4**). In addition, a number of working papers, journal articles (at least a dozen in the *Pakistan Development Review*), and comments originating from this activity have contributed to both policy-making and a larger body of professional literature.

Outputs of this subcomponent have considerably exceeded the list of studies planned over the life of project. Several of these studies and reports, together with associated workshops and policy dialogue, have been instrumental in changing the direction of the policy focus in Pakistan agriculture.

From 1988 to 1990, IFPRI completed three policy-oriented studies based on requests from MINFA. One reinforced the rural development concept and strategies and has influenced policies on education, infrastructure, health, and credit in rural areas. A second provided verification that subsidized institutional credit was not reaching the small farmer, particularly in Sind and Baluchistan. The third was a benchmark survey to assess the impact of mark-up free credit and an alternative mark-up of 7%. This study concluded that a drastic reduction in borrowing by large farmers occurred while the change had no effect on small-farmer borrowing. Consequently, GOP changed its credit policy and imposed a mark-up of 7% per crop season on all borrowing.

Another example of the studies' impact on policy change is the report on the ration-shop system published in 1988. This contributed to a 1987 GOP decision to terminate this means of distribution. Although not yet implemented, GOP has seriously considered increasing the release price of wheat at a faster rate than procurement price to reduce treasury outlay and to increase incentive for private storage. Full implementation of this recommendation contained in the 1988 study on wheat storage policy has yet to be achieved but the direction is clear. Linkages between other special studies and policy action is less defined but results have been presented in private and public meetings; these have already influenced present policy deliberations. Given the typical lag time for gestation of policies, they can be expected to be directly linked to future policy implementation.

Throughout its period of operation, the special studies component has served as catalyst to instigate policy action. While a large portion of the information was already available to economists, this component had access to policy-makers at the highest levels and was able to present material in a format that has led to policy decisions in some cases, and to reasoned debate in others.

A continuing contribution of the special studies subcomponent is the information base accumulated from 12 rounds of the consumer survey. Delays were caused by law and order situations and by a problem with one of the participating Pakistani institutes during data collection. These events slowed analysis, resulted in termination of the firm's contract and a reduced quantity and quality of data. Nevertheless, rural household surveys constitute a body of primary data not otherwise available, and represents a rich source of information for further policy studies. An additional achievement was the participation and training of several Pakistani counterpart organizations in the

completion of these reports. A work program under ASSP has been developed to utilize this resource.

II.c.3 Agricultural Sector Support Program

The common objectives of FSM and ASSP, combined with the continuance of the same people and/or institutions and prior establishment of the Economic Wing, offset delays encountered. As a result, progress to this point has exceeded that normally attained in similar project start-ups.

Particularly impressive has been the extensive integrated planning and preparation between expatriate advisors and Economic Wing staff. Considerable effort is being expended to overcome earlier difficulties in establishing full-partner working relationships and in training staff while completing useful policy analysis.

Tangible products of this process include:

- several iterations of a joint workplan for the two offices
- purpose statements for the Economic Wing and each of its directorates
- job descriptions for each position related to the purpose statement
- a training plan for Economic Wing staff
- a procurement plan for commodities and needed equipment.[9]

In addition, efforts have been made to install and implement several management tools, including a computerized monitor of staff performance and a database. Potential short-term gains from these activities are a reorientation of work programs, training of staff, improved management, and more useful policy analysis. Potential long-term benefits include institutionalization of an expanded analytical capacity.

Although a major effort thus far under ASSP has been toward institutionalizing the Economic Wing, there is also record of useful technical progress. A contribution widely recognized in Government has been an unplanned activity to produce an analysis of Pakistan's agriculture in the form required for the GATT negotiating team. This research, completed at the request of Ministry policy-makers, underscored both the value of long-term, analytical work and the need to increase interaction between Economic Wing staff and other organizations. The success of this effort was largely due to cooperation between project advisors and the Wing, and application of a methodology used in APAP-II, a complementary AID effort to establish benchmarks for evaluating GOP policy reforms.

A second significant contribution was the completion of a wheat situation and outlook report.[10] This report has value in itself as a policy-oriented publication dealing with the most politically sensitive commodity. It also serves as a prototype for a series of reports to

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[9] Economic and Policy Analysis Project, Quarterly Report: January, 1-March 31, 1991, (Islamabad, May 30, 1991), p. 15.

[10] GOP, MINFA, Wheat Situation and Outlook Report for Pakistan, (Islamabad, May, 1991).

follow. This publication was a closely integrated effort between appropriate staff in the Economic Wing and short- and long-term project advisors. As such, it served the objective of providing analysis while simultaneously improving skills of the Wing's staff.

A third ongoing activity demonstrates the development of tools to strengthen analysis and the benefits of a complementary relationship with other government units and AID projects. Further development and use of the Pakistan Agricultural Sector Model (PASM) in the Economic Wing can be a valuable asset. A major contribution of a staff economist group is the ability to provide consistent and timely estimates of impacts of a policy proposal on key macro variables. Modeling can provide such needed information if kept simple and the model building does not become the objective. The analysis of macro tradeoffs is largely a sense of direction of change rather than excessive effort to quantify magnitudes. This should be the objective of present efforts.

A variety of other activities have been initiated in EAN/Economic Wing. Many are related to organizational management, while others are subject-matter related, including a continuation of past Economic Wing programs. Some have yet to be successful and are being reappraised. These include the Policy Log -- designed to record and evaluate resource use by type of activity, workplan monitoring to assess performance, and regular joint meetings to encourage integration. In part, lack of success indicates reluctance to change from old methods of operation, and highlights the continued need to respond to ministerial requests for routine assistance. It also is a measure of the considerable effort ahead for full attainment of project objectives.

II.d Impact on National Economy

Several actions taken by the FSM have had national policy impact. These include:

- creation of the Economic Wing
- training of a cadre of economists in a variety of institutions
- provision of equipment to increase staff productivity
- organization of a network of agricultural economists
- productive record of generating policy reports and documents.

Several specific impacts on national policy-making may be cited. Efforts of an EAN team were instrumental to introduce and institutionalize concept of agribusiness.[11] It is now common to include income derived from linkages with farm input and product markets, as well as from the farm sector itself. This concept has been institutionalized with the creation of the ABC in MINFA and is being strengthened through efforts of a complementary AID project implemented by RONCO Consulting Corporation. A second significant impact has been the contribution of expatriate advisors and Economic Wing staff to draft and/or advise on present national agricultural policy and its predecessor policy.

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[11] Mubarik Ali, Forest Walters and Rao Shafique-ur-Rehman, Contributions and Interlinkages of the Food and Fiber System in Pakistan,s Economy, EAN Special Report No-12 (Islamabad, July, 1989).

ASSP can also be directly linked to national policy changes resulting in savings to public treasury outlays, creation of incentives for stronger private-sector participation, increased roles for women-in-development activities, and improved targeting of policy actions in agriculture and consumer welfare. Specific examples of impacts on national economy include the use of one study to eliminate the ration-shop system for wheat. GOP subsidies to consumers for ration-shop operations in 1985-86 totaled Rs. 3,232 million. This change is estimated to have reduced the overall cost of subsidies by 20% in an average year. Similarly, studies in agricultural credit have resulted in changes to reduce government-subsidy outlay without materially affecting the amount of credit used by small farmers.

ASSP, by using women to obtain survey data, demonstrated their effectiveness in development activities and led to wider use of females by the Bureau of the Census. A number of other studies have provided rational, alternative points of view to existing policies and have received attention at the highest policy levels.

The EAN has already had notable success in contributing to the overall AID program of policy reform. As a result of fortuitous circumstances and of having the needed capacity and technical assistance in place, the EAN/Economic Wing team developed a GOP response used by Pakistani negotiators in GATT discussions. This effort not only contributed to a national-level policy forum, but served as a demonstration of the effectiveness of an institutionalized economic-analysis unit.

II.e Conclusions and Recommendations

II.e.1 The Economic Analysis Network

A result of the EAN subcomponent was organization of the Economic Wing to assist GOP to implement more rational, long-term policies in the agricultural sector. To realize its potential, this organization must increase its capacity to produce needed products while elevating its stature within the GOP policy-making environment. This need has been widely recognized and formed the basis for the ASSP project. The availability of technical assistance, training, and equipment is designed to strengthen this organization and to increase marketability of its products. To be successful in meeting these objectives and in sustaining the activity, the following recommendations are made:

- Since a major activity of the Economic Wing is to increase economic literacy and to gain support for policy positions among the various MINFA constituents, a GOP budget allocation is necessary to continue distribution of materials begun with FSM. This would include publishing the *Econogram*, or comparable widely distributed publication on at least a quarterly basis, and more limited distribution of economic studies.

- The Economic Wing should refocus more of its work program on macro-economic policies. Given a fixed budget, this would dictate a relatively smaller resource allocation to present activities related to analyzing farm inputs and farm production. Most policy decisions reflect tradeoffs between such variables as budget costs, foreign exchange impacts, inflation, and consumer welfare and it is in these analyses that the Economic Wing can be most productive.

- To reflect this program orientation, the Economic Wing should reorganize its sections within the Directorate of Agricultural Policy. Farm input and farm production sections would then be combined into one group. The Aggregate Analysis Section could be expanded through additional staff and resources, while a third section would be created in the Directorate. The Foreign Trade Section would establish linkages with the Ministry of Commerce and the Central Bank and would be responsible for analyzing the impacts of trade-policy decisions on agriculture.

- MINFA should elevate the Director General, Economic Wing to Grade-21 and make this position administratively responsible to the Secretary to establish parity with the Chairman, Prices Commission, and Member, Social Sciences, PARC. This will improve communication and coordination between the three Ministry economic units.

- The planned manpower requirements study for the Economic Wing should be given high priority. The appraisal should be completed by a working group with large GOP participation to obtain a Government-wide view, and should consider upcoming retirements of present staff. The report and its expected recommendations for additional staff would then form the basis of a benchmark for AID funding.

- MINFA should immediately begin establishment of an Advisory Committee on Agricultural Policy (ACAP). A smaller, more decisive and more involved management link than the Advisory Committee on Policy Analysis in Agriculture must be forged with the Ministry Secretariat. ACAP would have 10 members, with the Federal Agricultural Secretary serving as Chairman. Other members would be the four Provincial Secretaries of Agriculture, Agricultural Development Commissioner, Chairman of the Prices Commission, Member of PARC Social Sciences Division, Chief of the Agriculture Planning Commission, and include the Director General of the Economic Wing as Secretary. A fixed schedule of meetings would ensure a minimum of four sessions per calendar year.

- Economic Wing management should take full responsibility to initiate cooperative efforts with other MINFA economic-related institutions. It is incumbent upon Wing management to ensure that traditional bureaucratic barriers do not limit its effectiveness. Effective joint-planning activities must begin early in the work program, not review what has already been completed.

II.e.2 The Special Studies Program

A Special Studies Program (SSP) is by its nature long-term and usually slow in achieving recognizable policy change. This has been recognized and AID funding extended to 1994 to cover a total 10-year period. Additional support may also be available from other donor agencies to support this work program. Given the impact of the research produced thus far, and the respect gained in policy decision-making, it is recommended that plans be made to institutionalize this effort in an economic policy center that would be insulated from the press of day-to-day policy-making and the change in emphasis of different governments.

There appears to be inadequate communication between institutions engaged in economic analysis in the agricultural sector. SSP has made efforts to reinforce linkages between the

Pakistan Institute of Development Economics (PIDE), PARC, the Economic Wing, and regional institutes. If its potential is to be realized, these efforts will need to be strengthened over the remaining life of project.

III. Agricultural Data Collection

III.a Background

III.a.1 Introduction

Importing wheat and other food items is an unacceptable burden on the country's balance of payments.[12] To enable GOP to manage its national food security system, food statistics should be available when needed and have a reliability level precise enough not to make a wrong decision on whether to import to cover the possible deficit or to export if there is a substantial surplus.

Currently available agricultural statistics do not meet the needs of policy makers and planners in terms of acceptable coverage, timeliness, and reliability. The Food Security Management (FSM) Project, therefore, designed the Agricultural Data Collection (ADC) component to bring about desired improvements in the present system for collection of agricultural data.

III.a.2 Improvement Elements

The main objective of ADC is the development and technology transfer of the area frame sampling (AFS) concept, a statistical method of selecting an agricultural sample based on objective characteristics of the agricultural system rather than arbitrary administrative boundaries. This concept is expected to improve the reliability and geographic coverage of the data collection system.

AFS construction uses aerial photos and photo mosaic and topographic maps of the total land area of a targeted population, such as a district or province. Land-use characteristics are then observed through the use of photo interpretation. Strata are assigned and stratum boundaries delineated on the mosaics.

Timely availability of agricultural statistics is expected to be achieved through regularly scheduled quarterly reporting. Implementation of an automated data processing unit will facilitate compilation and analysis of raw data and will eliminate errors associated with manual processing. This will make agricultural data available to decision-makers on a more timely, regular basis.

To forecast production prior to harvest, growth models will be developed for major crops; subsequently, objective measurements of major crops will be conducted.

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[12] Akhtar Mahmood and Forrest Walters, Pakistan Agriculture, A Decision of Pakistan's Agricultural Economy. Islamabad, Pakistan, December, 1990, pp. 14-15.

III.b Situation

III.b.1 Area Frame Sampling

Construction. In the pilot project -- Phase I, area frame sampling using low-level aerial photography of 1976, was constructed in seven pilot districts. In Phase II, entire country SPOT satellite imageries were used instead. As of June 1, 1991, 311 (81.4%) of 380 SPOT scenes were received from the Pakistan Space and Upper Atmosphere Research Commission (SUPARCO). The remaining 69 scenes will be made available to ADC when completed. These scenes are used for primary delineation of strata, with their boundaries transferred to topographic maps produced by the Survey of Pakistan. Detailed information on the progress of AFS is shown in **Table 5**. Remaining topographic maps to be received may not be released to ADC for security reasons; however, it is believed that most of the areas involved are in non-agricultural sections of the country.

For the extended period under ASSP, agricultural data collection will continue under the same organizational set-up as in the Pilot Phase. The primary objective will continue to be the development and technology transfer of the AFS methodology in Pakistan.

Stratification and sampling scheme of AFS. The target population was divided into homogeneous strata based on land-use characteristics. Strata definitions adopted for categories of land use in Pakistan are shown in Annex 12A. Details on the number of strata formed, total number of frame units, total number of segments, number of segments selected by enlargement, point sampling, and range of segment sizes by district is listed in Annex 12B. A sample size of 100-125 segments per district was used to provide statistically reliable estimates for acreage sown under major crops with a sampling error of 7%.[13]

A replicated, stratified random-sample design has been adopted for each district. There are four replications, and each has been drawn independently from each stratum. Frame or count units were formed in each stratum; units were then divided into area or sample segments. To select sample segments, point sampling was used in areas for which aerial photographs are unavailable due to security reasons, while other segments were identified from prepared topographic maps.[14]

Field surveys. The first crop-acreage survey was conducted in April 1987 to collect information on areas planted to Rabi crops and intentions for the coming Kharif crop planting in Sheikhupura. Later, other districts were included as their area was ready.

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[13] Government of Pakistan Performance Report of Agricultural Data Collection Component of Food Security Management Project, ADC Cell, Federal Bureau of Statistics, Statistics Division, p-12.

[14] Evaluation Report of Agricultural Data Collection Component of Food Security Management Project, July 1985 through June 1989 ADC Cell, Federal Bureau of Statistics, Ministry of Finance, Economic Affairs, Government of Pakistan, Islamabad, 28 August, 1989, p-3.

Crop-acreage surveys that have been conducted or are scheduled for the crop year 1990-91 are for areas planted to Kharif and Rabi crops.

III.b.2 Objective Measurements of Crop Yields

Objective-yield forecasting of wheat began in Sheikhupura and Nawabshah in April 1988. Estimates were used to make early season-yield forecasts a month or so before harvest of major crops. For cotton, maize, rice, and sugarcane three objective yield surveys were conducted in the 1988-89 planting year for four districts -- Nawabshah, Sheikhupura, Larkana, and Faisalabad. Two additional yield surveys were conducted for wheat in 1989-90 and 1990-91. Two surveys were also completed in 1989-90 and 1990-91[15] for cotton, maize, rice, and sugarcane.

Sample plots. To estimate yield of major crops, the number of experimental (sample) plots needed to provide statistically reliable estimates with a sampling error of 7.5% at district level is 90 for wheat and 60 each for cotton, rice, and maize. Experimental plot size, adopted on the basis of research carried out in the United States is shown in **Table 6.**[16]

III.b.3 Quarterly Collection and Dissemination of Agricultural Statistics

In consultation with provincial governments, a calendar covering all important crops was proposed in 1975. This calendar was based on planting seasons as well as requirements for different crop estimates. Data collection for area frame sampling is achieved through quarterly surveys; these are timed to coincide with summer and winter crop seasons. **Table 7** illustrates the type of data collected on each survey.

III.b.4 Automated Data Processing System

Scheduled publication dates presented in **Table 7** will make data available to decision-makers and other users on a more regular, predictable basis. Such a schedule is needed to establish confidence and credibility in the reporting system. A major cause of past delays has been the slow, costly, and inaccurate manual processing of data. To meet the users need for timeliness, FSM devised a network of micro- and mini-computers for automated compilation/tabulation of collected raw data between the AgriBusiness Cell (ABC), Federal Bureau of Statistics, and the Agricultural Data Collection component in the Punjab and Sindh.

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[15] Typed Progress Report of ASF based Crop Acreage and Objective Yield Surveys, FBS, pp. 1-2.

[16] Government of Pakistan, Performance Report of Agricultural Data Collection Component of Food Security Management Project, ADC Cell, FBS, p.13.

III.c Analysis

III.c.1 Area Frame Sampling

Reliability of acreage estimates of three major crops.[17] The objective of AFS is to estimate acreage and yields for major crops with a sampling error of 5% or less at the provincial level. Estimates with this level of precision at the district level would require large sample sizes, and would be costly in terms of both money and manpower; estimates with sampling errors of 5% at provincial levels are, however, considered precise enough to make policy decisions. Using results from the seven pilot districts, **Table 8** illustrates this for rice, cotton, and wheat acreage.

It can be noted that the highest sampling error for Punjab is 5.6% for rice, and the lowest is for wheat, 2.6%. Sampling errors for Sindh are somewhat larger due to a lower concentration of acreage in this province. However, higher errors in the Sindh do not influence national sampling errors since the highest is 4.7% for the 1990 rice acreage. As the survey is expanded into other districts, it is expected that errors will decrease substantially at the national level.

Estimates obtained using AFS and village master sampling (VMS) for wheat, rice, and cotton for crop years 1989-90 and 1990-91 are provided in Annex 12C. Wheat estimates for crop years 1989-90 and 1990-91 using these results differ by 4.25% and 4.08%, respectively. Differences for cotton were 1.46% for 1989-90 and 1.21% for 1990-91. In spite of small percentage differences in the estimates for wheat and cotton acreage, AFS methodology can deliver estimates with a high level of reliability. For estimates based on VMS samples, no similar level of reliability could be computed.

Timeliness of acreage estimates. One element introduced in the Agricultural Data Collection (ADC) component to ensure timeliness of agricultural statistics is the quarterly collecting and reporting of acreage and raw yield data in the field. The January 1991 AFS acreage-survey activity calendar (Annex 12D) shows target and actual dates for each activity. The time lag target and actual dates for various quarterly activities involved in AFS acreage surveys is small; for many activities, it is only a matter of days.

In spite of the short lag time between target and actual dates, this is still a considerable improvement over existing reporting schemes. For example, AFS estimates for the 1987-88 crop year were available on February 1, 1988, while official VMS estimates were on hand January 12, 1989, or 11 months later. AFS and VMS estimates for rice for 1988 were released within less than a 2 week interval.

For wheat, long-term intervals allow policy-makers ample time to make decisions using AFS estimates. For rice, AFS estimates still give users an additional 2 weeks compared to those who use VMS estimates. Besides unbiased yield estimates, the ADC subcomponent claimed production data could be available 60-90 days earlier than the release dates for existing methods. Target and actual dates of the Rabi wheat surveys for 1991 are shown

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[17] Ninth meeting of ADC's Technical Committee, Working Paper on Agenda II - Review of the Results of Surveys/Studies. Peshawar, June 1991, p. 1.

in Annex 12E. Target dates specified in the revised Planning Commission Proforma-I for first surveys of major crops in all four provinces are listed in **Table 9.**

By January 1993, the first acreage and objective-yield surveys of major crops will be completed for all four provinces of Pakistan. While the development phase of the ADC subcomponent has been concentrated in districts with well-developed agriculture, it may be desirable to study the AFS methodology in districts where agriculture is less developed than in the pilot districts. There is ample time to do this as the earliest provincial survey is not scheduled until January 1992.

By introducing the AFS methodology, it is expected that reliable and timely statistics can be made available when needed. There is no doubt that this methodology can produce acreage estimates of major crops with sampling errors of 5% or less at the provincial level. Estimates of this level are normally considered precise enough for making policy decisions, and will produce sampling errors of less than 5% at the national level.[18]

Through the analysis of available information, AFS-based surveys have consistently produced and released statistics at a much earlier date than existing systems. This early release of statistics allows policy-makers ample time to make decisions. Since the earliest provincial survey is scheduled for January 1992, there is still time to study the AFS methodology in districts where agriculture is not as well-developed as that in the pilot districts.

III.c.2 Objective Measurement of Major Crop Yields

Table 10 details sampling errors for objective yield estimates for rice, cotton, and wheat for 1989-91. Except for cotton, sampling errors of the three major crops at the national level are all less than 5%. At provincial level for Punjab (except cotton) the highest sampling error is 5.3% -- also for cotton. The small acreage in Sindh resulted in higher sampling errors for the province. Sampling error for these crops is expected to decrease substantially at the national level as surveys are expanded to other districts. A sampling error of 5% or less could be considered precise enough for policy decisions.

In general, objective yield estimates obtained using AFS are consistently higher than their corresponding estimates from VMS. For wheat, 1989 objective yields at the national level (seven districts) differ by 32.20%, and for 1990 by 17.50% (Annex 12F).

Large area percentage differences were also obtained for rice (Annex 12G). In 1989, rice yield estimates using AFS were 53.14% larger than that obtained with VMS, and in 1990 (Annex 12H), the difference was 49.01%.

For cotton, AFS and VMS objective yields for 1989 differed by only 1.34% (Annex 12G) but in 1990, the difference was 14.57%. A larger objective yield was obtained for cotton using VMS sampling (Annex 12H).

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[18] Ninth meeting of ADC's Technical Committee, Working Paper on Agenda Item II - Review of the Results of Studies/Surveys, Peshawar, June, 1991, pp. 1-2.

In a quarterly ADC report,[19] it was stated that the correlation of yields from the 21.6 square inch plots decreased slightly. As a result, it was recommended that two 21.6 square inch plots be placed in a field for each sample falling in the field. The two plots would then be collapsed into one at harvest time to give a better yield estimate for the field. The results of two plots versus one are shown in Annex 12I. The per-hectare yield from the two combined plots is 20.62% above the VMS yield.

A pilot wheat validation was conducted in Rabi 1991 to further study the cause of large differences between yield estimates of wheat using AFS and VMS methodologies. The objective of validation was to determine average yield per hectare realized by farmers.

In this pilot study, the enumerator watched the farmer thresh all the grain from the sample field; the grain was then bagged and weighed together to arrive at the total weight. This validation was conducted using a sample of 50 fields. Sample fields were distributed proportionately throughout the seven districts based on wheat acreage in each district. The result of the validation study compared with previous results is shown in **Table 11.**

Area frame sampling yielded the largest objective wheat estimates. Information obtained from the pilot study will be used to design a full-scale wheat survey in 1992.

Conclusions. Apparently, the use of a 21.6 square inch plot for wheat may not be the cause of the large difference in results using AFS compared to those obtained with VMS. Other factors could be the cause; for example, the delineation and location of sample plots should also be examined to determine if they contribute to the said difference. In addition, plot shape can be varied to study whether the border effect of a non-circular plot is a contributing factor.

III.c.3 Cost Efficiency of the New System

Development of Phase-I began in November 1985 and was completed in December 1988. Total cost incurred during this entire period was Rs. 19.457 million, and expenses to complete area frame samples for the country were estimated at Rs. 35.500 million (**Table 12**).

No development costs could be estimated for the VMS scheme started in the late 1970s.

Table 13 presents costs-of-survey operations using AFS and VMS schemes of sampling. VMS cost estimates were based on the Punjab 1989/90 budget, Sindh Agricultural Department's 1988/89 expenditures, and expenditures for NWFP and Baluchistan.

The cost of the two systems, AFS and VMS, could be expressed in resource requirements as shown in **Table 14.**

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[19] Agricultural Data Collection Component Quarterly Report. April 1 - June 30, 1990, Appendix 2, p.8.

The operation of a AFS system is comparatively cost-effective as it involves less manpower and much smaller sample while yielding reliable acreage/yield estimates and earlier results for better decision-making.

III.c.4 Training

The FSM Project included provisions for U.S. training of officers of the federal and provincial governments. Training fellowships provided since July 1985 are presented in Annex 12J.

The low utilization of foreign training is due to the difficulty that federal and provincial government employees have in the Test of English as a Foreign Language (TOEFL). Foreign-training slots available under ASSP for ADC project-related agencies are listed in Annex 12K.

The foreign-training plan is apparently in anticipation of the need for trained personnel to implement the proposed data collection under ASSP (see Annex 3). Vacant analyst/programmer positions reported in the Sindh province should receive priority so provincial staff could handle data processing activities independently of the ADC Project Office and Federal Bureau of Statistics cell. This will also avoid a possible backlog in the Islamabad offices.

Officers of federal and provincial governments also participated in local training courses, workshops, and seminars conducted by USAID-hired expatriate consultants. Local consultants also lectured on current in-country practices. Annex 12K delineates the subject matter, number of courses conducted, and number of participants for each type of training.[20]

The ADC Project Office will continue to provide training at the federal and provincial level in advanced word processing, spreadsheet graphics, statistical analysis, and database and survey management systems. In addition to technical support and advisory services for the project office, workshops on other uses of computers will be arranged through local computer firms.

Once all training slots shown in Annex 12L are filled and the in-country (local) training programs completed, federal and provincial offices involved can continue operation of the AFS methodology without outside help.

III.c.5 Technical Assistance

Effective technical assistance can only be achieved if needs have been properly assessed before project implementation and evaluated during the life of project. In the case of technical assistance extended to ADC, three subjects have been given more person-days than any others (Annex 12M). These include AFS construction, statistics, and primary data collection. For AFS construction, additional person-days given were necessary since

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[20] Government of Pakistan Performance Report of ADC Component of FSM Project, ADC Cell, FBS, Statistics Division, P 6-7.

the AFS methodology is being introduced to the country. Shortcourses in statistics and primary data collection could have been given less person-days, with addititional days allowed for objective-yield studies.

The new program of short-term consultants seems to have profited from experience gained on the technical assistance under FSM. The ADC short-term requirement is well anticipated in relation to the new data collection structure of ADC under ASSP. There may be a need to examine requirements due to budget cuts from $8.759 million to $5.633 million.

The Bureau of Census and other agencies may profit from the above experience in the assessment of technical assistance, and may avail itself of the facilities put up for ADC.

For the technical assistance requirements of surveys of the provinces, ADC staff prepared a schedule of short-term consultants (Annex 12N).

Other needed consultancies as outlined in the revised Planning Commission Proforma-I include a long-term senior resident statistician (team leader), with short-term consultants required in agricultural economics and survey methods (four), training in economic data systems (two), sample selection (two), objective yield studies (three), and livestock and poultry statistics (one).

III.d Impact on National Economy

In an underdeveloped area, a technically problem-free will be most appropriate. Annual cost of survey operations for area frame sampling is estimated to be about a third lower than that required by the existing system. At this point, development costs become fixed project costs not relevant to future decision-making.

The AFS scheme will require less manpower compared to the existing VMS system. If area frame sampling is adopted, trained manpower could be released to other statistical activities and/or to other sectors of the economy. Enough time should be given so that adjustments could be made by those no longer needed.

With quality statistics available, better economic planning, at least in the agricultural sector, can be achieved. Resource allocation can be improved.

III.e Conclusions and Recommendations

Analyses of survey results show that AFS can yield timely, cost efficient, and reliable agricultural statistics to policy-makers, planners, and other users. To improve a data-collection scheme found successful in many countries is not an easy task. However, the aforementioned analyses indicate that certain aspects of the implementation of field surveys can still accept changes.

AFS's development phase had been conducted in pilot districts where agriculture is well developed. The first provincial survey is to be conducted in January 1992, with a national

survey to be completed by January 1993. By surveying the four provinces simultaneously, ADC facilities could concentrate on one survey instead of two.

Considering the field conditions, the evaluation team recommends that the ADC component, Federal Bureau of Statistics, and the ADC subcomponent:

1. Survey all four provinces simultaneously so remaining funds could be best utilized.

2. Services of two or more consultants on related survey activities be done by only one consultant.

3. The size, shape, delineation, and location of objective sample plots be studied, especially for major crops, and include a circular cut. Square or rectangular plots have larger border effects than circular ones; thus, square plots used for wheat and rice could be a factor in different yield estimates.

4. Provincial Departments of Agriculture, through the Crop Reporting Service, continue participation in area frame sampling field activities.

5. Both the steering and technical committees continue their respective roles in the development and transfer of area frame sampling technology in Pakistan.

IV. Postharvest Management

IV.a Background

IV.a.1 Introduction

The GOP devoted significant resources to wheat storage in the early 1980s as part of its food security plans. This commitment was necessitated by increases in national wheat production over the past few years, and decreases the storage of wheat by 5.1%.

Wheat production increased 75% over the 10-year period 1971/72 to 1982/83. The increase from 7.0 to 12.3 million metric tons met a national goal of self-sufficiency with larger targets projected. Since the government purchased and stored a large part of the annual production, this increase required more government involvement in wheat storage.

The majority of public-sector storage facilities totaled approximately 3.5 million metric tons. However, much of the storage was concentrated in the Sindh and Punjab, and consisted of small *godowns* of only 500 to 16,000 metric tons capacity. Older *godowns* had deteriorated, leaving leaking roofs, broken or cracked walls, floors, doors, and windows that would not seal, and having inadequate fumigation capabilities.

Major problems in the postharvest management of wheat in Pakistan are summarized as follows:[21]

- Grain losses are high in the public sector, while declines in storage of wheat are estimated to be 5.1%
- Deterioration of storage facilities makes proper management difficult
- The management system does not encourage minimization of losses nor provides adequate information on which to base management decisions
- Quality-control measures are inadequate, endangering the health of employees, as well as increasing losses
- Integrated pest-management practices are not followed
- Little technology-application work is done either to adapt technologies to Pakistani conditions, or to transfer improved quality-maintenance techniques to operational personnel.

In 1984-85, it was concluded that Pakistan could reduce losses in wheat storage by 3% if the above problems were solved. This reduction in losses would have saved $13.5 million in wheat annually to Pakistan.

Given the above problems, the postharvest management component of the Food Security Management (FSM) project was designed to focus on inventory control and stock management, financial and cost accounting, quality control of stored grain, rehabilitation

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[21] R. A. Akhund, Secretary, Ministry of Food, Agriculture and Cooperatives; Planning Commission Proforma 1., May 1985.

and maintenance of physical facilities, bulk-storage design, and management and development of human resources. The project as described by the government in the Planning Commission Proforma-I, was expected to

- rehabilitate 750,000 metric tons of public-sector grain storage facilities
- train approximately 1,888 persons in-country and abroad in postharvest management technologies
- improve maintenance and management of storage facilities
- reduce storage and handling losses
- improve pest control and storage-design research
- develop in-service training programs in postharvest management techniques
- design a long-range plan to meet recurring repair and maintenance costs for existing and newly built public-sector, grain-storage facilities.

The Storage Cell within the Food Division of the Ministry of Food, Agriculture and Cooperatives (MINFA) was given major responsibility. The four provincial food departments had direct responsibility for programs in each of their respective provinces. The USAID/Pakistan Office of Agriculture and Rural Development (O/ARD) had counterpart responsibility for managing the project. Implementation of the postharvest management component was to be conducted through three subcomponents:

- **Storage Technology Development and Transfer (STDT) Unit** -- to implement activities in grain handling, storage-technology development, and human resource development

- **Pest Control Technology Development** -- to provide applied research and training in integrated pest management, including control of insects, vertebrate pest control, and pesticide safety

- **Storage Rehabilitation** -- to repair and rehabilitate approximately 750,000 metric tons of storage capacity.

Project inputs also included the provision of long- and short-term advisors. To meet projected human-resource needs, the project designed a comprehensive training plan to include overseas degree programs in entomology, storage engineering, pest management, and plant pathology. In addition, the project would conduct short-term study tours in bulk-storage design, vertebrate pest control, storage management, and stored grain research. In-country training was to include courses in quality control, grain preservation during storage, grain inspection and procurement, and quality maintenance.

To implement these activities, USAID issued three Requests for Proposal (RFPs). As a result, the following contractors were identified:[22]

Activity	Contractor
Storage Management and Training, Integrated Pest Management, (Storage Development and Technology Transfer)	Food and Feed Grain Institute Kansas State University (FFGI/KSU)
Storage Infrastructure	Experience Incorporated
Vertebrate Pests	Denver Wildlife Research Center (DWRC)

IV.a.2 Storage Technology Development and Transfer

The goal of this component was to improve the capacity of GOP to effectively and efficiently manage the national food-security system. This included:

- Strengthening capabilities of the Pakistan Agricultural Research Council (PARC) and cooperating institutions to test and develop improved grain technologies appropriate to local conditions
- Organizing and implementing training programs for rapid extension of improved technologies to all levels of managerial and operational personnel in the grain handling and storage sector
- Providing training to enhance skills of researchers and personnel responsible for training programs.

IV.a.3 Vertebrate Pest Control Project

FSM was also to provide assistance to the Vertebrate Pest Control Center in Karachi to upgrade its applied research program for the control of birds and rodents in stored grain. This subcomponent worked to

- assist the provincial food departments and the Pakistan Agricultural Storage and Services Corporation (PASSCO) to strengthen vertebrate-pest control and loss assessment programs
- improve the quality of adaptive research in stored grains
- assess problems of stored grain at the farm level and provide methods to reduce it
- work to strengthen PARC laboratories in Karachi and Islamabad.

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[22] Robert, R. Nathan, Associates, Evaluation of Food Security Management Project in Pakistan, Feb. 1988. A report for USAID-Islamabad Pakistan. (Washington, D.C., Feb. 1988), P. 57.

After this project began in January 1986, MINFA requested USAID expand the subcomponent to include studies on pre-harvest problems of vertebrate pest control. Emphasis was also to be placed on developing outreach programs for public and private storage facilities.

IV.a.4 Storage Rehabilitation

Rehabilitation of existing storage facilities was to be conducted by the Storage Cell of the Food Division of MINFA in collaboration with provincial food departments. A local architectural and engineering firm was to survey facilities and develop a rehabilitation plan, including priorities and cost estimates for each province.

USAID agreed to reimburse a fixed amount per facility -- equal to 80% of the total estimated cost -- with GOP financing the remainder. The original project paper estimated approximately 750,000 metric tons of storage capacity were in need of rehabilitation. Contracts were to be awarded competitively by food departments to local construction firms, with the USAID Office of Engineering to inspect completed work before approving reimbursement to the GOP.[23] The USAID project agreement also supported GOP's commitment to increase the allocation of resources for regular repair and maintenance of the public-sector grain storage network.

IV.a.5 Project Coordination Unit

The USAID/ARD Office in Pakistan had counterpart responsibility to manage the project. The Mission's Food Security Manager was to be assisted by a project coordinator and the Project Coordination Unit. The project coordinator was also to serve as liaison between GOP and USAID to coordinate the three subcomponents of the FSM project. His duties included:

- Ensuring proper coordination among TA Teams
- Serving as resource person
- Organizing and chairing regular coordination meetings
- Developing a reporting system to keep all parties informed
- Serve as liaison to USAID offices and contractors
- Coordinating staff planning and implementation
- Developing an implementation plan and monitoring progress
- Participating in the design of training programs and workshops
- Preparing annual budgets and reports.

The FSM project coordinator was to be assisted by other Pakistani professional and support staff, with logistic support provided by USAID.

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[23] Project Paper. Pakistan Food Security Management (191-0491), Feb. 1984, USAID, (Washington D.C.), P. 57.

IV.b Situation

IV.b.1 Storage Technology Development and Transfer

To achieve the goals of this component, the Food and Feed Grains Institute (FFGI) of Kansas State University (KSU) was selected to provide technical assistance and to coordinate training activities. FFGI/KSU has provided two long-term advisors and 67 person-months of short-term consultants in-country and abroad.[24]

This technical assistance has been supported by both local staff and training and administration staff at KSU. Local support included provision of administrative staff at the Islamabad Office and Lahore Training Center, as well as local consultants for research and training activities. Long-term FFGI/KSU staff consist of a chief of party and storage advisor.

Since training was a primary target, the team established an in-country training center in Lahore. Training materials, including manuals and training aids, were then developed. Staff also organized training programs to cover subjects and to meet the needs of trainees as shown in **Table 15**. In addition, 19 staff have completed two semesters of nondegree courses in Pakistan.

A summary of overseas training including specialized shortcourses, seminars, and graduate degree programs, is presented in **Table 16**.

The KSU program far exceeds the expectation of training established in original project documents. More importantly, it provides Pakistan with a well-qualified cadre of personnel to continue development of wheat postharvest improvements in the country.

Table 17 illustrates the broad base of participants receiving in-country training, with private-sector firms attending some training sessions. Master trainees from the first phase of the program have since assisted in other training programs. Several Master Trainers have also been promoted to managerial positions where they can be more effective.

In addition to training activities, the center at Lahore has studied a number of problems of wheat handling and storage. Some published reports have been used as training materials, while others have provided valuable data to MINFA for policy decisions related to wheat handling and storage. A list of these reports is located in Annex 7.

Currently, the Training Center is conducting research on insect resistance in cooperation with the Tropical Agricultural Research Institute (TARI), fumigation programs with PASSCO and the Punjab Food Department, and research on bulk handling of wheat, including manufacture of grain equipment.

Many of these studies and publications have already made an impact on grain-storage practices and government policy. *Grain Grading, Handling, Storing and Marketing of*

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[24] Semi-annual Report December 1990, FSM/STDT/FFGI/KSU.

Cereal Grains[25] will probably become a "Technical Bible" for technicians in the grain industry. Other studies and reports on bulk handling will help answer questions on the technology and economics of this industry in Pakistan. For example, *Fair Average Quality Procurement Procedure and No Loss Policy in The Public Sector Storage*[26] has and will continue to provide information to the government to assist them in making policy decisions on wheat procurement.

Training Center staff have also participated in private-sector flour miller seminars and workshops. These meetings have provided an opportunity to show the private sector what the Training Center was doing, to allow staff to obtain feedback from the private sector, and to provide GOP officials with an opportunity to exchange views with private millers.

IV.b.2 Vertebrate Pest Control Project

The Vertebrate Pest Control Project (VPCP), implemented by DWRC is working to:

- assist provincial food departments and PASSCO to strengthen capabilities in vertebrate pest control and loss-assessment methods in grain storage
- improve the quality of adaptive research programs of stored grains
- assess problems at farm level and develop methods to reduce losses
- assist Pakistan Agricultural Research Council (PARC) to strengthen vertebrate pest-control laboratories in Karachi and Islamabad.

In early 1986, MINFA requested this project also assess pre-harvest losses due to vertebrate pest problems.

A study in public sector-storage losses was completed in 1986. The survey covered 166 storage centers belonging to provincial food departments and PASSCO. Major findings included infestations due to structural deficiencies and poor sanitation practices -- conditions that could be easily corrected. Estimated annual losses in storage due to rodents and birds was shown to be only 0.1 to 0.2%, with public health aspects of contaminated grain outweighing economic losses.

VPCP cooperated with the FFGI/KSU training program in Lahore to prepare educational materials, including booklets, brochures, slide presentations, and videos. To date, VPCP has reached 2,040 persons in a total of 2,036 person-days of training.[27] In addition, six

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[25] Ulysses A. Acasio and R. C. Maxon, Reference Manual - Grain Grading, Handling, Storing, and Marketing of Cereal Grains, June 1989, FSM/STDT/FFGI/KSU.

[26] Richard C. Maxon and Others, Impact of Fair Average Quality Procurement Procedures and No Los Policy on Public Sector Storage of Wheat, October 1989. Project Report No.3, Revised, FSM/STDT/FFGI/KSU.

[27] Joe E. Brooks, Vertebrate Pest Control Project, End of Assignment Report, Nov. 1985 - May 1990, Wildlife Biologist Consultant, FSM/VPCP/DWRC/GOP/USAID Project Unpublished Report.

persons received 260 person-days of specialized training, and one person completed a 2-year degree program at Quaid-i-Azam University.

Laboratory and pre-harvest field studies included losses due to rats, wild boar, porcupines, and birds. Cooperative studies were conducted with the National Agricultural Research Center (NARC) in Islamabad, TARI, and the University of Agriculture at Faisalabad. The University, with additional funding of $34,000 from USAID, established graduate-degree training programs, with each student's thesis on some phase of the VPCP. To date, 30 degrees have been granted, with 6 more to finish by December 1992. In addition to degree programs, USAID has provided funding of $40,000 for wild boar research. This is the first time in the Indian-Pakistan area that vertebrate research has been established within a university system.

Through VPCP cooperative work at the University at Faisalabad, staff have reached more than 1,000 farmers in the area through extension activities. Previously, farmers were afraid to go into the fields at night to manage water supplies because of the wild boar. As a result of these studies, techniques were developed to keep wild boar away, and farmers estimate they now save 21% of irrigation water.

VPCP has also worked closely with the Grain Storage Research Laboratory of TARI at Karachi University. Staff have completed intensive studies on grain fumigation and developed economical practices for use at storage centers throughout the country.

DWRC has provided the services of one full-time advisor and 14 short-term consultants on various aspects of vertebrate pest control during the project period 1985-90. The project has an incredible list of publications including manuals, handbooks, posters, video cassettes, and 30 completed theses.

IV.b.3 Storage Rehabilitation

The USAID Project Paper (February 1984) and the GOP Planning Commission Proforma-I (September 1985) envisioned a storage rehabilitation program to accommodate 750,000 metric tons. USAID had budgeted $7.546 million as their 80% share and GOP budgeted $1.88 million (Rs. 25 million @ 13.5 exchange rate) for their 20%. A Pakistani engineering firm was contracted to develop a rehabilitation plan for each province. Construction contracts were then awarded competitively by food departments to local firms.

A condition precedent in the USAID project paper delayed the GOP's start-up of this activity (this is discussed later). A local firm, ZOR Engineers, was hired to complete the initial survey in conjunction with the AID contractor, Experience Incorporated. They concluded that funds allocated by USAID and GOP would rehabilitate only 332,000 metric tons,[28] due to the severely deteriorated conditions of the stores.

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[28] Experience Inc., Operational Plan for Godown Rehabilitation including Improved Practices and Procedures for Stock Management and Repairs and Maintenance of Public Sector Grain Storage Phase II, September 1988. Report prepared for GOP, MINFA and USAID.

Further delays in project implementation resulted when PASSCO was chosen as host-country contractor. They had to re-survey storage facilities, making detailed designs and cost estimates for each structure to be rehabilitated. The resurvey and new cost estimates, along with a local rupee devaluation, estimated that up to 470,000 metric tons could be rehabilitated.

The first contract was awarded in January 1989 and construction began in late spring of the same year. In the following 2 years, 62 construction contracts were awarded. As of June 1991, AID/Engineers had earmarked $6.624 million and committed $6.541 million for the rehabilitation of 578,900 tons of storage (**Table 18**).

This falls short of the 750,000 metric tons envisioned in the original project paper, but greatly exceeds the original engineering estimate of 330,000 metric tons. This is 21% of house-type *godowns* in Pakistan used for wheat storage.

A remarkable construction achievement in just 2 years, credit is due to several individuals including the USAID/FSM project coordinator, the senior general manager (Works) PASSCO, and a large number of individual contractors.

During the first part of the FSM, GOP had been unable to meet two conditions precedent. AID project managers and their coordinator were determined to get this project moving. Working with MINFA and each provincial government, they were able to achieve the following satisfactory solutions:

- Provincial food departments and PASSCO, when procuring wheat on behalf of the Federal Government, would set aside Rs. 20 per ton for repair and maintenance costs. These would be taken from the incidental fund the food departments and PASSCO receive from GOP for each ton of wheat procured.

- A rehabilitation plan and a tripartite agreement was established between MINFA, provincial food departments, and PASSCO.

The 578,900 metric tons of storage capacity completed has shown what can be done in a relatively short period of time with badly deteriorated *godowns*. Most of the funds were spent on safety features to the storage structures including repairs to walls, columns, beams, roof, and doors. Secondly, monies were spent to restore plaster, floors, verandas, roads, compound walls, gates, and approaches. Rehabilitation has resulted in first class storage structures which, with proper maintenance, should last 15-25 years. Equally important, this work has demonstrated to provincial food departments and to the private sector the value of rehabilitation versus new construction.

Project achievements can best be summarized by comparing the logical framework objectives with actual results (**Table 19**).

Training results are summarized in **Table 20**. An important part is the additional training defined during project implementation.

IV.c Analysis

IV.c.1 Storage Technology Development and Transfer

One of the most impressive results of this component is its training programs. In total, 1,885 individuals have received 6,781 person-days of formal training at the Lahore center. This has provided the first education in modern storage techniques offered in Pakistan. Additionally, 54 individuals have completed 58.5 person-months of overseas training, in addition to three degree programs. For the first time, provincial food departments and PASSCO have staff technically trained in improved storage techniques. Private-sector flour millers have also received training in this area.

Technicians and managers now have the capability to reduce physical losses of wheat in storage and produce a better quality of wheat -- hence, better quality flour. The evaluation concluded that training funds were well spent.

Through studies undertaken by this component, new or revised storage technology has emerged. Staff have assisted PASSCO and the provincial food departments in the fumigation program at several locations. Insect resistance to fumigation materials are now being studied, which should lead to more efficient, economical fumigation. Two publications, *Integrated Past Management in Hex-Bins* and *In Bagged Grain in House Type Godowns*, are being used by PASSCO and the provincial food departments as operation guides. Several studies have been related to bulk wheat handling and storage. Reports from these studies have forced GOP and others to look carefully at investment in storage. One example is the Asian Development Bank (ADB) plan of the early 1980s to provide GOP with approximately $41.3 million to build 500,000 tons of storage. Based on results of recent studies, this project has not been implemented, nor planned for the near future.

Based on MINFA's 1987 request, FFGI/KSU completed a major study to look at converting Pakistan wheat storage and handling from bag to bulk storage. This research indicated cost would be excessive at this time and GOP decided they could not invest such large sums. Interest continues to run high in bulk handling and storage, however, this component has imported bulk-handling equipment to use with such storage. Equipment is also being tested, demonstrated, and copied by local manufacturers. Several bag-type *godowns* have been converted to bulk storage, with the conversion process increasing capacity from 1,100 tons to 1,600 tons each. This 45% increase is significant in that it quickly adds thousands of tons to total storage capacity in the country. Economic feasibility is now being studied by STDT staff.

A second study requested by GOP is on a modern grain import/export facility at Port Qasim. This briefing paper has served as valuable input to make decisions concerning the existing facilities.

Pakistan has several bulk-storage facilities where labor is used to load and unload the grain. Staff have assisted in designing and installing bulk-handling equipment now being tested at these sites. Through the training center, a number of publications on pest control, storage operation, maintenance, and inspection and *godown* management have

been published in Urdu. The center has also trained operators and managers for the new storage facilities built by the World Bank project.

A major publication by training center staff is *Impact of Fair Average Quality Procurement Procedures and No Loss Policy on Public Sector Storage of Wheat.* This has provided the government with the information needed to make policy decisions concerning the procurement and storage of wheat.

Although the STDT component has made a significant contribution to improving the technology of wheat handling and storage in Pakistan, the issue of institutionalization remains. This is a strong, ongoing program in training and research that should be continued on a long-term basis. In early 1988, PASSCO and the provincial food departments had identified more than 5,700 persons to be trained (to date, only 3,587 have received training). Staff turnover is high in these departments, and more in-service training is required. Who or what organization is to do this?

More studies and economic analyses need to be completed on bulk handling and storage. The storage cell in the MINFA needs additional trained personnel and funds to support these responsibilities. STDT staff are often called on to serve as consultants for private- and public-sector projects. Who will perform this much-needed duty in the future?

In addition, integrated pest-management studies and extension activities need to be continued. Work on wheat grades and standards by the STDT subcomponent is important to future government policies. Even though the training program has a remarkable record, this is only the beginning of modern postharvest technology in the wheat industry. To obtain full benefit of this program, similar training should be continued for some time to meet industry's needs.

IV.c.2 Vertebrate Pest Control Project

To 1,000 farmers in the Faisalabad area, the most significant contribution of the Vertebrate Pest Control Project (VPCP) is its ability to save 21% of irrigation water and eliminate farmers' fear of the wild boar.

VPCP, with additional funds from USAID, has worked closely with the Zoology Department of the University of Faisalabad. This has resulted in the completion of 25 degree programs -- with 8 more underway -- all in some phase of vertebrate pest control. This has been a very cost-effective program.

Other VPCP work in Pakistan has been done in cooperation with the Tropical Agricultural Research Institute in Karachi and National Agricultural Research Center in Islamabad. Through these organizations, pre-harvest studies have been completed to show the amount of damage vertebrate pests are doing to wheat, maize, sugarcane, and groundnuts. More importantly, as a result of these studies, ways of eliminating or controlling these pests are being established.

VPCP has made a contribution to the control of elimination of these pests through the training of 2,040 persons. VPCP has also produced considerable educational information

including brochures, technical reports, publications, training manuals, handbooks, posters, and video cassettes, which are available throughout the country.

Another important finding of the VPCP was that grain storage losses due to vertebrate pests is small; grain contamination results in more significant losses. From this, one could conclude that more emphasis should be placed on vertebrate pest in pre-harvest conditions, while postharvest studies concentrate on other types of pest management.

Even with these accomplishments, vertebrate pest-management capabilities in provincial food departments and PASSCO storage personnel remains minimal. Therefore, extension and training programs need to be continued and expanded. Presently, there are no vertebrate pest-management activities in any provincial agricultural-extension departments.

Research and extension activities at the University of Agriculture in Faisalabad, TARI in Karachi, and National Agricultural Research Center (NARC) in Islamabad need continued support. Because of their work in pre-harvest technology, priority should be given by PARC. However, the Grain Storage Research Laboratory in Karachi needs additional assistance to expand their activities in postharvest storage. This is particularly important for their fumigation work at the Training Center in Lahore.

IV.c.3 Storage Rehabilitation

Rehabilitation of storage facilities has been more complicated than it appears on the surface. First, we can look at the final results, then at the many problems and accomplishments to get the job done.

Today, a program that will rehabilitate 578,900 tons of wheat-storage capacity at a USAID and GOP combined cost of Rs. 169 million is 99% completed. This project has taken storage facilities in a deteriorated condition, (broken or cracked beams and columns, leaking roofs, doors and windows that could not be closed, plaster falling off walls, and roads with potholes) and put them into first-class storage condition. The life expectancy of these facilities, with proper repair and maintenance, is now anticipated to be 20-25 years, about the same as newly constructed facilities.

The cost of rehabilitation has been Rs. 293 per ton of storage capacity as compared to a new construction cost of Rs. 1,193-1,740 per ton for the same type facility, or approximately one-fourth the new cost. There are several ways to look at this, one is new construction for the same storage capacity would have cost Rs. 676 million, as compared to Rs. 169 million spent on rehabilitation. For the same expenditure of Rs. 169 million, only 145,000 tons of storage capacity could have been built -- compared to the lowest cost of new construction. This is a considerable saving for GOP and one should conclude funds wisely spent.

The USAID Project Paper estimated storage losses could be reduced by 3.5% through the postharvest management component. This reduction could be achieved with the rehabilitation of storage facilities, and the improved management and operation of the facilities accomplished through the STDT and VPCP components. (Neither could achieve total results without the other). Assuming a modest 3.0% reduction in physical losses, (3.0% of 578,900 tons) this would save 17,367 tons of wheat annually. Present wheat

value of Rs. 2,600 per ton represents Rs. 45 million saved annually from reduced storage losses against a capital investment of Rs. 138 million. A 3.0% reduction is realistic; a recent study concluded public-sector storage losses range from 1.9% to 3.9%.[29]

A third achievement of the storage rehabilitation component is the establishment of a tripartite agreement between MINFA, provincial food departments, and PASSCO for recurring costs of repair and maintenance. These organizations are to use Rs. 20 per ton from incidental funds paid to them by the federal government as repair and maintenance funds. It was also agreed that PASSCO would implement these funds for all agencies. This is a major accomplishment, and when implemented will greatly reduce the need for large capital to rehabilitate additional *godowns* or construct replacement facilities.

Godown rehabilitation had some sensitive issues. In many cases, it was difficult for contractors to complete the work since provincial food departments had wheat stored in them. Work had to be coordinated when *godowns* were empty and in some cases, these food departments could not move wheat for the convenience of the contractor. In other cases, department staff wanted other items such as weigh bridges, offices, and bathrooms rather than the actual *godown* repair. Food department staff did not agree with construction plans in all instances. One example was the size of doors. Staff wanted larger double doors -- for convenience of two people passing through a doorway. However, door size had been discussed and decisions made at joint meetings much earlier. Subcontractors also preferred to do new construction instead of rehabilitation, creating delays in finding good contractors. Credit should be given to PASSCO and contractor staff for getting the jobs done tactfully. Based on the success of this program, food departments can now plan additional rehabilitation work.

Two problems delayed the beginning of the storage rehabilitation project. One was the conditions precedent to the disbursement of funds which took 2 years for GOP to agree on. Policy decisions by GOP established the repair and maintenance recurring fund, as well as the tripartite agreement between MINFA, provincial food departments, and PASSCO.

The second problem was encountered when PASSCO was selected as host-country contractor. They had to, in most cases, re-survey godowns selected and complete detailed designs and cost estimates before subcontracting work. In doing this, they were able to stretch available funds further and rehabilitate more storage capacity. Once subcontracts were let, the construction work moved ahead of schedule.

A big help were the monthly and sometimes bi-monthly meetings set up in MINFA. The Dy. Secretary of Food (also head of the Storage Cell), and sometimes the Joint Secretary of Food, chaired these meetings. The meetings provided a forum for MINFA, different provincial governments, PASSCO, subcontractors, and USAID to discuss and resolve problems. The Storage Cell created for this project helped solved problems of rehabilitation construction, with contractors, provincial governments, and assisted in overall government administration.

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[29] Coulter, Jonathan, The Case for Bulk Storage and Handling of Wheat in Pakistan. ODNRI, Feb. 1991.

In reviewing the storage rehabilitation project, considerable credit is due FSM staff for their persistence and innovative ideas to move this project forward. Through its initiative, project staff were able to complete the tripartite agreement between MINFA, four provincial governments, and PASSCO for the repair and maintenance recurring cost plan. They also assisted in preparing a long-range storage rehabilitation plan. This took considerable time and patience on their part, working back and forth between the members of the agreement. The FSM project coordinator's knowledge of government and private-sector operations and his experience with the PWD and PASSCO was valuable in "getting things done".

It is encouraging to see cooperation between donor agencies, and this is a good example of such. In the early 1980s, PASSCO built 540,000 metric tons of wheat-storage capacity for $32 million as part of a World Bank project. As this was coming on-line for operation, the USAID-Postharvest Management Training Center educated operators and managers for PASSCO and the provincial food departments who were later assigned to many of the World Bank *godowns*.

Under the USAID storage project, several loose ends need to be finished. The project has assisted the government in establishing a repair and maintenance recurring-cost system. It now needs to be implemented. A follow-up is needed with assistance to the provincial governments and PASSCO to make sure the tripartite agreement is operating as planned, and to make any adjustments, if necessary. Also an analysis of other storage facilities, to determine the extend provincial governments could follow with additional rehabilitation work. In addition, a storage analysis of the country needs to be conducted, with an overall strategy for development formulated.

IV.d Impact on National Economy

The postharvest management component of FSM has several significant benefits to the national economy. The first and most dramatic is the reduction of losses of wheat in storage. As identified in the USAID Project Paper and the GOP Planning Commission Proforma-I, this reduction in wheat loss as a benefit of this project should exceed 3.0%.

Considering only 578,900 tons of storage capacity were rehabilitated, a 3.0% savings equals 17,367 tons of wheat. At local prices of Rs. 2,600 per ton, this loss reduction saves Rs. 45 million annually. Moreover, when that amount is saved, it reduces imports by 17,367 tons, and at an import value of $160 per ton is worth US$2.8 million each year.

The above savings are a result of the rehabilitation of the 578,900 tons and the STDT and VPCP components in improved storage operation and management. STDT and VPCP benefits of improved storage technology could be applied to other storage facilities in the country for further reduced losses of wheat and greater benefits.

An additional benefit of the postharvest management component is the reduction in cost per ton of investment in storage capacity. This project has shown that "deteriorated" *godowns* can be rehabilitated to a first class facility at a cost less than one-fourth that of new construction. This could mean a considerable savings to the country as it considers the need for additional storage capacity.

For example, if the country needs an additional 200,000 tons of storage capacity, rehabilitated storage (at Rs. 300/ton) would cost Rs. 60 million. On the other hand, new construction, at a minimum expense of Rs. 1,200/ton, would cost Rs. 240 million -- or an additional Rs. 180 million.

This project has also developed another way of increasing storage capacity with a minimum investment as a result of studies by the FFGI/KSU team. Many existing *godowns* can be converted to bulk storage with very little cost; this process would increase the capacity of the *godown* from 1,100 tons to 1,600 tons, a 400 ton increase. For each 100 *godowns*, this amounts to 40,000 tons of additional storage; to do this, mechanical handling equipment is required. Economic feasibility of the change is being studied by STDT staff.

Sample mechanical grain-handling equipment has been imported on this project and is being adapted to local conditions. This creates an additional opportunity for private-sector investors.

An indirect benefit is shown in human resource development. This should prove a boost to the economy. Through the postharvest management component, some 58 persons have received training abroad (through degree programs and shortcourses) and 3,925 persons have received specialized training in-country. These training programs include storage management and operation, as well as other storage-related topics.

An additional indirect benefit is improvement in the quality of flour to the consumer. As facilities have improved and modern storage techniques have been used, the quality of wheat and flour is improving.

IV.e Conclusions and Recommendations

What have we learned? How we helped?

- Deteriorated storage facilities can be rehabilitated.
- The cost of rehabilitating storage is one-fourth the cost of new construction.
- A method has been developed for financing repair and maintenance costs of storage facilities.
- To move projects forward, it helps to have innovated and persistent staff to coordinate the activities.
- With the improved physical facilities and trained operators and managers, wheat losses in storage can be reduced.
- With the establishment of a training facility and educated master trainers, more staff can be trained in improved technology of wheat handling and storage.
- Vertebrate pest losses in storage are low, while contamination from stored grain by pests is high. Postharvest losses are high in wheat, rice, and sugarcane due to damage by rats, rodents, and wild boar. Research information to control this damage is available. Extension workers need to be trained in these control measures, for these in-service programs need to be implemented for practical use in the field.

This project scores high marks on helping Pakistan. It has rehabilitated 578,900 tons of deteriorated wheat-storage capacity to a first-class condition. It has shown that existing

facilities can be rehabilitated at one-fourth the cost of new construction. The project has provided the means to reduce wheat losses in storage for both the public and private sector. For the first time in Pakistani history, the project has provided a cadre of technically trained staff to operate and manage storage facilities. The project has also provided Pakistan with master trainees who can carry on this responsibility. USAID and Pakistan should be proud of this project.

A number of recommendations can be drawn from the postharvest management component. Considerably more nondegree and in-service training is needed. Training programs should be continued and institutionalized to carry on after the FFGI/KSU activity is completed. Several institutions are possibilities and include PARC, PASSCO, provincial governments, the Storage Cell in MINFA and/or agricultural universities. Considering all related variables, it appears that PASSCO in Lahore would be the most qualified institute. Therefore, the evaluation team recommends:

1. FFGI/KSU concentrate on providing additional training and transferring this responsibility to PASSCO to carry on after FFGI/KSU team leaves.

2. FFGI/KSU continue studies and summarize results on bulk handling and storage, and on pest and quality control in storage. More information is needed on bulk handling and storage; such as -- what is the best equipment? How can *godowns* be modified? What are the best fumigants to use and how?

3. AID's former FSM project coordinator be assigned to assist GOP in starting up the repair and maintenance program in all provinces. The postharvest management component has been instrumental in getting GOP policy to provide repair and maintenance funds for recurring costs of storage structures. Provincial food departments and PASSCO are to set aside funds for this. It is now important to see this program through.

4. AID FSM project coordinator assist GOP and the provincial food departments to continue additional storage rehabilitation; these entities need to bring their other storage facilities to first-class condition. By doing so, benefits of FSM could be even greater to the departments and the country. USAID could provide the catalyst needed to assist GOP in getting this program started.

5. Storage facilities throughout Pakistan should be analyzed, with the analysis including an overall strategy for complete storage for the public and private sector. GOP should take the responsibility for this, with USAID technical assistance.

6. The Lahore Training Center operated by KSU (and assisted by PASSCO) develop a postharvest newsletter to be published regularly. Managers and operators of storage facilities need new information as it is available. As results are obtained from research and studies, it should be passed on to users.

7. Additional financial support be provided by GOP to TARI for their work with grain-pest control, and to NARC for their work in pre-harvest pest control.

V. Promotion of Agribusiness Activities

V.a Background

Private-sector expansion is one of three central policy reforms of the Agricultural Sector Support Program (ASSP). Specific goals are the elimination of unnecessary regulation and reduction of the state's role in production, processing, and distribution.[30] ASSP objectives are: (1) public-sector organizations to handle less than one-third of the total marketed volume of each major crop and input, and (2) output of state-owned plants which process or manufacture agricultural inputs and products would be no greater than at present.[31] Expected GOP policy reforms include a major streamlining of the sanction process and other controls on investment, significant reduction in tariffs on imports for agribusiness, elimination of export subsidies and subsidies on state-owned processing plants, and at least 75% privatization of procurement for all major crops.[32] Major issues to be examined include:

- import and export policies that restrict agribusiness
- the process of government approval (sanctioning) of private agribusiness projects
- government practices and regulations concerning grading, certification, and quality control
- price policies, particularly price controls and subsidization of agricultural products that affect the agribusiness sector
- the power of local authorities to tax local movement of goods, impose temporary controls on such movement, and determine prices in their jurisdictions, which may affect both profitability and risk for agribusiness firms.[33]

The Food Security Management (FSM) project's Economic Analysis Network (EAN) also identified the need for further, in-depth studies in agribusiness. The workplan for the Directorate of Agricultural Policy in the Economic Wing includes studies of marketing margins for major agricultural products between the farmgate and retail consumer. Studies are also to include potential economic benefits from the adoption of alternative transport, storage, processing, and merchandising technologies.

In January 1989, USAID contracted with RONCO Consulting Corporation to create the Analysis of Corporate Sector Constraints in Agriculture (ACSCA) project. The objective of this project is to identify constraints, capabilities, and opportunities to stimulate the growth of private-sector investment in agribusiness. The assumption underlying ACSCA

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[30] U.S. Agency for International Development, Program Assistance Approval Document, Pakistan Agricultural Sector Support Program (391-0492) (Washington, D.C., September 24, 1987), p. 5.

[31] Ibid, p. 25.

[32] Ibid, p. 26.

[33] Ibid, p. 38.

is that substantially increased private-sector investment will increase the agricultural sector's productivity and efficiency.

In late January 1989, RONCO subcontracted with AGRI-BI-CON International Limited, a Pakistani firm, to assist with the ACSCA project. In April 1989, a second subcontract was established between RONCO and Colorado State University's International Center for Agriculture and Rural Development (ICARD).

ICARD developed a linear programming model to use in economic analysis and policy formation. The Pakistan Agricultural Sector Model (PASM) provides an integrated analytical framework to assess demand, supply, and policy changes in Pakistan's food and fiber system. PASM links farming with agribusiness activities to evaluate economic, production, and marketing impacts of policy changes, and links agro-industries which supply farm inputs or process and market farm outputs. PASM can also analyze the sector-wide impact of increased capital investment, fluctuating international or domestic commodity prices, and major policy changes such as privatization or reduced tariffs.

The ACSCA project has proceeded along two lines of analysis:

1. An in-depth policy and economic assessment of the investment climate for agribusiness that resulted in the October 1990 publication of the *National Agribusiness Assessment Report*

2. Case study research, including in-depth analyses of private- and public-sector corporations in six key agro-industries:
   - Farm machinery and implements
   - Fertilizer and pesticides
   - Seed production and distribution
   - Edible oils
   - Livestock feed
   - Fruit and vegetable processing.

Selection of these agro-industries was based on USAID recommendations and a desire for an equal mix of key input and output agribusiness sectors, and comprehensive research reports were prepared for each. The December 1990 *Agribusiness Industry Case Study Report* synthesizes the main findings, conclusions, and recommendations of research reports and analyzes linkages among industries.

USAID contracted with Samuel R. Daines (SRD) Research and Development Groups, Inc., in March 1990 to train Pakistani horticulture producers and marketers in production, postharvest handling, and marketing techniques for nine selected fruit and vegetable products. These include asparagus, grapes, mangoes, melons, nectarines, peaches, plums, raspberries, and strawberries. The project's scope of work consists of two major phases: Phase I includes preparation of training materials, and Phase II is composed of in-country training activities. Prior to initiation of Phase II, SRD was to obtain long-term commitments from local collaborators.

USAID also funds short-term agribusiness consultants through the International Executive Service Corps (IESC). IESC began informal operations in Pakistan in 1984 and

completed 81 projects by 1990. IESC executives have worked in several Pakistani agro-industries including sugar mills (crushing, maintenance, production, and performance evaluation), dairies (animal feed, ice cream, marketing, and feasibility studies), farm machinery (manufacturing), juices (processing and marketing), and soybeans (financing through the Agricultural Development Bank of Pakistan).

In January 1989, USAID awarded a grant of $150,000 to IESC for a portion of its short-term consultant costs and for development of a Trade and Investment Service in Pakistan. The grant was increased by $425,000 in July 1990 to enable IESC to service the needs of small businesses. Current USAID funding levels are sufficient to support IESC projects through 1992. Of the total $575,000 USAID grant, $375,000 are ASSP program funds and $200,000 are PDIF funds.

Further macroeconomic studies and analyses of Pakistan's agribusiness sector have been conducted by the Economic Wing's Agribusiness Section (AGBU), with support from the ASSP Economic Policy Analysis project. AGBU is to provide MINFA, including the AgriBusiness Cell (ABC), with economic intelligence for the formulation, analysis, and execution of effective agribusiness policies and programs. The AGBU is also to develop a cooperative relationship with the ABC to determine which agribusiness issues to research. Effective working linkages must be developed between ABC, AGBU, PARC's Directorate of Agribusiness, and Office of the Agricultural and Livestock Marketing Advisor in Karachi. All four organizations must collaborate to define and coordinate their functions.

V.b Situation

In identifying constraints and opportunities for private-sector investment and participation in agribusiness, the ACSCA project focuses on the many enterprises directly engaged in agro-industrial, commercial, and service activities. Agribusiness operations include farm-input suppliers and commodity distributors, food processors, fiber, equipment, and packaging manufacturers, and transportation, maintenance, and storage services.

ACSCA field research was essentially completed in July 1990. The analysis assessed constraints and opportunities for private-sector investment as well as case-study research in six agro-industries. The study also included a comparative analysis of private- and public-sector companies in each agro-industry. Preparation of the *National Agribusiness Assessment Report* helped ACSCA's technical assistance team identify policy and economic incentives needed to increase private-sector participation and investment in agribusiness.

Analytical methods used in the agribusiness assessment report included qualitative and quantitative analyses of data and information. For the qualitative assessment, secondary sources of data were supplemented by information gathered in personal interviews. A series of seminars and workshops were conducted to elicit what participants perceived to be the main constraints inhibiting agribusiness investment.

For the quantitative assessment, ACSCA developed a linear-programming model to simulate the optimization of agribusiness activities. The PASM model allows examination of the relationships and linkages between farmers and consumers. The linear-programming model will facilitate simulations to:

- quantify the impact of current and proposed policies and regulatory/administrative changes
- examine constraints and opportunities for specific agro-industries
- demonstrate quantitatively the significance of linkages and interrelationships among firms in any given agro-industry.

At the time of publication of the National Assessment Report, ACSCA's project team found that although the GOP had taken certain, identifiable steps toward attracting private investment to agribusiness, it had not formulated or pursued a deliberate, overall national agribusiness-development policy. According to this report, statements from senior government officials on the importance of private-sector agro-industries were made from time-to-time. However, GOP pronouncements were not followed up with concrete policies or an integrated set of measures to put them into action. The *Agribusiness Industry Case Study Report* enabled ACSCA's technical assistance team to isolate the most important policy issues affecting private-sector investment. The study's analysis of the six subsectors demonstrated interdependence in the business relationships of the agribusiness sector. This helped to define problems and limitations which arise when policy formation is based on narrow subsector issues or specific commodity objectives.

The first research reports to be undertaken, the *Fertilizer and Pesticides Research Report* and *Fruit and Vegetable Processing Research Report*, tested the methodology developed to conduct research analyses. This included providing data to identify specific agricultural- and investment-policy constraints, preparing sound financial, economic, and human-resource utilization profiles, and presenting specific policy and agribusiness promotion recommendations.

The final draft of the *Farm Machinery and Implements Research Report* was submitted to USAID in April 1990. Primary field research and data collection were conducted throughout Pakistan. The final draft of the *Edible Oils Research Report* was submitted to USAID in November 1990. Interviews were held with both public- and private-sector individuals from 18 companies to collect trade, price, and technical data. The final draft of the *Livestock Feed Research Report* was completed in 1990.

Initial field research for the *Seed Production and Distribution Research Report* was concluded in November 1989. However, further data collection continued into the first quarter of 1990. Some 16 companies, government agencies, and institutions participated in the research work providing data for this study.

During the fourth quarter of 1989, assembly of crucial financial data on three fertilizer companies operating in Pakistan enabled the ACSCA project team to complete a comparative financial analysis of this industry for the *Fertilizer and Pesticides Research Report*. Twenty companies and financial institutions were interviewed, providing essential data used in report preparation.

Conclusions derived from work on the six research reports were helpful in the preparation of the September 1989 preliminary draft of the *National Agribusiness Assessment Report*. The report, distributed by USAID to key public and private representatives, generated considerable interest in the ACSCA project. The team subsequently narrowed the range of policy issues to be analyzed.

ACSCA also included a provision for approximately 10 workshops and seminars to be held for public- and private-sector firms. Participants were expected to stimulate debate on policy issues and identify constraints to private-sector investment. It was hoped that solutions could be identified by participants having first-hand knowledge of problems. Their views and recommendations would then help the ACSCA project complete a realistic analysis of constraints and formulate practical policy recommendations for stimulating private-sector investment. A list of possible constraints was distributed to participants to help them identify the most limiting factors. Participants were also asked to identify constraints not cited in the list. These included:

- Government investment or industrial policy
- Government price policy
- The process of sanctions for new businesses
- National and provincial taxes (income, excise, sales, surcharges)
- Trade policy (import and export regulations)
- Government role and practice in consumer protection
- Conflict between public and private sectors in agribusiness
- Policy regarding intellectual property (patents and trademarks)
- Availability of infrastructure (water, gas, roads, electricity, communications facilities)
- Government banking regulations and credit policy
- Banking industry operations and practices
- Inadequate capital markets
- Corporate business operations
- Need for specific kinds of new regulations.

In the first year of the project, ACSCA held seminars in Karachi, Lahore, Peshawar, Quetta, and Multan. An April 1990 seminar in Islamabad presented ACSCA's draft *National Agribusiness Assessment Report* for discussion and feedback. This helped the project team revise and sharpen the report's findings and conclusions. Among the conclusions and recommendations endorsed by seminar participants was the call for a national agribusiness development policy. This would aim at developing a strong and dynamic agribusiness sector. It was agreed that the formulation of this policy be the responsibility of MINFA, and that a special cell be established to undertake this in close coordination with other ministries.

In August 1990, a seminar was held in Islamabad to present the final draft report. The need for institutional support for private-sector agribusiness development was discussed, and MINFA's July 1990 decision to create the ABC was roundly lauded.

Seminars on the quantitative analysis component of ACSCA were held in Islamabad in June 1990 and June 1991. The objective of these seminars was to publicize the Pakistan Agricultural Sector Model (PASM) being used in quantitative analysis.

A 3-day workshop was held in October 1990 to discuss results of the six research reports and the *Agribusiness Industry Case Study Report*. Another 3-day symposium was held in December 1990 for open discussion of the draft *National Agribusiness Action Plan*.

USAID extended the RONCO/ACSCA project through 1991 to continue implementation of ACSCA's *National Agribusiness Action Plan* in collaboration with the ABC. This plan outlined step-by-step procedures to implement the recommendations from the *National Agribusiness Assessment Report* and *Agribusiness Industry Case Study Report.* The plan documents major agro-industry opportunities, economic incentives, institutional support, and resources needed to increase private-sector investment.

The objective of the USAID contract with SRD is to train Pakistani horticultural growers and marketers in production, postharvest handling, and marketing technologies for nine selected vegetable and fruit products. Local horticultural producer/marketing associations were identified as likely institutions with which collaborative training could be conducted. These institutions will receive technical assistance and training equipment, enabling them to sustain the training and training material preparation after completion of the SRD project. SRD has created a Market Analysis Computer System (MACS) database system to provide exporters with up-to-date weekly information on supply and demand, wholesale prices, and "bottom-line" weekly profitability. This will show Pakistan's comparative position with 10 competing exporter countries.

MACS data will be disseminated to potential horticultural exporters during Phase II training programs scheduled for July and August 1991. SRD monitors daily/weekly/monthly prices for approximately 100 horticultural products in 108 major wholesale markets worldwide, and follows costs of production in 32 major horticultural exporting countries. SRD's home-office staff is then provided with the necessary cost and price data to analyze competitive profitability. Since SRD's Pakistan project relies on short-term technical assistance, SRD employs a locally based individual to feed current data into the MACS database.

SRD has established three packinghouses to harvest, grade, and box horticultural products. These include a mango packinghouse in Multan, asparagus packinghouse in Swabi, and strawberry packinghouse in Mardan. Each packinghouse has a Pakistani collaborator and farmers' association involved in its operations. A portion of the operating costs are paid by the collaborator and farmers' association. Costs associated with technical assistance and training are funded by USAID. In addition, the Swabi packinghouse has cold-storage facilities, grading tables, and hydro-coolers supplied by USAID.

In 1991, USAID contracted with a Pakistani firm, Management and Financial Applications Limited, to evaluate the IESC's operations in Pakistan. IESC has developed three mechanisms for its Trade and Investment Service (TIS):

- The TIS Country Investment Program whereby a team of IESC executives work for 2 to 3 years to develop a strategy program for a particular industry. The major objective here is to promote links between U.S. and Pakistan firms through mechanisms such as sales agreements and licensing arrangements.

- Under the American Business Linkage Enterprise (ABLE) program, clients are provided with research studies in such areas as new-product development, equipment sourcing, joint-venture partner searches, and export-marketing research.

- Under USVE Searches (USVEs), a volunteer executive works in his own country on behalf of the client. The executive may be asked to train enterprise staff or to conduct research on behalf of the client.

According to the evaluation, services available under TIS have not been widely used in Pakistan. Only two ABLE projects had been completed. Only one client has requested USVE services.

V.c Analysis

V.c.1 Agribusiness Research and Analysis

Agribusiness development is the major research and action focus of the ACSCA project. In addition to identifying and recommending solutions to constraints, ACSCA has successfully articulated the economic and business environment needed to attract private-sector agribusiness investment and participation. These results formed the basis for specific policy and action recommendations clearly outlined in the *National Agribusiness Action Plan*, a major end-product of the ACSCA project.

The Action Plan documents agro-industry opportunities and economic incentives, institutional support and resource mobilization needed to increase private-sector investment in the agro-industry sector. The plan outlines step-by-step procedures required to implement the recommendations stemming from ACSCA project analysis. This research is considered by the evaluation team to be a useful basis for establishing government policy and private-investment decisions.

The extension of the ACSCA project to December 1991 will focus on implementing the Agribusiness Action Plan in collaboration with the ABC. The ACSCA workplan shifts from an emphasis on research and analysis to an emphasis on action and support for private sector agribusiness initiatives. The following actions are planned for the remainder of project life. ACSCA and ABC will

- codify, publish, and disseminate data and information assembled to foster policy formation and government action favorable to agro-industry development. ABC will continue economic analysis within agro-industry subsectors and promote private-sector investment in an increasingly deregulated market environment. ABC will prepare an Agribusiness Investment Policy, Procedures and Administrative Practices Issues Paper and a *Review of Agribusiness in Pakistan.*

- prepare and disseminate agro-industry investment concept papers. These will target agribusiness opportunities and the formation of venture-capital institutions committed to agro-industry financing. Investment concept papers will focus on domestic and export market development, joint-venture formation, technology transfer, venture-capital mobilization, manufacturing of agricultural inputs, agro-commodity transformation, and commercial agribusiness activities and services.

- prepare technical, procedural, and financial-investment guidelines and manuals to aid policy formation and implementation and improve the investment climate.

- apply the linear programming model to evaluate the impact of proposed structural changes resulting from market deregulation. The PASM Model will be transferred to the Economic Wing to strengthen its economic policy analysis capability.

Based on previous research, these actions should achieve project objectives of increasing agribusiness investment. Useful working linkages with the Economic Wing will be established.

The most recent national agricultural policy includes a section on agribusiness and the private sector. Policy goals, objectives, and strategies which reflect ACSCA findings and recommendations are highlighted. MINFA has requested ACSCA assistance in preparing an explicit agro-industry policy to stimulate agribusiness investment. This will become a part of national agricultural policy. The Evaluation Team considered this to be a solid indication of ACSCA impact on policy reform.

ACSCA's agro-industry research and analysis influenced GOP policy reform and contributed to the drafting of specific policy benchmarks. ACSCA's in-depth analyses of six agro-industry subsectors and its cogent assessment of the investment climate for agribusiness in Pakistan give ACSCA the insight needed to identify and target specific constraints in the agribusiness sector. GOP's appreciation of ACSCA has evolved from an initial skepticism to a desire for continued analysis from the project.

V.c.2 Benchmarks

Benchmarks negotiated between USAID and GOP have successfully contributed to policy reform that has removed key constraints to agricultural expansion. The GOP values research and policy analysis upon which benchmarks are based, and desires their continuation even though sector-support grants will no longer be available.

ACSCA's analysis of agro-industry has made a valuable contribution to previous benchmarks. Specific examples follow:

Reduction of Fertilizer Subsidies. Subsidies on fertilizers have been removed or reduced. This policy change has resulted in budgetary savings and increased opportunity for the private sector. Private-sector allocation for distribution of imported fertilizer has been increased from 34% to 60%. The existing system of provincial quotas limits private-sector distribution of imported fertilizer to about 60%. However, quotas are likely to be eliminated this year when the subsidy on phosphoric fertilizer is reduced to zero. Distribution of domestically produced fertilizer has never been restricted.

Privatization of Fertilizer Plants. In a major policy shift, GOP announced it will privatize at least five public sector fertilizer plants. These comprise more than 23% of the public-sector's capacity. Private-sector firms are proceeding with expansion plans to replace government production. Once all new capacity is on line, the private sector share of total capacity will increase to 29% from 23%. If all proposed disinvestment occurs as planned, private-sector share would rise to 41%.

Reduction of Export Controls. After benchmark discussions and studies, the GOP loosened export restrictions on some agricultural commodities. The following can now be

exported: poultry (live or dressed), 50% of commercial beef and mutton production, oil cakes, and 50% of UHT milk production and some other milk products.

Establishment of an AgriBusiness Cell. The GOP established the ABC within MINFA in July 1990 to facilitate development of the agribusiness sector. Moreover, a Planning Commission Proforma-I is expected to be approved shortly for the ABC. Although this is not needed to establish or operate a cell within a ministry, it will legitimize the ABC across ministries as a matter of overall government policy, allowing ABC to function as a recognized entity in the government at large. Most importantly, the Planning Commission Proforma-I allows ABC to implement its own projects and programs without having to seek approval from many different ministries, as long as the ABC can raise the funds it requires from either the GOP, private sector, or foreign sources.

Privatization of Edible Oils Manufacture. GOP actions have superseded the benchmark. An ordinance has been promulgated that facilitates the privatization of the Ghee Corporation of Pakistan (GCP) plants. The GOP has already put nine of its 22 GCP plants up for sale. In the fiscal year beginning July 1, 1991, GOP will put at least seven of its remaining GCP plants up for sale. The reduction in state-owned edible oil processing capacity to less than 40% of the total has been achieved through growth of private-sector processors. In 1988/89, the licensing requirement for edible oil/vegetable ghee production based on local oilseeds was eliminated.

Development of Policies for Agricultural Seeds Production. New seed laws were drafted with USAID assistance. GOP is revising and tightening the seed law to better protect proprietary rights of breeders/developers for improved varieties of seeds. In addition, a truth-in-labeling seed law has been enacted. Since December 1990, anyone can invest in a seed company without formal, governmental approval. The government has also created "tax holiday" incentives (eight-year holidays for income tax, import duties, and excise and sales taxes) to attract private investment in seed companies servicing rural areas.

V.c.3 Export Promotion

The SRD project successfully demonstrated the feasibility of exporting high-value horticultural products with the shipment of two 1.5 ton samples of asparagus to London in March 1991.

V.d Impact on National Economy

The efforts of an Economic Area Network team were instrumental in introducing the concept of agribusiness.[34] It is now common to think of income derived from linkages with farm input and product markets, as well as the farm sector itself. This concept has been institutionalized with the creation of the ABC in MINFA and is being strengthened through the efforts of the ACSCA project.

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[34] Mubarik Ali, Forest Walters and Rao Shafique-ur-Rehman, Contributions and Interlinkages of the Food and Fiber System in Pakistan's Economy, EAN Special Report No-12 (Islamabad, July 1989).

The agribusiness component has made a valuable contribution to policy reform flowing from agreed benchmarks. Much of the research underlying these policy changes was completed by this activity. The implementation of the *National Agribusiness Action Plan* will continue policy reform leading to a larger role for the private sector. Anticipated impacts include:

- sustained increase in the agriculture sector's contribution to Gross Domestic Product and foreign exchange earnings
- major medium-term increase in non-tax income and sustained growth of revenue for the GOP
- significant short- and medium-term increase in private-sector investment in agribusiness
- increased input supply, marketing, and credit services to farmers
- increased agribusiness diversification, production, and competition
- improved quality and selection of products flowing from agribusiness industries to local and foreign markets
- increase in incomes of farmers and others connected with agriculturally related industries
- increase in employment.

V.e Conclusions and Recommendations

Under the ACSCA project there has been a well-conceived effort to promote private-sector investment. The project successfully highlights the integrated framework of agribusiness activity and the importance of private-sector investment in Pakistan's agribusiness development. ACSCA has gained GOP support for a greater private-sector role in the policy-making process. Establishment of the ABC within MINFA will help stimulate and promote private-sector investment. ACSCA presents sharply focused recommendations to improve the climate for private sector investment. Its *National Agribusiness Action Plan* clearly outlines actions necessary to implement those recommendations. SRD's horticultural export project demonstrates the feasibility of exporting high-value crops.

To further achieve ASSP end-of-project agribusiness objectives, it is recommended that

- USAID continue technical-assistance support to the ABC to capitalize on current GOP interest in the private sector and to bridge this project and a proposed multinational donor effort.

- ABC, AGBU, PARC's Directorate of Agribusiness, and the Office of the Agricultural and Livestock Marketing Advisor work closely together to define and coordinate their functions.

- MINFA place a priority on employing ABC officers who have working experience in business investment or formal education in business management or economics.

- MINFA seek donor assistance to train ABC executive officers in business investment and management.

- GOP immediately implement the four priority categories in the *National Agribusiness Action Plan*. These four categories would include: (1) defining, approving, and adopting a national agribusiness development policy, (2) institutionalizing the ABC, (3) formulating a national privatization policy, and 4) targeting investment in and development of specific agribusiness industries.

- ACSCA project immediately begin to prepare an Agribusiness Investment and Management Services Company (AIMS) Investment Concept Paper and conduct a seminar to present the AIMS Concept Paper to key private sector, GOP, and donor agency representatives.

- ABC distribute a quarterly publication similar to EPA's former *Econogram*. The publication will increase awareness of agribusiness-related policy issues to gain support for policies which attract private sector investment.

- MINFA establish agribusiness policy benchmarks even in the absence of ASSP resource transfers. The ABC, AGBU, PARC Directorate of Agribusiness, and the Office of the Agricultural and Livestock Marketing Advisor will provide analysis.

VI. Conclusions and Recommendations

The Food Security Management (FSM) project was designed to improve the analytical and policy formulation framework, managerial capabilities, and physical capacity of GOP to manage the national food-security system. The Agricultural Sector Support Program (ASSP) was designed to provide balance-of-payments support and remove key constraints to increased economic growth in the agricultural sector through policy reform and expanded private-sector investment and participation. These efforts are consistent with the AID Country Development Strategy Statement and GOP economic-development goals.

The assessment of the evaluation team is that FSM has done well overall, with most project objectives being achieved by the end of ASSP. Major goals already attained are policy reforms, creation of an Economic Wing for Policy Analysis, and reductions in wheat-storage losses. Objectives yet to be realized include improved national estimates for major crops, a strengthened economic-analysis capacity, and implementation of a private-sector action program.

VI.a Conclusions

VI.a.1 Project/Program Components

The Economic Policy Analysts (EPA) component established the Economic Wing, provided training and equipment to improve analytical capabilities, produced economic analysis reports, and established policy benchmarks under APAP II. It also produced special economic studies under IFPRI which have been influential in GOP policy reform. One IFPRI study, together with benchmarks, led to a GOP decision to eliminate the ration-shop system for wheat. Other studies and benchmarks have been valuable in bringing about specific policy reforms to reduce subsidy levels, increase foreign exchange balances, and reduce the need for additional borrowing to construct grain storage.

Some deficiencies in the EPA component remain. The Economic Wing does not yet have a consistent record of in-depth, analytical inputs into the decision-making process. Additional effort is needed to improve research priorities and make the work program more effective. MINFA economic units need to work cooperatively in a Ministry-wide effort to provide analytical economic analyses. The economic analysis network is a useful and viable concept to improve the agricultural policy-making process, but it has been weakened because USAID funds for some activities ended with FSM and have not been replaced by GOP resources.

The Agricultural Data Collection (ADC) component has created a greater awareness of the need to improve the quality of agricultural statistics. ADC has furnished computers, trained a nucleus of people to execute the methodology, and has increased coordination between federal and provincial governments. ADC staff demonstrated that the area frame sampling (AFS) methodology can deliver reliable agricultural statistics for major crops in a timely and cost effective manner. Survey operations for AFS are estimated to cost one-third less than for the village master sampling (VMS). Moreover, AFS requires less manpower than VMS, meaning that trained staff can be reassigned to other statistical

activities. To date, 75% of all topographical maps are stratified and digitized, sufficient to test AFS methodology at the national level.

ADC has experienced delays in moving from the pilot phase of AFS to producing usable national-level crop estimates. There have also been delays in developing a methodology for minor crops and in establishing the point-sampling technique. ADC's training budget was not fully utilized due to a shortage of qualified candidates and/or a lack of English-language proficiency.

The postharvest management component rehabilitated 578,900 metric tons of storage capacity, reducing investment needed in new storage. Storage rehabilitation and training in storage maintenance reduced national wheat storage losses by 3% annually. This component's storage-rehabilitation program demonstrated that deteriorated *godowns* can be renovated to the level of first-class facilities at only 25% the cost of newly constructed *godowns*. MINFA, PASSCO, and the provincial food departments now have an agreement to fund storage repair and maintenance.

Implementation of the postharvest management storage-rehabilitation project was delayed for 2 years due to unmet conditions precedent. The FSM project coordinator worked with provincial government officials, MINFA, and PASSCO to satisfy these conditions so the rehabilitation project could begin.

This component also trained 3,587 individuals, with most completing 1- to 2-week shortcourses in Pakistan. Fifty-eight persons received training abroad, and three completed graduate-degree programs. Thirty-six other individuals were enrolled in degree programs at the University of Faisalabad. Total persons trained at the Lahore Training Center includes 1,885 storage operators and managers who received instruction in modern storage technology. The Vertebrate Pest Control Project (VPCP) trained 2,040 individuals in improved pest control.

In addition, the postharvest management component established a Training Center in Lahore which has been in operation for 3 years. However, the project has not succeeded in institutionalizing the Center to conduct future training.

There is much interest in converting from bag to bulk wheat storage. It is estimated that the conversion of 50,000 metric tons from bag to bulk storage will result in a one-time savings of Rs. 75 million through expanded capacity. Typical *godown* storage capacity is 1,100 metric tons. Converted to bulk storage, a *godown* can handle 1,600 metric tons, or a 45% increase in storage capacity. Manufacture of bulk handling and storage equipment also provides an opportunity for private sector investment.

Under ASSP, there has been a well-conceived effort to highlight the integrated framework of agribusiness activity and promote private-sector investment and participation in agribusiness. The program is successful in gaining GOP recognition and support for a greater private-sector role in the policy-making process. Establishment of the AgriBusiness Cell (ABC) within MINFA, and use of ACSCA's in-depth agro-industry research studies will help stimulate private-sector investment. There is a need to develop effective working linkages between the ABC, AGBU, PARC Directorate of Agribusiness, and Office of the Agricultural and Livestock Marketing Advisor in Karachi. ASSP's

horticultural agribusiness-development project has demonstrated the feasibility of exporting these high-value crops.

VI.a.2 Impact on the National Economy

FSM has provided direct benefits to Pakistan by contributing to policy reforms which translate into budget savings, reduced foreign exchange expenditures, and elimination of some borrowing for grain storage. The evaluation team conservatively estimated a total budget savings per year of Rs. 3,863 million in subsidy reductions and savings in wheat storage (see **Table 21**). An additional one-time saving of Rs. 986 million in public-sector borrowing for additional wheat storage resulted from the project. A potential increase in quality of crop reporting estimates of Rs. 257 million in 1991 will be derived from the project. This information will be used by policy-makers to make decisions on wheat imports and storage quantities needed to ensure food security.

Storage rehabilitation has produced an annual benefit of Rs. 45 million. The introduction of scientific handling and storage of wheat has resulted in saving one million tons per year, valued at Rs. 26 million. In the future, some bag storage will be converted to bulk storage; this will result in an additional saving of Rs. 75 million due to increased capacity of existing facilities.

Preliminary results of the AFS methodology demonstrate that it produces timely, inexpensive agricultural statistics. In 1991, use of AFS indicated that yields are 12.47 kg/ha higher than shown through the VMS method. This results in a yield benefit of Rs. 257 million annually.

There are also long-term benefits that are not quantifiable. FSM has established institutions such as the Economic Wing, ABC, and Training Center. These institutions will help formulate and implement policies leading to agricultural development. Trained staff has been a major output that will provide continued benefits to the nation.

VI.a.3 Project Commodity Procurement

The Evaluation Team reviewed *The Comprehensive Pipeline Report (6/19/91)* and *The Procurement Status Report, Commodity Tracking System (6/6/91)* supplied by the USAID (Summaries in Annex 3 and 4). The team also reviewed the May 1989 ORIG Audit as well as the response of the USAID Mission.

Team members found it difficult to track complete records of commodities purchased. For example, several PIOCs refer only to "KSU bulk handling equipment"; more detail is needed. Annex 3 shows PIOCs for the FSM project without a breakdown for subcomponents such as Economic Area Network, ADC, or Storage Technology Development and Transfer (STDT). Accounts also show joint expenditures for small-value items, computers, household furniture, and office equipment. It is, therefore, difficult to determine what has been charged to each subcomponent. The evaluation team recommends a more detailed accounting/tracking system for commodities be established and maintained.

VI.a.4 Project and Program Management

USAID analysis of the GOP economic situation and its decision to support the agricultural sector led to the design and implementation of FSM and the umbrella follow-on ASSP. USAID sought to strengthen the Economic Policy Analysis organization by innovatively seeking to combine private- and public-sector institutions.

USAID project staff worked closely with provincial government officials, MINFA, and PASSCO to satisfy conditions precedent for project implementation. They also assisted in developing a tripartite agreement for repair and maintenance work.

USAID should be credited for having effectively highlighted the important role of the private sector in Pakistan's future agribusiness development. Establishment of the ABC within MINFA will help stimulate and promote private-sector investment and participation in agribusiness. This should lead to greater productivity within the agricultural sector.

The project has benefitted from an exceptional cadre of technical-assistance advisors. The majority of the large group that assisted in all three components were technically qualified, highly motivated, and personally compatible with counterpart staff. Those who did not measure up to these standards were replaced by AID managers.

VI.a.5 Institutions

Delays in FSM implementation prevented institutionalization of the Economic Wing. Under ASSP, strengthening and sustaining the Wing is a major objective. During FSM, ADC was able to link the efforts of the Crop Reporting Service and the ADC in the collection of raw agricultural data.

Under the postharvest management component, VPCP assisted in the development of vertebrate pest-management programs at Tari (University of Karachi) and at NARC. The KSU project, regardless of its success in training programs, has been unable to sustain this training beyond the life-of-project. A major recommendation is that KSU concentrate on this factor during ASSP.

Under ASSP, analysis of private-sector constraints in agriculture project has assisted in the creation of the ABC within MINFA. ACSCA recommends the establishment of an Agribusiness Development Board within MINFA to coordinate the efforts of MINFA, the Ministries of Industry, Commerce, and Finance, the provincial governments, and the private sector. There is a need to develop working linkages between the ABC, AGBU, PARC Directorate of Agribusiness, and the Office of the Agricultural and Livestock Marketing Advisor in Karachi.

VI.b Lessons Learned

Projects focused on policy change generally take longer to mature and achieve results. A slow start-up for such projects is not uncommon, with major adjustments often needed. Project design should permit flexibility to adjust during implementation. A host-country

manager who has sufficient respect and knowledge of institutions, people, and customs to communicate constraints and needs is necessary for policy reform.

Reliable, timely data is an essential for improved policy decision-making. Yet, it is one of the more difficult objectives for host governments to fund on a permanent basis.

Successful economic- and policy-analysis units must establish effective vertical linkages to coordinate with policy-makers. It is also necessary to establish horizontal working relationships with complementary economic and technical organizations.

When designing projects, consideration should be given to continued training. Some training efforts will produce expected results in the form of a fixed number of individuals with higher qualifications; others require an ongoing capacity due to high turnover and new technology.

The success of the grain-storage component demonstrated the feasibility of rehabilitating existing storage facilities rather than constructing new ones.

VI.c Purpose-level Indicators

Systematic monitoring of purpose-level indicators should improve project and program management. Purpose-level monitoring essentially monitors the issue as to what a project is really trying to accomplish. Indicators should be selected which track progress towards that purpose and how well it is performing. Suggested indicators for ASSP could include indicators to (1) assure that achievement of a policy benchmark remains in force, (2) assure private-sector participation in the government policy-making process (i.e., a requirement that policy proposals be openly debated or discussed -- that there be some sort of public hearing or forum to assure private sector input into the policy-making process), and (3) measure the strength and effectiveness of working linkages and coordination between entities similarly involved in the policy-making process.

VI.d Recommendations

The Winrock/DAC evaluation team recommends that:

- USAID continue technical assistance support to the ABC to capitalize on current GOP interest in the private sector and to serve as a bridge between this project and a proposed multinational donor effort.

- Working linkages be developed between the ABC, AGBU, PARC Directorate of Agribusiness, and Office of the Agricultural and Livestock Marketing Advisor in Karachi. These entities should work closely together to better define and coordinate their respective functions, and should coordinate their annual workplans to achieve a higher level of cooperation and cross-fertilization.

- An AID/GOP-negotiated benchmark provide for a minimum of four higher government grades to attract and retain qualified staff in the Economic Wing.

- MINFA create a new Board to link and coordinate the work of its economic units. This body would be chaired by the Secretary of MINFA, and would include representatives of provincial governments, research institutes/universities, and Ministry economic units.

- The technical-assistance firm contracted for grain-storage management ensure institutionalization of a continuing capacity to train operators and managers of storage facilities.

- AID project managers ensure the present delivery schedule of usable national crop forecasts for major crops.

Table 1. FSM funding by expense category and status (as of 6/19/91).

Item	Obligated Budget (US$000)	Committed	Disbursed
Technical Assistance	12,412	12,408	12,403
Training	4,351	4,313	4,313
Commodities	4,441	4,256	4,248
Other Costs	5,683	5,418	5,385
Economic Studies	1,009	909	908
Storage Rehabilitation	6,595	6,595	6,579
Evaluations	188	156	151
Total	34,500	34,044	33,987

Source: USAID, Comprehensive Pipeline Report, 3/31/91.

Table 2. ASSP funding by expense category and status (as of 3/31/91).

Item	Initial	Obligated Budget (US$000)	Committed	Disbursed
Technical Assistance	13,094	13,980	7,700	2,206
Training	26,665	28,312	18,668	4,177
Contingency	11,150	--	--	--
Other	9,091	3,985	1,346	636
Subtotal	60,000	46,277	27,714	7,019
Commodities	270,000	84,723	83,529	68,050
Sector Support	270,000	80,000	75,000	75,000
Total	600,000	211,000	186,243	150,069

Source: USAID, PAAD-ASSP (391-0492), Sept 24, 1987 and USAID/Pakistan Comprehensive Pipeline Report, 3/31/91.

Table 3. Planned EPA project objectives and achievements.

Planned Output Indicators*	Achievements**
1. An agreed mandate	Established Economic Wing in July, 1990
2. An established EAN group	Established linkages with 449 individuals in 22 institutions (1989)
3. Training (minimum of 239 persons)	14 persons, long term 30 persons, short term 15 workshops, 249 persons 16 seminars, 403 persons
4. Ongoing policy analysis	
research agenda	Inadequate coordination to establish priorities
staffing	Wing has 36 professional staff
access to decision-makers	excellent
equipment	41 computers distributed plus 15 on order
5. Publications (minimum of two policy analysis)	Produced 26 major publications, 21 Econograms, 1 style manual, 10 economic expert brochures, and a number of Special Reports/Option Papers

Sources: * USAID, Project Paper: Pakistan Food Security Management, Annex E, February, 1984.
**EAN Project documents, PC-1 Form, various reports and Evaluation Team interviews.

Table 4. Reports originating from the FSM special studies subcomponent and their policy impacts, 1986-1991.

Report Title		Resulting Policy Change
1.	The Wheat Economy of Pakistan: Setting and Prospects, 1987	Basis of entire projections of the National Agri. Comm.'s Agri. Strategy to 2000
2.	Household Food Security in Pakistan: The Ration Shop System, 1988	Led to abolition of the ration shop system
3.	Demand for Public Storage of Wheat in Pakistan, 1989	Basis of dialogue between GOP and ADB not to build more storage
4.	The Source, Structure and Utilization Patterns of Rural Credit in Pakistan, 1989	Cited as evidence for not reverting to zero markup credit and to imposition of 7% markup per crop season
5.	Effects of Exchange Rate and Trade Policies on Agricultural Incentives, Output, Trade and Farm Income in Pakistan, 1989	Not visible yet but provides estimates for current policy debate on agricultural taxation
6.	Poverty, Household Food Security and Nutrition in Rural Pakistan, 1991	Confirmed need for policies broader than agriculture 1991
7.	Inter Temporal and Regional Aspects of Poverty in Pakistan, 1991	Too early to evaluate
8.	Sources of Income Inequality in Rural Pakistan, 1991	Too early to evaluate

Source: Executive Summary of Food Security Management Principal Results, 1986-1991, Unpublished Paper and Comments of Dr. Sohail J. Malik, Chief of Party, IFPRI.

Table 5. Progress on area frame sampling construction as of June 30, 1991.

Province	Number of SPOT Scenes and Topographic Maps						Topos Stratified Digitized		To be completed	
	Total		Received		Balance					
	SPOT	Topos	SPOT	Topos	SPOT	Topos	No.	%	No.	%
Baluchistan	157	592	150	561	7	31**	592	100	0	0
Punjab	104	365	85	362	19	3**	241	66	125	39
Sindh	62	248	43	246	19	2**	165	66	83	39
NWFP	57	223*	33	198	24	25**	78	34	148	66
Pakistan	380	1428	311	1367	69	61**	1076	75	356	25

* Includes 48 Topo Maps of Federally Administered Tribal Areas (FATA).
** Restricted Topo Maps not released by Survey of Pakistan
Source: ADC Seventh Year Work Plan, July 1991 - June 1992, Prepared by ADC Cell/FBS, ADC Project Staff, Peshawar, June, 1991, P.4.

Table 6. Experimental plot size by type of crop and method of sowing.

Crop	Method of sowing	Plot size
Wheat	Broadcast	21.6" square
	Lines	21.6" x 3 lines
Cotton	Broadcast	3 x 1 meter
	Lines	3 meter x 2 lines
Rice	Broadcast	21.6" square
	Lines	21.6" x 3 lines
Maize	Broadcast	7 x 1 meter
	Lines	7 x 2 lines

Table 7. Illustrative annual area sampling frame data collected/Pakistan data collection cycle, 1988.

Date of Survey	Data Collected	Date of Publication
Dec 15-June 10	Winter (Rabi) crops, area planted Summer (Kharif) crops final harvest information area harvested, production, method of harvesting.	Feb. 1 Feb. 10
March 15-April 10	Winter crops, final area planted, fertilizers and pesticides used, source of irrigation water, production forecast.	May 1
March 15-April 10	Summer crops, intentions to plant	May 10
June 15-June 10	Summer crops-area planted winter crops area harvested production, method of harvesting.	June 25
Sept 15-Oct 10	Summer crops area harvested fertilizers and pesticides used, source of irrigation water, production forecast. Winter crops intentions to plant	 Nov. 10

Sources: T. J. Byram, Food Security Management Project, Agricultural Data Collection Component, End of Tour Report July 1985 - August 1988, USDA/NASS August 1988, p-6 and Government of Pakistan, Statistics Division, PC-I Form "A" revised Annexure -V, pp. 1-2.

Table 8. Sampling errors for rice, cotton, and wheat acreage, 1989-91.

Crop	Year	Punjab 4 Districts	Sindh 3 Districts	Pakistan 7 Districts
Rice	1989	5.6	7.7	4.6
	1990	5.6	7.9	4.7
Cotton	1989	4.9	8.6	4.3
	1990	5.2	8.3	4.5
Wheat	1989	2.3	5.1	2.1
	1990	2.6	4.6	2.3
	1991	2.6	4.8	2.3

Source: Ninth Meeting of ADC's Technical Committee, Working Paper on Agenda Item II, Review of Results of Surveys/Studies, Peshawar, June, 1991, p.1.

Table 9. Target dates for first surveys, survey activities, and estimates at the entire province level, June 1991.

Province	Training of enumerators and location of segments completed	First survey conducted for entire Province	First survey data edited and entered at Province level	First estimates available
Baluchistan	December 1991	January 1992	February 1992	Early March 199
Punjab	December 1992	January 1993	February 1993	Early March 199
Sindh	December 1992	January 1993	February 1993	Early March 199
NWFP	December 1992	January 1993	February 1993	Early March 199

Source: ADC Seventh Year Work Plan, July 1991-June 1992 prepared by ADC Cell/FBS and AD Project Staff, Peshawar, June 1991, p. 8.

Table 10. Validation study results -- area frame sampling (AFS) vs village master sampling (VMS).

	Yield (kg/hectare)	Sampling Error (%)	Difference %
Wheat Validation	2,336	5.46	-10.15
AFS	2,600	2.7	Base
VMS	2,064	--	-20.62

Table 11. Sampling errors for rice, cotton, and wheat, 1989-1991.

Crop	Year	Punjab 4 Districts	Sindh 3 Districts	Pakistan 7 Districts
Rice	1989	5.1	6.9	4.6
	1990	4.6	6.0	4.0
Cotton	1989	9.0	13.8	7.6
	1990	5.3	4.5	4.3
Wheat	1989	3.3	4.5	4.3
	1990	4.0	6.2	3.4
	1991	3.4	4.0	2.7

Source: Ninth Meeting of ADC's Technical Committee, Working Paper on Agenda Item II, Review of Results of Surveys/Studies, Peshawar, June, 1991, p. 2.

Table 12. Area frame sampling (AFS) development costs (in rupees), 1989.

Items	Actual Expenses July 1985-Dec. 1988 7 Districts	Estimated Expenses July 1989-June 1994 Entire Country
Pay and allowances of area sampling frame construction staff	580,500	7,336,000
TA/DA	211,500	3,744,000
Procurement of stratification material	460,000	11,100,000
Area sampling frame operating cost	7,685,000	4,394,000
Repair and maintenance	1,295,000	4,000,000
Commodities and services	9,225,000	4,926,000
Total	19,457,000	35,500,000

Source: Evaluation Report of Agricultural Data Collection (ADC) Component of Food Security Management (FSM) Project, July, 1985 through June 1989. ADC Cell, FBS, Statistics Division 28, August 1989, P-17.

Table 13. Annual costs of AFS vs VMS survey operations, 1989.

Items	Annual Estimated Expenses (Rupees) Area frame sampling	VMS	Area frame sampling as a % of VMS
Pay and allowances of staff	11,700,000	33,464,300	35
TA/DA	1,900,000	1,919,470	99
Repair and maintenance	3,000,000	249,310	1203
Purchase of enumeration	300,000	0	--
Commodities and services	5,500,000	2,341,500	235
Operating costs	800,000	N/A	N/A
Other	1,200,000	187,200	641
Total	24,800,000	38,161,780	64

Source: Evaluation Report of Agricultural Data Collection (ADC) Component of Food Security Management (FSM) Project, July, 1985 through June 1989. ADC Cell, FBS, Statistics Division 28, August 1989, P-18.

Table 14. Resource requirements of two sampling schemes -- VMS and AFS -- based on a January 1989 survey in Sheikhupura.

Items	VMS	Area frame sampling
Sample size	38 Villages	120 Segments
Survey period	January 12-26	January 1-15
Field enumerators, No.	36	10
Man-days in field	540	140
Man-days in office	10	24
Kilometers travelled	18.000	12,300

Source: Government of Pakistan Performance Report of Agricultural Data Collection Component of Food Security Management Project, ADC Cell, FBS, Statistics Division, P-22.

Table 15. FSM/STDT/KSU in-country training summary (1989-1991).

Type of Training	Duration (days)	No. of Individuals	Person-Days
In-country			
1) Statistical Analysis for Micro-Computer Course ADC/FSM	10	2	20
2) Master Trainee Course	24	18	432
3) PASSCO and PFD Storage Operations Personnel	6	697	4182
4) National Seminar/Workshop Wheat Procurement Storage Policies	1	80	80
5) Flour Milling Seminars/Workshops	2	767	1534
6) Bulk Wheat Handling and Storage Research Program Equipment	2	35	70
7) Bulk Wheat Handling and Storage Demonstration	1	110	110
8) Corn Drying and Feed Mill Operations	1	10	10
9) Integrated Post Management Course FAO/PARC	2	49	98
10) Bulk Handing & Storage Conference	2.5	98	245
Subtotal		1,866	6,781
11) Nondegree Academic - 2 semesters each		19	--
Total		1,885	6,781

Source: FFGI/KSU, Semi-Annual Report, Dec. 1990, and personal interviews.

Table 16. FSM/STDT/KSU foreigr training summary (1989-1991).

Type of Training	Duration (weeks)	No. of Individuals	Person-Weeks
Shortcourse			
1) Postharvest Technology in Agriculture	6	1	6
2) Bulk Grain Handling and Storage Facilities Management	3	18	54
3) Postharvest Literature Documentation	1	1	1
4) Postharvest Research Procedures	3	1	3
5) Grain Storage and Marketing Shortcourse-KSU	7	16	112
6) Operations of Virion Chromatograph	2	1	2
7) Grain Storage Management Shortcourse-KSU	4	10	40
8) U.S. Grain Marketing System International Grains Program	2	2	4
9) Flour Milling Executive Training Program	5	2	10
10) ASEAN Seminar on Grain Postharvest Technology	1	2	2
Totals		54	234
Degree Programs			
1) Ph.D. Grain Science-KSU	2 Persons		
2) M.S. Agricultural Engineering-KSU	1 Person		
Total of 57 individuals external training programs			

Source: FFGI/KSU, Semi-Annual Report, Dec. 1990, and personal interviews.

Table 17. FSM/STDT/KSU training summary by province (1989-91).

Department	1989	1990	1991	Total
Punjab Food Department	109		123	232
Sindh Food Department	49	53		102
Balochistan Food Department	72			72
NWFP Food Department		48		48
DG Food MINFA		18		18
Central Testing Laboratory		6		6
Flour Milling	660			660
National Seminar	150		98	248
PASSCO Punjab	170	29		199
PASSCO Sindh	86			86
PASSCO NWFP		5		5
PASSCO & Food Department			100	100
Master Trainers	30			30
Total	1,326	159	321	1,806

Source: STDT/KSU, Calendar of Training 1991.

Table 18. Rehabilitated storage capacity by province (June 1991).

	Storage Capacity (M)	Contract (Rs.)	No. of Contractors
Punjab	357,100	69,927,978	35
Sindh	134,400	36,361,408	7
NWFP	59,400	20,813,962	13
Balochistan	28,000	11,276,035	6
Total	578,900	138,379,363	61

Source: Haris Aquil, USAID/ENGR Monthly Status Report, June 30, 1991.

Table 19. Logical framework outputs versus achievements.

USAID Project Paper Logical Framework Project Outputs	FSM Project Achievements
1. Long-term plan for meeting O&M recurring costs of public-sector godowns.	1. The MINFA, P.F.D's and PASSCO have a tripartite agreement in which Rs. 20/ton of wheat stored will be used from Federal supplied incidental funds for O&M costs. PASSCO will be responsible for the work.
2. Rehabilitation of up to 0.75 MMT of cereal grain godowns.	2. Rehabilitation work is completed on 578,900 tons of wheat storage capacity.
3. 1,885 persons trained (312 person months) in country and abroad, 57	3. In-country training is completed on 3587 person for 9115 man days of training plus 44 degree programs. Training abroad is completed on 3 degree programs and 54 individuals for 58 month months of study tours.
4. Improved maintenance and management of godowns.	4. 1,806 persons have received training in maintenance and management of storage facilities in the public and private sector and are now in position to implement these practices.
5. Reduce storage losses	5. 576 godowns have been rehabilitated permitting improved storage practices and staff trained to use improved storage practices thus losses should be reduced by 3%
6. (a) Improved pest control	6. (a) 2,040 storage persons have been trained in improved pest control plus research, studies and extension work is started in pest control.
(b) Storage design research	(b) The STDT staff and short term consultants are studying this, recommendations to improve existing storage have been made.
7. Improved MOFA in-service training capacity in PHM.	7. The STDT/KSU Training Center has been established and is conducting training programs in Lahore. 33 Master Trainers have completed their programs and are now involved in training.

Source: USAID Project Paper FSM Project. February 1984, Washington, D.C.

Table 20. FSM/postharvest management total number of persons trained.

Description of Training	Planned[1]	Achieved VPCP[2]	Achieved STDT[3]	Achieved Total
External				
Ph.D.	2	-	2	2
MS	6	-	1	1
Study Tours	54	-	57	57
In-Country				
2.0 day 130 persons |				
2.5 day 100 persons |				
3.0 day 850 persons |	1,973	2,040	1,885	3,925
1.0 day 810 persons |				
5.0 day 83 persons |				
Additional training defined during Project implementation				
1. in-country shortcourse	-	6	-	6
2. in-country nondegree 2 academic semesters each	-	-	19	19
3. in-country degree programs[4]				
a. M.Sc.	-	30	-	30
b. M. Phil.	-	11	-	11
c. Ph. D.	-	3	-	3

[1] From Project Paper Table 3, pg 53.
[2] VPCP End of Assignment Report May 1990, Joe Brooks.
[3] FSM/STDT/KSU Semi-Annual Report, Dec. 1990.
[4] Includes 14 underway- due completion 1992.

Table 21. Macroeconomic benefits to Pakistan from the FSM and ASSP projects (1984-1991).

Activity	Realized Impact (Mil. Rs.)	Potential Impact (Mil. Rs.)	Nonexisting but Quantifiable Impact
Subsidy Reduction from Wheat Price Policy.[1]	3232	--	
Subsidy saving from credit reform (0 to 7% mark up).[2]	560	--	
Storage Rehabilitation.[3]	45	--	
Reduction in wheat storage losses due to scientific handling.[4]	26	--	
Improved agricultural data.[5]	--	257	
Reduced borrowing for new wheat storage.[6]	986	--	
Use of bulk handling technology.[7]		75	
Development of institutions.			a) Creation of Economic Wing in MINFA; b) Establishment of Agri-Business Cell; c) Center for training in wheat storage technology.
Total	4849	332	

[1] Wheat subsidy reduction of Rs. 10.15/maund = Rs.406/ha X 7.96 m ha. = Rs. 3232 m.
[2] GOP changed the interest rate on agricultural loans from 0 to 7% per crop season (7% X loans value 1989/90 = Rs. 566 m).
[3] The rehabilitation of 578,900 tons of storage capacity plus training of managers and operators reduces wheat losses by 3%. (at 1991 prices, 3% X 578,900 = 17,367 tons @ Rs.2,600/ton = Rs. 45 m).
[4] Training of storage managers and operators reduces wheat losses by 1% on 1 m ton @ Rs.2,600/ton = Rs.26 m saved annually.
[5]Using the ASF methodology over the VMS, produces 12.47 Kg/ha more wheat in 1991 season.
(12.47 Kg/ha X 7.96 m ha = 9,261 tons wheat @ Rs. 2,600/ton = Rs. 257.4 m saved wheat imports in 1991.)
[6] STDT studies prevented GOP from implementing $41.3 m loan from new storage, results saving Rs. 986 m.
[7] Converting bag to bulk godowns save Rs.1500/ton from storage investment and for 50,000 tons = Rs. 75 m saved.

Annexes

ANNEX 1
WORK PLAN

Final Evaluation of the Food Security Management Project
and
Mid-term Evaluation of the Agricultural Sector Support Program

A. Background

The Food Security Management Project (FSM) was designed to improve the analytical and policy formulation framework, managerial capabilities and the physical capacity to manage the national food security system. The final evaluation will focus on its three related components: (1) agricultural data management (ADC), (2) post harvest management (PHM), and (3) economic policy analysis (EPA). The Agricultural Sector Support Program (ASSP) was conceived as an umbrella project to promote rapid implementation of policy reform in the agricultural sector. The mid-term evaluation of ASSP will only include the technical assistance component of the project.

B. Purpose and Scope of the Evaluation

The purpose of the evaluation is to ascertain the degree to which project goals and objectives were achieved over the life of FSM and the progress made thus far in achieving goals and objectives of the TA sub-component of ASSP. This assessment is expected to lead to recommendations for more efficient use of ASSP project resources for the remainder of project life and to describe lessons learned from FSM that will contribute to improved performance of future AID efforts. In addition to assessment of the use of project resources, the evaluation will focus on the overall developmental impact of the two projects on macro economic variables and institutional performance and capability.

C. Procedure

The time period of the evaluation will cover the period since the midterm evaluation of the FSM project and approximately the first half of ASSP. The evaluation is guided by a detailed statement of work developed by the Agricultural and Rural Development Office, USAID/Pakistan.

The five-person evaluation team prepared a work plan that was approved by project managers at USAID and GOP. The evaluation work plan included schedules for individual team members, a proposed outline for the final report and a procedure to be followed in seeking answers to questions posed by project managers. A specific time schedule was included for the evaluation that conformed with the requirements of the Statement of Work.

The objective of the evaluation team was to provide management information on the use of project resources in tracking progress toward the outputs, purpose and goals defined in the logical framework of the two projects. This information is expected to be useful to project managers in determining what, if any, changes are needed to improve project performance for these two activities and to more effectively contribute to Pakistan economic development.

The procedure followed in seeking answers to questions posed by the evaluation scope of work was to review carefully project documents, publications and financial statements to measure achievements against planned outputs. These quantitative measures were supplemented by qualitative judgments of intended beneficiaries of the two projects from both the private and public sectors, GOP ministries who were participants in the projects, resident technical assistance staff and counterparts, and USAID officials.

Information from these sources was distilled into a report focused on project progress and answers to issues and questions posed by project managers. Analysis of the information led to conclusions drawn from the findings and to recommendations for each project sub-component with designated responsibility for follow-up. Judgments were supported where possible by quantitative data and throughout by the evaluation team's experience and training.

The evaluation team's report follows the format below.

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Chapter II. Economic Policy Analysis (Questions 1,3,4)
- A. Economic Analysis Network (EAN)
- B. Special Studies Program (SSP)

Chapter III. Agricultural Data Collection (Question 5)
- A. Agricultural Sample Frame (USDA)
- B. Other Improvement Approaches (USDA)

Chapter IV. Post Harvest Management (PHM) (Question 2)
- A. Storage Technology Development and Transfer (STDN)
- B. Vertebrate Pest Control (VPC)
- C. Storage Rehabilitation (SR)

Chapter V. Promotion of Agribusiness Activities.

Chapter VI. Conclusions and Recommendations
- A. Conclusions
- B. Major Recommendations
- C. Lessons Learned

Annexes

WORKPLAN FOR THE PREPARATION OF FINAL EVALUATION REPORT

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			May 29 Arrival	May 30 Aid Orientation		June 1 Work plan to AID
2 Background Material	3 Team Visits TO GOP Ministry	4 Approval of Workplan	5	6	7	8 Site Visits
9 Site Visits	10 Site Visits	11 Site Visits	12 Site Visits	13 Contractor's Meeting	14	15 Team Meeting
16 Report Preparation	17	18	19	20	21	22
23 Report Writing/ Analysis	24 Report Writing/ Analysis	25 Report Writing/ Analysis	26	27	28 1st Draft	29
30	July 1 Oral Report	2	3	4 2nd Draft	5	6
7	8 Final Draft	9 Depart	10 Depart	11	12	13

ANNEX 2

PROJECT DESIGN SUMMARY: LOGICAL FRAMEWORK

Food Security Management Project (391-0491)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Program of Sector Goal:	**Measures of Goal Achievement**		**Assumptions for Achieving Goal Targets:**
The broader objective to which the project contributes: To achieve GOP food security objectives in a manner consistent with the rational and efficient use of national resources, overall economic development of the country, and an improved living standard for farm families and the population at large.	- Improved foreign exchange situation - Improved quality of development projects & programs benefitting a substantial portion of rural inhabitants - Increased production and availabilities of food and fiber - Increased per capita incomes.	- Published data on national income accts. - GOP planning budget documents - Basic socio-economic data - AID project reports - Field observations	- Continued GOP commitment to improve national food security.
Project Purpose:	**Conditions that will Indicate Purpose has been achieved (EOPS)**		**Assumptions for Achieving Purpose and Outputs:**
To improve the analytical and policy formulation framework, the managerial capabilities and the physical capacity of the GOP to manage the national food security system effectively and efficiently. &	- A national network of analytic resources is in place addressing priority policy issues in food security management through quality, relevant economic analysis. - An improved ag. data collection system based on the ASF methodology is in place and providing reliable data on a systematic and continuous basis. - The provincial storage system is operating with reduced grain losses at a lower cost per unit stored due to the enhanced state of godown repair, better trained personnel with access to modern and appropriate storage technology, and improved management practices (including an effective maintenance program with a sufficient budget.	- Project evaluations - Special economic surveys, studies and reports - Ag. area and production data published - AID and GOP project records. - Field observations.	- Technologies proposed are cost effective and appropriate. - Acceptable quality control of data collection, godown rehabilitation & economic studies can be enforced. - Continued commitment of federal provincial governments to improve ag. sector planning & operations through data collection, economic analysis and management. - The analytic work will be utilized by decision makers.

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Outputs	**Magnitude of Outputs:**		
nstitutional capacity and resources to carry out economic and policy analysis	A role & mandate agreed upon by all government institutions for the economic analysis networks on Economic Analysis Network Group that is well organized & fully staffed with qualified personnel; an ongoing economic and policy analysis program based on an annual research agenda developed by a high level GOP steering committee; completion of at least two major specific policy analyses; and 239 persons trained (62 p.m.) in-country or abroad.	- Special economic surveys, studies and reports - Ag. are and production data published - AID and project records - Field observations	Project evaluation-Sufficient GOP staff will be made available. Project advisors are successful in transferring skills and technology to government agencies and selected private sector firms. - GOP prepares and approves PC-1s as needed. - Qualified staff are selected for training.
An improved system for ongoing collection of ag. data in accurate and efficient manner.	- Establishment of a national area sample frame; 408 persons trained (297 p.m) in-country and abroad; publication of production statistics on a scheduled basis, reduction in data collection time & costs and improved planning resulting from more accurate & timely ag. statistics.		- Necessary skills and materials are available locally for all civil works activities.
A provincial grain storage system with upgraded facilities, better trained personnel, and improved management & maintenance sub-systems.	- A long-term plan with performance targets for meeting O&M recurrent costs of public sector godowns established; rehabilitation of up to 0.75 MMT of cereal grain godowns; 1,885 persons trained (312 p.m) in-country and abroad 57; improved maintenance & management of godowns; reduced storage losses; improved pest control & storage design research and an improved in-service training capacity in PHM.		

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Inputs:	**Implementation Target:** (Type and Quantity)		**Assumptions for Providing Inputs:**
1. AID			
- Short & Long-term technical assistance disbursements - Short & Long-term academic & non-academic training in U.S. and Pakistan. - Vehicles and other equipment - Civil works for godown rehabilitation (MFAR) - Local project staff - Seminars & conferences - Study of O&M recurrent costs and management audit of all public sector godowns - Contractor costs for economic studies and surveys and PHM research studies; survey of existing godowns plus design & implementation plan for rehabilitation and additional personnel costs for phasing in ASF - Budget support for PU/MOFA	See financial analysis, implementation schedule and commodity, TA and training plans in the project paper.	- AID and GOP project records and financial documents are made on a timely basis. - Project evaluations	- AID & GOP funding levels proposed are approved and - Appropriate overseas training programs can be identified. - Construction is undertaken according to agreed upon standards and practices and is certified for 80 percent reimbursement by AID - GOP meets the conditions precedent - Appropriate consultants can be recruited to provide required technical assistance.
2. GOP			
- Staff salaries and operating expenses - Operating and Maintenance costs for all rehabilitated facilities. - 20% of costs for rehabilitation			

ANNEX 3A

USAID/FSM PROJECT COMMODITY PROCUREMENT SURVEY BY DIVISIONS

PIOC NO.	COMMODITY		COMMITTED	DISBURSED
	EAN			
40350	Chemonics Economic Analysis.		100,000	98,062
50296	Chemonics Economic Analysis.		36,957	36,957
60233	IFPRI.		51,000	49,940
		EAN SUB-TOTAL:	187,957	184,959
	ADC			
40343	USDA - NASS.		540,000	540,000
60124	USDA - NASS.		288,068	288,068
		ADC SUB-TOTAL:	828,064	828,064
	PHM			
40508	USDA - DWRC (VPCP).		8,000	8,000
40348	USDA - DWRC (VPCP).		48,602	48,602
80171	USDA - DWRC (VPCP).		13,139	--
		SUB-TOTAL:	69,641	56,602
	KSU (STDT)			
40507	KSU - FFGI.		10,825	10,825
50186	KSU - FFGI.		95,958	95,958
80170	KSU - FFGI.		21,300	21,300
60244	KSU - FFGI.		282,392	282,392
		SUB-TOTAL:	410,475	389,175
	KSU/PASSCO			
8-179	KSU -Silo Renovation.		61,550	58,947
PIL 52	KSU - farm Tractors.		33,644	--
PIL 52	KSU - Bulk Handling Equipment.		32,007	--
PIL 52	KSU - Bulk Handling Equipment.		35,689	--
60306	KSU - Bulk Handling Equipment.		196,780	195,808
PIL 52	KSU - Bulk Handling Equipment.		42,085	42,085
80103	KSU - Bulk Handling Equipment.		958,085	937,793
		SUB-TOTAL:	1,359,840	1,234,633
		PHM SUB-TOTAL:	1,839,956	1,680,410
	PHM JOINT COMMODITIES			
40355	Small Value Items, Computors and Office Equipments.		24,358	24,358
40363	Household furniture for T.A's.		145,244	145,244
40405	Vehicles.		45,487	45,487
50149	Household Equipment ofr T.A's.		162,116	162,116
50271	Small Value Items-Office Supplies.		4,201	4,201
50387	Computors & Office Equipments.		145,455	--
60090	Small Value Items - Computors		59,117	54,800
80183	Computors & Equipments.		65,618	39,356
80199	Computors & Equipments.		353,712	41,999
40351	Vehicles.		209,497	209,497
60171	Vehicles.		177,001	177,001
		SUB-TOTAL:	1,359,840	1,234,633
		FSM TOTAL:	4,247,787	3,597,496

Source: Comprehensive Pipeline Report, 6/19/1991, USAID FSM Project 3910491, Accounts Section.

ANNEX 3B

USAID/FSM PROJECT COMMODITY PROCUREMENT SUMMARY

PIOC NO.	COMMODITIES	COMMITTED $	DISBURSED $
PIL 52	Farm Tractors.	33,644	0
40351	Vehicles and Motorcycles	209,497	209,497
40355	Small Value items,	24,358	24,358
40363	House hold furniture for T.A.	145,244	145,244
40405	Vehicles.	45,487	45,487
40508	PASA with USDA - DWRC.	8,000	8,000
40343	PASA with USDA - NASS.	540,000	540,000
40348	DWRC (Computers, camera equipment).	48,602	48,602
40350	Chemonics (Economic Analysis).	100,000	98,062
40507	KSU - FFGI.	10,825	10,825
PIL 52	KSU - Bulk Handling Equipment.	26,922	--
50149	Household Application & equipment	162,116	162,116
50271	Small value items-office supplies.	4,201	4,201
50387	Computers and Office equipments.	145,455	--
50186	KSU - FFGI.	95,958	95,958
50296	Chemonics (Economic Analysis).	36,957	36,957
PIL 52	KSU - Bulk handling equipment.	35,689	--
60090	Small value items - Computers	59,117	54,800
60171	Vehicles and Motorcycles.	177,001	177,001
60306	KSU - Bulk handling equipment.	196,780	195,808
60124	USDA - NASS.	288,068	288,068
60233	IFPRI.	51,000	49,940
60244	KSU/FFGI.	282,392	282,392
PIL 52	KSU - Bulk handling equipment.	42,085	--
80103	KSU - Bulk handling equipment.	958,085	937,793
80179	KSU - Silo Renovation.	61,550	58,947
80183	Computers & Equipments.	65,618	39,356
80199	Computers & Equipments.	353,712	41,999
80171	USDA - DWRC.	13,139	--
80170	KSU/FFGI.	21,300	--
	TOTALS:	4,242,852	3,555,461

Source: Comprehensive Pipeline Report, 6/19/1991, USAID FSM Project 3910491, Accounts Section.

ANNEX 4A

FSM PROJECT VEHICLE DISTRIBUTION**

PIDC NUMBER	VEHICLE DESCRIPTION	QUAN-TITY	USER
-			
60171	Pajero	1	T. J. Byram, Islamabad.
40351	Toyota L.C.	5	T. J. Byram, Islamabad.
40351	Toyota Hi Ace.	1	T. J. Byram, Islamabad.
60171	Pajero	1	D.G. S. M. Ishaq, F.B.S, Islamabad.
40351	Toyota L.C.	1	D.G. S. M. Ishaq, F.B.S, Islamabad.
60171	Suzuki Jeep	1	Dept. Ent., University, Faisalabad.
40351	Toyota Hi Ace.	1	Barry Primm, USAID/ARD, Islamabad.
40351	Toyota L.C.	2	Marito Garcia, Lahore.
40351	Toyota L.C.	1	Chief of Party, EAU, Islamabad.
40405	Suzuki Jeep	1	Joe E. Brooks - VPCP, Islamabad.
60171	Suzuki Jeep	1	Joe E. Brooks - VPCP, Islamabad.
40351	Toyota Hi Ace	1	Joe E. Brooks - VPCP, Islamabad.
	SUB-TOTAL:	17	
40351	Suzuki m.c.	10	Dir. Mh. Afzal Khan,C.R.S., Lahore.
60171	Kawasak, m.c.	6	Sr.Stat., Matrullah Khan, Peshawar.
60171	Kawasak, m.c.	9	M.Afzal Khan, C.R.S., Lahore.
40351	Suzuki m.c.	1	Iftikhar Hussain, NARC, Islamabad.
40351	Suzuki m.c.	8	ADC, Deptt., Agriculture, Sindh.
40351	Suzuki m.c.	1	Dir. Ag. Policy, MINFA - Islamabad.
60171	Kawasaki, m.c.	8	-- --
40351	Suzuki, m.c.	10	--
	SUB-TOTAL:	53	
	TOTAL:	70	Vehicles.

Source: Project offices Inspection Report - Commodity Trading System 9-3-1985 to present; Stephen Klaus, C.M.O. USAID, Islamabad, 6-27-1991.

ANNEX 4B

PROCUREMENT STATUS REPORT

PIO	DATE	COMMODITIES/ USER	EAN MARKED VALUE	UNCOMMITTED FUNDS
40350	1-9-85	Chemonics	$ 861,884	--
40354	3-20-85	IFPRI	655,721	--
50186	10-1-85	KSU	498,882	--
40351	3-3-85	Vehicles	209,497	--
40355	1-3-85	Small Value Items	24,358	--
40363	2-27-85	Household goods T.A's.	145,244	--
40405	12-2-85	Vehicles	45,487	--
50149	6-6-85	Household goods T.A.'s	152,166	--
50271	11-3-85	Small Value Items	9,000	6,600
60090	9-29-86	Small Value Items	45,000	23,800
60171	4-27-87	Vehicles	177,001	--
60256	4-16-87	(?)	30,506	30,500
60306	1-9-89	KSU	209,000	14,867
80103	4-30-89	KSU	1,008,360	46,361
80179	6-7-90	KSU	68,000	245
80183	6-24-90	Computers	95,418	38,540
80199	6-4-91	Computers	369,339	78,780
PIL 52	4-9-91	(?)	200,000	200,00
50387	4-8-91	Computers	170,000	29,682
		Totals:	4,984,857	469,375

Source: Procurement Status Report, Commodity Tracking System, USAID/ARD, 6/6/91, FSM 391-0491.

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ANNEX 5

LIST OF CONTACTS

GOVERNMENT OF PAKISTAN, ISLAMABAD

Ministry of Food, Agriculture and Cooperatives (MINFA).
- Mr. Muzaffar Ahmed, Secretary.
- Mr. Javed Masud, Addl. Secretary.
- Mr. A. W. Qazi, Addl. Secretary.
- Dr. Imtizaj Hussain, Addl. Secretary/Ag. Devel. Comm.
- Mr. Mohammad Bashir, Joint Secretary.
- Mr. Shahid Najam, Dy. Secretary (Agribusiness Cell)
- Dr. A. H. Maan, Dir. Gen. Econ. Wing.
- Mr. Aslam Jafri, Dir. Stat. Econ. Wing.
- Mr. Bashir Ahmad Malik, Dir. Ag. Policy, Econ. Wing.
- Mr. Muhammad Afzal, Chairman, Agr. Prices Commission.

Ministry of Finance
- Dr. Imtiaz Ahmed, Secretary, Statistics Division
- Mr. S. M. Ishaque, Dir. Gen. Federal Bureau of Statistics
- Mr. Shahid Naeem, Chief Stat. Officer, Federal Bureau of Statistics.

Ministry of Production
- Mr. Istaqbal Mehdi, Gen. Mgr, Experts Advisory cell.

Government of Punjab, Lahore.
- Mohammad Sadiq Cheema, Secretary Agriculture,
- Mr. Raja Muhammad Aslam, Dir. of Food, Govt. of Punjab.
- Dr. Muhammad Arif, Chairman, Planning and Development Department, Punjab Civil Secretariat.
- Dr. Muhammad Jamil, Director, Punjab Economic Research Institute.
- Mr. Rana Ata-ul-Haque, Project Coordinator ADC & Director, Crop Report Service, Agriculture Department.
- Mr. Chaudhry Mohammad Afzal Khan, OSD, Ex-Director Crop Reporting Service.

University of Karachi, Tropical Agri. Res. Inst./Grain Storage Res. Lab.
- Dr. Ghulam Jalari
- Dr. Noor Ullah
- Mr. Mubarak Ahmad.

University of Agriculture, Faisalabad.
- Dr. Ashar Beg Mirza, Prof. Zoology & Fisheries.
- Dr. Nadeem Sheni Ahmad, Dean Faculty of Sciences.
- Dr. M. Hafeez Khan, Assoc. Prof. of Entomology.
- Dr. A. Rehman, Vice Chancellor.
- Dr. Ahmad Nadim Shery, Dean Faculty of Basic Sciences.
- Dr. Ali Mohammad Chaudhry, Professor Agriculture Economics.
- Dr. Mohammad Bashir, Associate Professor.
- Dr. Anwar-ul-Haq, Dean Faculty of Agriculture Economics.
- Dr. Mirza Azhar Baig, Professor of Zoology.
- Dr. Rana Abdul Hafiz, Associate Professor.

National Agri. Research Council/Vertebrate Pest Control Project, Islamabad.
- Mr. Ejaz Ahmed, Team Leader FSM/PHM/VPC Project.
- Mr. Abdul Aziz Khan, Principal Scientific Officer.

National Agri. Research Council, Social Sciences Division.
- Dr. Agha Sajjad Haider.

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- Mr. George R. Landsverk, Mgr. Director
- Mr. Aamir Z. Farooqi, Controller

Pioneer Pakistan Seed Ltd. Lahore
- Mr. Shahid Iftikhar, Dy. Mgr. Director.

National Fertilizer Marketing Ltd., Lahore.
- Dr. Muhammad Rashid, Senior Manager (Tech)
- Mr. Iqbal Chaudhry, Sen. Mgr (Market Res.)

Kohinoor Edible Oils Ltd, Lahore
- Mr. Abdul Waheed Khalid, Gen. Manager.

LMA-MPL, Lahore
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Mr. Shakil A. Qureshi, Supt. Engr.
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USAID, LAHORE
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Mr. Ghulam Murtaza Baluch, ADC Prov. Project Director
Mr. Shaukat Iqbal, Chief Programmer, ADC

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Dr. Roe Borsdorf, Ag. Econ.
Dr. Ulysses A. Acasio, Ag. Engr.
Mr. Shamsher Haider Khan, Pro. Spec.

Denver Wildlife Research Center - VPCP Project
Dr. Joe E. Brooks, Team Leader.

Chemonics Inter. ASSP/EAN Project
Dr. Richard McConner, Team Leader
Dr. Leroy Quarice, Ag. Econ.

NASS/USDA - FSM/ADC Project
Mr. Robert Addison, Team Leader

WINROCK INTER.
Dr. Bill Wright - MART Project
Dr. Charles Hatch, FPDP Project

RONCO Consulting Corp.
Mr. George Metcalfe, Chief of Party
Mr. Gordon W. Kunde. Corporate Agri. Bu. Spec.
Mr. Asad Khan, Dir. Project Devd.
Mr. Amer Raza , Coord. Agri. Bu. Cell
Mr. Maqsood Chaudhry, Economist.
Dr. Steve Davies, ICARD

IFPRI
Dr. Sohail J. Malik, Chief of Party

FAO/ADB

Dr. Manuel M. Mannel Jr. FAO Advisor, Development of Agricultural Management Information System. MINFA Econ. Wing.

Mr. Jahed-ur Rehman, Senior Project Implementation Officer, Asian Development Bank.

ANNEX 6

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ANNEX 7

FSM/STDT/FFGI/KSU PUBLISHED AND UNPUBLISHED REPORTS AND OTHER ACTIVITIES

PUBLICATIONS:

1. Shuyler, H., et al. "Review of Feasibility of Bulk Wheat Handling and Storage in Pakistan, Consultants Report", (Pakistan Report No.1) October 1986.
2. Borsdorf, R., et al. "Bulk Wheat Handling and Storage Pilot Project in Pakistan", (Pakistan Report No.2) October 1987.
3. Maxon, R., et al. "Impact of Fair Average Quality Procurement Procedures and No Loss Policy on Public Sector Storage of Wheat", (Pakistan Report No. 3) December 1988 Revised October 1989, Volume I, II, III.
4. Boarsdorf, R., and R. Maxon. "Development Activities in the Post Harvest Wheat Sector of Pakistan", (Pakistan Report No. 4) May 1990.
5. Acasio, U., and Maxon, R. "Integrated Pest Management in Hexagonal Bias", STDT/FSM/USAID Project October 1990.
6. Acasio, U., et al. "Integrated Pest Management of Bagged Grain in House type Godowns", (Storage Technology Development and Transfer, FSM Project, A PARC/GOP/USAID/FFGI-KSU) January 1991.
7. Acasio, U., et al. "Grain Grading, Handling, Storing and Marketing of Cereal Grains", A Reference Manual - STDT/FSM/USAID June 1989.

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1. Mantemayer, M., Estimated Cost of Bulk Handling Equipment at PASSCO Storage Center, Depalpur", May 1990.
2. Mantemayer, M., "Estimated Cost of Bulk Handling of Wheat at PASSCO Storage Center, Depalpur", May 1990.

UNPUBLISHED REPORTS/ACTIVITIES:

1. Bulk wheat delivery to Flour Mills at Multan;
2. Bulk wheat handling equipment modification and development;
3. Bulk wheat handling system for bagged - grain warehouses;
4. Silo renabilitation;
5. Hexbin Modernization;
6. Assistance in mechanization of private sector warehouse;
7. The case for a modern grain import/export facility at Port Qasim - briefing paper for MINFA by STDT June 1990.

PUBLICATIONS IN URDU:

1. Pests Control in stored wheat;
2. Important pests of stored grains;
3. Training manual; food products, grading, administration, storage and trade;
4. Operation and maintenance manual for bulk Handling Equipment;
5. Pest control in stored produce;
6. Inspection, house keeping and godowns management;
7. Principal stored grain insects;

LIST OF MEMBERS OF ADC STEERING COMMITTEE *

1.	Secretary, Statistics Division.	Chairman
2.	Director General, Federal Bureau of Statistics.	Member
3.	Joint Secretary, MINFA, Food Division, Islamabad.	"
4.	Economic Consultant, MINFA, Food Division, Islamabad.	"
5.	Secretary, Agriculture Department, Government of Punjab, Lahore.	"
6.	Secretary, Agriculture, Livestock & Food Department, Government of Sindh, Karachi.	"
7.	Secretary, Agriculture, Forests & Coperative Government of NWFP, Peshawar.	"
8.	Secretary, Agriculture Department, Government of Baluchistan, Quetta.	"
9.	Deputy Director General, Federal Bureau of Statistics, Karachi.	Member/Secretary

Functions of the Steering Committee:

1) Coordination among Federal and the Provincial Government and USAID for effective implementation of the scheme;

2) To keep liaison with the Provincial Governments on administrative matters relating to the scheme;

3) Identify problem areas effecting speedy implementation of the scheme and find out solution to overcome the same;

4) Finalization of foreign training requirements of Federal and Provincial governments in connection with the scheme;

5) Monitoring of progress of various phases of the scheme.

* GOP Ministry of Finance and Economic Affairs, Statistical Division, PC-1 Form A Revised.

LIST OF MEMBERS OF ADC TECHNICAL COMMITTEE *

1.	Deputy Director General Federal Bureau of Statistics (Karachi.	Chairman
2.	Deputy Director General Statistics Division.	Member
3.	Director Crop Reporting Service Department of Agriculture Government of Punjab, Lahore.	"
4.	Joint Director of Agriculture, Department of Agriculture, Government of Sindh, Hyderabad.	"
5.	Senior Statistician, Department of Agriculture, Government of NWFP, Peshawar.	"
6.	Statistician, Agriculture Department, Government of Baluchistan, Quetta.	"
7.	Director, ADC (Agriculture Statistics), Federal Bureau of Statistics, Islamabad.	Member/Secretary
8.	Economic Consultant, M/O Food & Agriculture.	Member
9.	Representative, U.S.AID, Islamabad.	"

Functions of the Technical Committee:

1) To keep liaison with the Provincial Governments on technical matters relating to implementation of the scheme;

2) To prepare schedule of activity of different phases of the scheme;

3) To prepare proposals for the foreign training and within country training of staff to be engaged for implementation of the scheme;

4) To monitor progress of the scheme;

5) To review the report regarding implementation of pilot pro-ject near before its submission to the Steering Committee.

* GOP Ministry of Finance and Economic Affairs, Statistical Division, PC-1 Form A Revised.

ANNEX 10

OUTLINE OF AGRICULTURAL DATA COLLECTION OF ADC UNDER ASSP

I. PRODUCTION STATISTICS:

A. Complete national area frame;
B. Initiate yield estimates for major crops;
C. Investigate alternate methods for estimates on area and yield of minor crops;
D. Explore methods for providing interim (Current) Livestock Statistics between census and livestock products data. i.e. milk production and slaughter.

II. ECONOMIC STATISTICS:

A. Prices, farm, wholesale, retail;
B. Price index series;
C. Cost of production and production inputs;
D. Agriculture labor, including labor force, cost and migration effects on labor supply;
E. Land tenure;
F. Farm credit, cost use availability, sources;
G. Cold storage;
H. On-farm grain stocks;
I. Marketing:

1) Agriculture market structure;
2) Market channels;
3) Marketing costs;
4) Losses in the market;
5) Transportation;
6) Export-import trade (Monitoring of international markets).

III. TRAINING:

A. Foreign degree training;
B. Foreign Short-term training;
C. In-country training;
D. Statistical training institute;

IV. TECHNICAL ASSISTANCE:

A. Long-term technical assistance;
B. Short-term technical assistance.

V. COMMODITIES:

A. Vehicles;
B. Computers, 100 micro-computers, 1 main frame;
C. Miscellaneous: text books, training equipment, office equipment (typewriters, photocopiers etc.);

VI. AERIAL PHOTOGRAPHY:

A. Photographic laboratory equipment;
B. Nation-wide aerial photography.

UNCLASSIFIED
AID 5/29/91
DIR: JANORRIS
ARD: AWASAY: AW
ARD: HPPETERSON, PRO: MGELERSON, AGAT: RTILSWORTH,
AID AMB DCM, ECON AGATT 5

AMEMBASSY ISLAMABAD
SECSTATE WASHDC, PRIORITY

AIDAC

FOR ENE/PD AND ENE/TR

E.O. 1256: N/A
SUBJECT: AGRICULTURAL SECTOR SUPPORT PROGRAM
(391-0492): POLICY REFORMS

REF: (A) 90 ISLAMABAD 13118 (B) 90 ISLAMABAD 13452
(C) 90 ISLAMABAD 13834 (D) 90 STATE 253140 AND (E) ISLAMABAD 5435

A. SUMMARY:

1. THIS CABLE REPORTS THE CUMULATIVE PROGRESS ON THE POLICY REFORM AGENDA PRIMARILY OUTLINED IN THE PAAD (DATED SEPTEMBER 24, 1987) FOR THE SUBJECT PROGRAM. THE PROGRAM, AMONG OTHER THINGS, ENVISAGED A POLICY REFORM DIALOGUE WITH THE GOP TO REMOVE, OVER A PERIOD OF SIX YEARS (FY88-93), KEY CONSTRAINTS TO INCREASED ECONOMIC GROWTH IN THE AGRICULTURAL SECTOR. A RESOURCE TRANSFER IN THE FORM OF SECTOR GRANT OR CIP WERE TO BE USED AS LEVERAGE FOR THIS PURPOSE.

2. THREE TRENCHES OF THE SECTOR GRANT HAVE BEEN DISBURSED, BASED ON POLICY BENCHMARKS NEGOTIATED EACH YEAR. NON-CERTIFICATION BY THE PRESIDENT ON THE PRESSLER AMENDMENT PRECLUDES ANY FURTHER RESOURCE TRANSFERS. MISSION WILL, HOWEVER, CONTINUE ITS EFFORTS TO BRING ABOUT POLICY CHANGES SUPPORTED BY CONSULTANT REPORTS, STUDIES, SEMINARS, AND DIALOGUE, AND WILL CONTINUE TO REPORT ANNUALLY CHANGES RESULTING FROM MISSION'S POLICY INITIATIVES.

3. MISSION HAS MADE MAJOR PROGRESS IN REMOVING SUBSIDIES (ESPECIALLY WHEAT MARKETING AND FERTILIZER), REDUCING PRICE DISTORTIONS (PARTICULARLY WHEAT), AND IN PROMOTING PRIVATIZATION (E.G., FERTILIZER AND EDIBLE OIL). POLICY BENCHMARKS HAVE BEEN USEFUL IN REINFORCING PROJECT ACTIVITIES IN INSTITUTIONAL STRENGTHENING.

4. WHEAT PROCUREMENT AND RELEASE PRICES NOW RESULT IN GOVERNMENT RECOVERING ABOUT 86 PERCENT OF ITS MARKETING COSTS, COMPARED TO 13 PERCENT AT THE BEGINNING OF ASSP. THE GOVERNMENT HANDLES OVER 4 MILLION TONS OF WHEAT PER YEAR, SO THE SAVINGS ON THESE MARKETING COSTS ALONE ARE AT LEAST RS. 2 BILLION (ROUGHLY DOLS 100 MILLION). THE FERTILIZER SUBSIDY WAS BY FAR THE LARGEST SUBSIDY TO AGRICULTURE. THROUGH BENCHMARKS OF ASSP AND WORLD BANK, ALL OVERT FERTILIZER SUBSIDIES ARE BEING PHASED OUT. THE SUBSIDY ON PHOSPHATIC FERTILIZER WILL BE COMPLETELY REMOVED BY OCTOBER, 1991, AT WHICH TIME FULL FREEDOM FOR THE PRIVATE SECTOR TO IMPORT AND DISTRIBUTE FERTILIZER IS EXPECTED.

5. IN A MAJOR SHIFT IN POLICY, THE GOVERNMENT HAS ANNOUNCED THAT IT WILL PRIVATIZE AT LEAST FIVE PUBLIC SECTOR FERTILIZER PLANTS. THESE COMPRISE OVER 23 PERCENT OF THE PUBLIC SECTOR'S CAPACITY. BOTH PUBLIC AND PRIVATE SECTOR FIRMS ARE ALSO PROCEEDING WITH EXPANSION PLANS. WITH ALL NEW CAPACITY ON LINE, PRIVATE SECTOR SHARE OF TOTAL CAPACITY WOULD INCREASE TO 29 PERCENT FROM 23 PERCENT; IF ALL PROPOSED DISINVESTMENT OCCURS, PRIVATE SECTOR SHARE WOULD RISE TO 41 PERCENT. AN ORDINANCE HAS ALSO BEEN PROMULGATED THAT FACILITATES THE PRIVATIZATION OF GHEE CORPORATION OF PAKISTAN (GCP) PLANTS. LOSS-MAKING PLANTS WILL BE DISINVESTED.

6. MISSION ACTIVELY PURSUED INSTITUTIONALIZATION OF A POLICY AND ECONOMIC ANALYSIS UNIT WITHIN MINFAC. AS A RESULT THE MINISTRY OF FOOD, AGRICULTURE AND COOPERATIVES ESTABLISHED AN ECONOMIC WING IN 1988/89. ADDITIONAL PERMANENT POSITIONS WERE FUNDED, NAMELY A DIRECTOR OF AGRICULTURAL POLICY AND SIX SUPPORT STAFF.

7. ASSP HAS BEEN QUITE SUCCESSFUL IN MEETING ITS SPECIFIC OBJECTIVES. IN THE PAAD, 5 GENERAL AND 32 SPECIFIC TARGETS WERE FORMULATED. IN THE FIRST THREE YEARS OF AN ANTICIPATED SIX-YEAR PROGRAM, POLICY REFORM BENCHMARKS ADDRESSING ISSUES IN 20 OF THE 32 SPECIFIC TARGET AREAS WERE DRAFTED AND AGREED TO BY THE GOP. FIVE ADDITIONAL BENCHMARKS ADDRESSED OTHER IMPORTANT CURRENT POLICY ISSUES. VIRTUALLY ALL BENCHMARKS WERE MET.

8. DIALOGUE PROCESS HAS ENHANCED RAPPORT WITH GOP TECHNICAL AND MANAGERIAL PERSONNEL. THUS THE ENVIRONMENT FOR NON-LEVERAGED POLICY REFORM IS FAR BETTER THAN IN THE PAST. REASONS FOR THIS INCLUDE 1) AN INCREASED AWARENESS AND RECEPTIVENESS AMONG TECHNOCRATS WHO HAVE PARTICIPATED IN THE POLICY REFORM DIALOGUE AND/OR TRAINING AND 2) THE POLITICAL WILL OF THE NEW PRIME MINISTER TO LIBERALIZE THE ECONOMY AND TO USE THE PRIVATE SECTOR FOR DEVELOPMENT. THE PRIME MINISTER HAS A PRIVATE SECTOR INDUSTRIAL BACKGROUND, WHICH IS A DEPARTURE FROM THE PAST LANDOWNER AND MILITARY LEADERS. END SUMMARY.

ANNEX 12A: STRATA DESCRIPTION ADOPTED FOR VARIOUS CATEGORIES OF LAND USES IN PAKISTAN.

Stratum Number	Description of Strata
11	Intensive agriculture, 60 to 100% cultivated, rainfed.
12	Intensive agriculture, 60 to 100% cultivated, irrigated.
21	Extensive agriculture, 30 to 59% cultivated, rainfed.
22	Extensive agriculture, 30 to 59% cultivated, irrigated.
31	1 to 29% cultivated, irrigated or rainfed, and/or pasture.
41	Land not suitable for cultivation or pasture.
42	Land reserved for National Security.
51	Urban Areas.
52	Village and other agri-urban areas.
61	Forest or concentrations of large trees.

Source: Government of Pakistan Performance Report of Agricultural Data Collection Component of Food Security Management Project. ADC Cell, Federal Bureau of Statistics, Statistics Division, Islamabad, p-12.

ANNEX 12B: NUMBER OF STRATA, TOTAL NUMBER OF FRAME UNITS TOTAL NUMBER OF SEGMENTS, NUMBER OF SEGMENTS SELECTED BY ENLARGEMENT & POINT SAMPLING & RANGE OF SEGMENT SIZE.

District	No. of Strata	Total No. of Frame Units	Total No. of Segments	No. of Segments Selected			Segment Size Range in Sq. Km.
				By Enlargement	By Point Sampling	Total	
Sheikhupura	5	1266	28025	47	81	128	0.100 - 0.250
Faisalabad	4	3409	24823	96	04	100	0.100 - 0.785
Jhang	6	3751	32416	116	12	128	0.100 - 0.785
Multan	6	3062	26795	91	09	100	0.100 - 0.785
Nawabshah	7	2809	25316	119	01	120	0.100 - 0.785
Larkana	8	3079	24762	100	12	112	0.100 - 0.785
Hyderabad	5	2279	21499	113	07	120	0.100 - 0.785

Source: Government of Pakistan Performance Report of Agricultural Data Collection Component of Food Security Management Project, ADC Cell, Bureau of Statistics, Statistics Division, pp. 13-15.

ANNEX 12C: ACREAGE (IN 000 ACRES) COMPARISONS USING ASF AND VMS SAMPLES FOR WHEAT, RICE AND COTTON BY AREA, CROP YEARS, 1989-90 AND 1990-91.

Area/Crop	1989-90				1990-91			
	ASF	CV %	VMS	% Diff	ASF	CV %	VMS	% Diff.
WHEAT								
4 Dists. Punjab	2,945	2.6	2,829	3.95	2,977	2.6	2,770	6.94
3 Dists. Sindh	938	4.6	8.89	5.21	845	4.8	896	-6.61
7 Dists. Pakistan	3,883	2.3	3,718	4.25	3,822	2.3	3,668	4.08
RICE								
4 Dists. Punjab	790	5.6	643	18.64	882	5.6	729	17.93
3 Dists. Sindh	641	7.9	589	8.04	668	7.7	547	18.04
7 Dists. Pakistan	1,431	4.7	1,232	13.89	1,550	4.6	1,271	17.98
COTTON								
4 Dists. Punjab	1,263	4.9	1,130	10.53	1,271	5.2	1,208	4.96
3 Dists. Sindh	358	8.6	468	-30.51	420	8.3	462	-10.16
7 Dists. Pakistan	1,621	4.3	1,598	1.46	1,691	4.5	1,670	1.21

Source: Ninth Meeting of ADC's Technical Committee Working Paper on Agenda Item II, Review of the Results of Surveys/Studies. Peshawar, June 1991, pp. 16, 19, 21, 24.

ANNEX 12D: ASF ACREAGE ACTIVITY CALENDAR, JANUARY 1991.

Activity	Target Date	Actual Date
Complete summaries.	16-2-91	22-2-91 Sindh 27-2-91 Punjab
Clean edited data in Islamabad.	12-2-91	20-2-91 Sindh 24-2-91 Punjab
Clean edited data in processing centers.	10-2-91	18-2-91 Sindh 23-2-91 Punjab
All field work to data processing centers.	31-1-91	2-2-91 Sindh 13-2-91 Punjab
Complete all field work.	27-1-91	2-02-91 Sindh 1-02-91 Punjab
First computer edit 525 segments.	26-1-91	13-02-91 Sindh
Complete quality control.	26-1-91	2-03-91 Punjab
First computer edit 125 segments.	15-1-91	5-02-91 Sindh
Start survey work.	7-1-91	7-01-91 Sindh 5-01-91 Punjab
Complete training of enumerator.	5-1-91	5-01-91 Sindh 3-01-91 Punjab
Install at processing centers data entry/edit/ summary procedures.	30-12-90	30-12-90
Print training materials and questionnaires.	20-12-90	2-01-91

Source: Agricultural Sector Support Program. Agricultural Data Collection Component, Quarterly Report, January 1 - March 31, 1991. (DRAFT)

ANNEX 12E: ASF RABI WHEAT OY SURVEY ACTIVITY, CALENDAR 1991.

Activity	Target Date	Actual Date
Complete laboratory work for data collected first field visit	31-3-91	10-4-91 Sindh 6-4-91 Punjab
Field observation and carrying out of clip areas and count units to field visit.	2/3-11-91	12-3-91 Sindh 11-3-91 Punjab
Training of enumerator and field practice.	24/25-2-91	25-2-91 Sindh 27-2-91 Punjab
Set up laboratory at Islamabad ADC Office.	21-2-91	21-2-91
Printing and dispatch of questionnaires.	17-2-91	14-2-91
Summary of acreage for sample selection.	17-2-91	22-2-91 Sindh 27-2-91 Punjab
Printing/photocopy of questionnaires and manual of instruction.	16-2-91	12-2-91
Notify project coordinator of location, dates & time of training.	14-2-91	13-2-91
Notify project coordinator of preparation of survey materials.	7-2-91	13-2-91
Computer edit and plan of summary specifications.	5-2-91	5-2-91
Finalize enumeration dates.	20-12-90	2-01-91

Source: Agricultural Sector Support Program, Agricultural Data Collection Component, Quarterly Report, January 1 - March 31, 1991 (Draft)

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ANNEX 12F: WHEAT OBJECTIVE YIELD (Kg./Hect.) ASF VS VMS, by DISTRICT 1988-89, 1989-90

Districts	ASF Wheat OY (1989)	C.V. (%)	VMS Wheat OY (1989)	% Diff. ASF VMS	ASF Wheat (1990)	C.V. (%)	VMS Wheat OY (1990)	% Diff. ASF VMS
Faisalabad	3,536	6.3	2,197	37.87	2,736	7.9	1,949	28.76
Jhang	2,992	5.7	2,101	29.78	2,640	7.7	1,935	26.70
Multan	3,142	6.4	1,894	39.72	2,331	8.9	1,884	19.18
Sheikhupura	3,085	7.4	2,013	34.75	2,497	7.1	1,872	25.03
Nawabshah	3,748	6.7	2,798	25.35	2,214	9.7	2,585	-16.76
Larkana	2,086	8.2	1,643	21.24	960	10.8	1,568	-63.33
Hyderabad	3,654	7.2	2,407	34.13	2,544	8.3	2,375	6.64
Punjab (4 Districts)	3,170	3.3	2,047	35.42	2,550	4.0	1,910	25.09
Sindh (3 Districts)	3,363	4.0	2,500	25.66	2,130	6.2	2,367	-11.14
Pakistan (7 Districts)	3,178	2.6	2,155	32.20	2,448	3.4	2,020	17.50

ASF Area Sampling Frame
VMS Village Master Sampling
Source: Ninth Meeting of ADC's Technical Committee Working Paper on Agenda Item II - Review of the Results of Surveys/Studies, Peshawar, June 1991, p. 21.

ANNEX 12G: KHARIF RICE & COTTON OBJECTIVE YIELD (Kg./Hect.)
COMPARISON ASF VS VMS BY DISTRICT, 1989-90

Districts	ASF Rice OY (1989)	C.V. (%)	VMS Rice OY (1989)	% Diff. ASF VMS	ASF Cotton OY (Lint) (1989)	C.V. (%)	VMS Cotton OY (Lint) (1989)	% Diff. ASF VMS
Faisalabad	2,258	8.0	1,219	46.01	643	11.8	459	28.62
Jhang	2,609	10.8	1,171	55.12	346	10.9	503	-45.38
Multan	**		1,426		650	11.8	737	-13.88
Sheikhupura	2,633	6.3	1,043	60.39	**		180	
Nawabshah	5,186	5.3	1,195	76.96	601	7.7	419	30.28
Larkana	5,383	8.4	2,855	46.96	**			
Hyderabad	3,772	9.2	1,096	70.94	773	37.0	375	51.49
Punjab (4 Districts)	2,601	5.1	1,086	58.23	577	9.0	662	-14.74
Sindh (3 Districts)	5,162	6.9	2,601	49.62	651	13.8	402	38.21
Pakistan (7 Districts)	3,710	4.6	1,738	53.14	594	7.6	586	1.34

** No Sample selected due to small acreage
ASF Area Sampling Frame
VMS Village Master Sampling
Source: Ninth Meeting of ADC's Technical Committee Working Paper on Agenda Item II - Review of the Results of Surveys/Studies, Peshawar, June 1991, p. 9.

ANNEX 12H: KHARIF RICE & COTTON OBJECTIVE YIELD (Kg./Hect.) COMPARISON ASF VS VMS BY DISTRICT 1990-91.

Districts	ASF Rice OY (1989)	C.V. (%)	VMS Rice OY (1989)	% Diff. ASF VMS	ASF Cotton OY (Lint) (1990)	C.V. (%)	VMS Cotton OY (Lint) (1990)	% Diff. ASF VMS
Faisalabad	2,408	7.2	1,138	52.74	431	16.1	477	-10.67
Jhang	2,817	7.5	1,150	59.18	460	10.4	551	-19.78
Multan	**		1,371		668	6.4	830	-24.25
Sheikhupura	2,638	5.8	1,051	60.16	**		169	
Nawabshah	4,661	7.8	1,229	73.63	426	7.3	435	-2.11
Larkana	4,995	7.2	2,890	42.14	*			
Hyderabad	3,432	8.1	1.129	67.10	559	4	337	39.71
Punjab (4 Districts)	2,656	4.6	1,078	59.40	596	5.3	744	-24.86
Sindh (3 Districts)	4,719	6.0	2,647	43.90	474	4.5	398	15.96
Pakistan (7 Districts)	3,586	4.0	1,829	49.01	566	4.3	648	-14.57

** No Sample selected due to small acreage
ASF Area Sampling Frame
VMS Village Master Sampling
Source: Ninth Meeting of ADC's Technical Committee Working Paper on Agenda Item II - Review of the Results of Surveys/Studies, Peshawar, June 1991, p. 12.

ANNEX 12I: WHEAT OBJECTIVE YIELD (Kg./Hect) COMPARISON ASF VS VMS BY DISTRICT, 1990-91

Districts	ASF WHEAT OY						VMS	% Diff.
	Plot 1 (1991)	C.V. (%)	Plot 2 (1991)	C.V. (%)	Plot 1&2	C.V. (%)	Wheat OY (1991)	ASF Plot 1&2 VMS
Faisalabad	2,606	6.6	2,318	6.8	2,460	6.0	1,911	22.32
Jhang	2,267	7.9	2,313	8.0	2,280	6.9	1,955	14.25
Multan	2,527	8.4	2,506	7.7	2,518	7.3	1,844	26.77
Sheikhupura	2,610	7.7	2,290	6.6	2,428	6.7	1,803	25.74
Nawabshah	3,321	6.6	3,303	5.7	3,319	5.8	2,695	18.80
Larkana	1,330	8.30	1,347	9.9	1,324	8.4	1,614	-21.90
Hyderabad	3,880	6.0	3,982	6.0	3,931	5.8	2,485	36.78
Punjab (4 Districts)	2,490	3.9	2,363	3.8	2,420	3.4	1,881	22.28
Sindh (3 Districts)	3,219	4.5	3,242	4.0	3,232	4.0	2,468	23.64
Pakistan (7 Districts)	2,651	3.1	2,557	2.9	2,600	2.7	2,064	20.62

** No Sample selected due to small acreage
ASF Area Sampling Frame
VMS Village Master Sampling
Source: Ninth Meeting of ADC's Technical Committee Working Paper on Agenda Item II - Review of the Results of Surveys/Studies, Peshawar, June 1991, p. 12.

ANNEX 12J: NATURE OF TRAINING, DURATION, FACILITIES AVAILABLE AND AVAILED.

Nature of Training	Duration	Availabale Facilities	Facilities Availed
Long-term degree	12-24 months	5	1
Long-term non-degree	9-12 "	13	4
Short-term non-degree	4-6 "	12	7
Short-term non-degree	3 "	2	2
Invitation travel	1-2 "	6	6

Source: Government of Pakistan, Performance Report of ADC Component of FSM Project, ADC Cell, FBS, Statistics Division, P-6.

ANNEX 12K: FOREIGN TRAINING PLAN UNDER THE AGRICULTURE SECTOR SUPPORT PROGRAM FOR PHASE II OF THE AGRICULTURAL DATA COLLECTION PROJECT WHICH ENDS IN JUNE 1994.

Training Field	Number of Participants	Length of Training Approximate Months
Survey Methods	6	3
Agri. Statistics	6	2
Computer Application	4	4.5
Costs of Production of Crops	5	2
Methodology of Harvest Prices	5	2
Estimation of Livestock Products and their costs of Production	5	2
Economic Data Systems	3	2
Agri. Statistics	1	24
Computer Schemes	1	24
Objective Yield Study Tour	6	1

Source: ADC Seventh Year Work Plan July 1991-June 1992 prepared by ADC Cell/FBS, ADC Project Staff, Peshawar, June, 1991, p.11.

ANNEX 12L: SUBJECT MATTER AND NUMBER OF TRAINING AND NUMBER OF PARTICIPANTS

Training Course/Workshop/Seminar Subject Matter	No. Conducted	No. of Participants
Micro Computer Applications Seminar for Managers	3	34
Micro Computer Applications (Users training) Lotus 1-2-3, Word Processor, Software.	3	47
Application of Wordstar Professional Software.	6	82
Application of Package on Statistical Analysis System (SAS) for users.	3	56
Application of Software Package dBase-III.	1	15
Agricultural Statistics System.	3	47
Primary Data Collection and Questionnaire Designing.	1	21
Area Sampling Construction.	1	28
Application of Software Lotus 1-2-3.	5	49

Source: Government of Pakistan, Performance Report of ADC Component of FSM Project, ADC Cell, FBS, Statistics Division, P-7.

ANNEX 12M: DISTRIBUTION OF ACTIVITIES OF SHORT-TERM CONSULTANTS

Category	Subject	No. of Person-Days	%
Initiate Project		39	3.62
Administrative (OICD)		28	2.60
	PASA funding mechanism	10	0.98
	AID/ADC/OIC business	18	1.67
Administrative (NASS)		83	7.71
	Support for Resident Advisors	22	7.71
	Prec. work for new agreement	61	5.67
Training		630	58.00
	ASF construction	110	10.21
	Statistics short course	202	18.76
	Intro micro-computer workshop	36	3.34
	Main frame SAS	33	3.06
	PC SAS	46	4.27
	Primary data collection	118	10.96
	Digitization	41	3.81
	Spot stratification	44	4.09
Consulting		284	26.37
	Assembling micro-computers	14	1.30
	Agriculture prices study	38	3.53
	Aco methodology review	124	11.51
	Computer programming for ADC	21	1.95
	Computer mod & exp. study	13	1.21
	SD crop estimates	26	2.41
	Objective yield review	18	1.67
	Wheat obj. yield research	30	2.79
Sampling	Selected ASF sample	13	1.21
	TOTAL	1077	100.00

Source: Agricultural Sector Support Program, Agricultural Data Collection Component Quarterly Reports, January 1 -- March 31, 1991.

ANNEX 12N: ADC FOREIGN SHORT TERM CONSULTANT REQUIREMENTS FOR JULY 1991 -- JUNE 1992.

Expected Dates	Number of Consultants	Purpose of Consultancy
November 1991	1	Write program to summarise data from Provincial ASF Surveys.
Apr. 24 - May 8, 1992	1	Participate in wheat validation survey.
Apr. - May 1992	1	Select ASF Sample for Punjab and Sindh and review national sample size.
March 1992	2	Conduct economic data systems course.

Source: ADC Seventh Year Work Plan, July 1991 - June 1992, prepared by ADC Cell/FBS, ADC Project Staff, Peshawar, June, 1991, P.12.