

- PN-1185-825
15th 90709 -

**FARMING SYSTEMS RESEARCH
AND
NARC MASTER PLAN
IMPLEMENTATION**

REPORT - I

- **ACCOMPLISHMENTS**
- **ISSUES**
- **RECOMMENDATIONS**

by

**Dr. Murray D. Dawson
Farming Systems Research Consultant
July 1990**

PARC • USAID • MART • WINROCK

FARMING SYSTEMS RESEARCH

AND

NARC MASTER PLAN IMPLEMENTATION

REPORT - I

- ACCOMPLISHMENTS
- ISSUES
- RECOMMENDATIONS

BY

Dr. Murray D. Dawson
Farming Systems Research Consultant

July 1990

PARC ● USAID ● MART ● WINROCK

The MART (Management of Agricultural Research and Technology) Project is funded by the United States Agency for International Development (USAID). The MART Project's chief link to the Government of Pakistan is through the Pakistan Agricultural Research Council (PARC). A MART Project Coordination Committee composed of federal, provincial, and university representatives coordinates and guides project activities. Its purpose is to assist the Pakistani agricultural research system to strengthen its research management capabilities, and to improve communications, training, farming systems research, arid zone research, and research in the rural social sciences. Winrock International, through a contract with USAID, has responsibilities to assist with the first four of these tasks. Two international agricultural research centers, the International Maize and Wheat Improvement Center (CIMMYT) and the International Center for Agricultural Research in Dry Areas (ICARDA), are responsible for the other two tasks.

The mission of Winrock International Institute for Agricultural Development is to help reduce poverty and hunger in the world through sustainable agricultural and rural development. Winrock International assists people of developing areas - in Asia, Africa and the Middle East, Latin America and the Caribbean, and the United States - to strengthen their agricultural institutions, develop their human resources, design sustainable agricultural systems and strategies, and improve policies for agricultural and rural development. As an autonomous, nonprofit organization, Winrock International provides services independently as well as in partnership with other public and private organizations. The institute is recognized as a private voluntary organization.

C o n t e n t s

	Pages
PREFACE	i
EXECUTIVE SUMMARY	ii
1.0 INTRODUCTION AND BACKGROUND	01
2.0 CONSULTANT'S WORK PLAN	03
2.1 Implementation of Stage I of NARC Research Master Plan	03
2.2 FSR Program Development and Institutionalization	04
2.3 MART/PARC/USAID	05
3.0 ACCOMPLISHMENTS AND OUTPUTS	06
3.1 NARC Research Master Plan Implementation	06
3.2 FSR Institutionalization and Program Monitoring	06
3.2.1 Proka/Shahkot (Punjab)	06
3.2.2 Mansehra (NWFP)	07
3.2.3 Hala/Tando Mohammad Khan (Sindh)	08
3.2.4 Kanak (Balochistan)	10
3.2.5 Fatehjang (NARC) FSR Women Program	10
3.2.6 FSR AV Module Production	11
3.2.7 PARC Chairman's Guidelines and Decisions	11
4.0 ISSUES AND RECOMMENDATIONS	12
4.1 NARC Master Research Plan Implementation - Stage I	12
4.2 FSR Programs and Institutionalization	15
4.3 FSR Training and Productivity Goals	22
5.0 GENERAL OBSERVATIONS AND RECOMMENDATIONS	25
Annexure-1:	FSR Consultant's TOR
Annexure-2:	NARC Master Plan Implementation Suggested Format for Project Proposals
Annexure-3:	Summary of Recommendations in "Assessing the Impact of FSR in Pakistan" Robert Hudgens & Marlin Van Der Veen
Annexure-4:	NARC Master Plan Implementation: Stage 1 Issues and Decisions
Annexure-5:	FSR Constraint Diagnosis, Interventions and System Interactions
Annexure-6:	FSR Newsletter
Annexure-7:	Illustrative NARC Collaborative Research Programs First Stage Implementation
Annexure-8:	Proposed FSR Budget Allocations 1990-94
Annexure-9:	Indicators of Achievement for Assessing FSR Projects

P r e f a c e

During the period 1983-March 1990 the consultant was supported by two PARC/USAID Projects aimed at strengthening the national agricultural research system of Pakistan. Preparation for the inauguration of National Agricultural Research Centre (NARC), development of research programs and establishment of support services provided a challenging schedule for the first three years. Since 1987 under MART Project the consultant's twofold mission has been to assist in development and implementation of the NARC Research Master Plan 1988-2000 and the Farming Systems Research program.

It has been a grand opportunity and pleasure to return to Pakistan for six weeks beginning May 25, 1990 to work with the Chairman and Members of PARC, its administrators and agricultural scientists throughout the country in advancing research at NARC and FSR throughout Pakistan. The consultants End of Tour Report not merely cited accomplishments but identified unresolved issues and provided recommendations for follow-up action. This short consultancy has been devoted to addressing these issues.

Many scientist colleagues in the provincial institutions and at NARC have assisted in both the institutionalization of FSR throughout the country and in implementing stage I of the NARC Research Master Plan. The consultant particularly recognizes the support given by the PARC Chairman, Dr. Ch. M. Anwar Khan, PARC Members, senior NARC scientists Dr. N. I. Hashmi, Dr. A. A. Hashmi et al. The Provincial FSR Coordinators and their interdisciplinary teams working under the outstanding leadership of National FSR Coordinator Dr. Abdul Majid have largely contributed to accomplishments mentioned in this report.

The MART staff provided excellent assistance and their role is appreciated.

The consultant also thanks USAID/ARD officials for their continued support and encouragement.

Executive Summary

Important recommendations presented by Guy Baird concerning implementation of the NARC Research Master Plan and by Bob Hudgens/Van Der Veen on Assessing the Impact of FSR have been further developed in this report. Strategies to advance stage-I of the Master Plan implementation and institutionalization of FSR throughout the national agricultural research system have been defined. Issues and recommended action by administration and scientists have also been articulated.

Guidelines provided by the Chairman, PARC together with formats, procedures and examples of collaborative programs provide the NARC Technical Work Groups and Research Committee a challenge in setting the research agenda for 1990-91. Allocation of scientists' time, operational budget and support services on a project basis is discussed. This enables analysis of manpower and budget allocations based on individual commodities, disciplines and functional units. The concept of quantifiable progress, including marketable products, can be monitored by a revitalized Program Research Monitoring Cell (PRMC).

Accomplishments in FSR institutionalization and program performance at NARC and in all provinces is assessed. Field visits with FSR teams followed by scrutiny of proposed work plans and budgets prompted the identification of several important recommendations for program changes. Impact studies, and FSR training need a more rigorous effort to focus on important interventions. Also considered were strategies to advance the FSR women's program based on the Fatehjang experience and to complete a series of FSR A/V Technical Modules. Plans to strengthen linkages with extension, adaptive research and the private sector during 1990-91 are outlined.

The foundation has been laid for FSR to realize its potential in Pakistan. Greater integration of FSR into all parts of the research system with rather drastic changes in University teaching and curricula will be needed. Institutionalization of

FSR requires that it find a place in the context of the entire research system. The NARC, the Agriculture University, Faisalabad and the Ayub Agricultural Research Institute, Faisalabad could together provide the model.

The importance of good project management, motivated scientists and the usefulness of an FSR Coordination Unit is discussed, as the FSR approach is applicable not only to research/extension but also to soil fertility and plant breeding. Incentives are needed for scientists who focus their efforts on farmer problems and work with farmers in their solution. This means system orientated inter-disciplinary studies and improved communication across commodity research programs. An FSR coordination unit will be needed, partially to conduct research but primarily to act as a forum for bringing together institution researchers in different disciplines and commodity groups.

1.0 INTRODUCTION AND BACKGROUND

Making agricultural research relevant and clearly focussed to better serve the farmer are shared concerns of PARC and the MART Project. This consultancy report addresses progress in the development of NARC as a centre of excellence in agricultural research and in achievements to institutionalize Farming Systems Research throughout Pakistan's National Agricultural Research System.

The two-fold purpose of the consultancy was to:

- Assist PARC Chairman, PARC Members and NARC scientists define procedures, articulate issues, communicate and implement stage I of NARC Research Master Plan 1988-2000 based on Dr. Guy Baird March 1990, report; and
- Collaborate with Federal and Provincial agricultural scientists in the institutionalization of FSR programs such that committed sustained resource support is assured.

Initially the consultant met with PARC Chairman, PARC Members, National FSR Coordinators, senior NARC scientists and USAID representatives. This was followed by systematic visits to University Vice Chancellors, Directors General Agricultural Research, Agricultural Department Secretaries and agricultural scientists in each province. The FSR Coordinator, a Pakistani, accompanied the consultant in most of these visits.

A report by Robert E. Hudgens and Marlin Van Der Veen entitled "Assessing the Impact of Farming Systems Research in Pakistan" identified numerous deficiencies or weaknesses in the present FSR program and provided recommendations.

In addition to first hand knowledge/discussions with administrators and agricultural scientists, key reference material included:

- PARC Annual Budget 1990-91
- NARC Research Master Plan Implementation, Guy B. Baird -March 1990
- Institutionalizing FSR in Pakistan - M. Yousaf Chaudhry et al. - May 1989
- End of Tour Report, M. D. Dawson - March 1990

The report is in response to the terms of reference set out in Annexure-1 and is made up of the following sections:

1. A work plan to advance progress in NARC Research Master Plan implementation and FSR program development.
2. Accomplishments and outputs in NARC Research Master Plan implementation and FSR institutionalization and training.
3. Issues and recommendations to achieve NARC Research Master Plan implementation and FSR goals.
4. Overall observations for strengthening research and development linkages.

2.0 CONSULTANT'S WORK PLAN

In consultation with Chairman, PARC, National FSR Coordinator and USAID the following strategy and schedule was formulated:

2.1 Implementation of Stage-I of Master Plan

In order to systematically address the recommendations presented in the Baird Report, administrative decisions on further prioritizing of research projects and criteria to assess project proposals were required. PARC Members and senior NARC scientists were consulted in this exercise. For prompt program/project scrutiny and action on Technical Working Groups and Research Committee recommendations the Chairman has approved specific guide-lines together with a summary of administrative decisions. (3.2.7)

A project proposal format is given in Annexure-2.

A synopsis of the Baird Report inputs/outputs for all 1990-91 research project proposals is given below.

A. Inputs:

A project budget is needed with details of establishment (staff), operational and capital requirements by year. When staff are working on more than one project, scientists' time and operational budget should be allocated on a project-wise basis. This would enable analysis of manpower and budget allocations based on individuals commodities, disciplines, etc.

The inputs required to carry out the proposed project should be specified in terms of staff, facilities, equipment and supplies. The project requirements under the specific headings listed below should be clearly stated:

- Audio-Visual Communication
- Books, Publications and Documentation

- Central Stores
- Farm Operations and Services
- Transport Services including POL
- Automobile and farm machinery repairs
- Works, Repair and Maintenance Unit
- Laboratory Equipment and Maintenance
- Training

B. Outputs

These should be specified for each Project/ Program and in concrete terms (information, technology, publications, etc.). Quantifiable progress indicators should be listed for each planned output. One of the indicators should be a marketable product. Indicators will serve as tangible steps towards progress during the course of the research. The proposal should show that the scientist is fully aware of what the research product will be and how it will be utilized. Opportunities should be given for meaningful collaboration with other individuals and institutions engaged in related research. This may be with a view to achieving the needed interdisciplinary approach or working with the private sector.

2.2 FSR Program Development and Institutionalization

In collaboration with Dr. Abdul Majid, National FSR Coordinator, a schedule of meetings with scientists in each province was established. Field visits to each FSR Target Area and preliminary review of respective FSR Work Plans and budgets were carried out. Dr. Majid and his associates, Dr. Amanullah Cheema (Animal Scientist) and Dr. Mansab Ali (Agronomist) also participated.

Particular attention at each provincial meeting was given to the recommendations of the Hudgens and Van Der Veen, March 1990 consultancy report "Assessing the Impact of Farming Systems Research in Pakistan". A summary of their report and recommendations is given Annexure-3.

Procedures and progress in the institutionalization of FSR throughout the national agricultural research system were reviewed in each province. Commitment of resources by institutions and preparation of PC-1 for FSR sustained support for each province are in various stages of completion. Strategies to complete PARC PC-1 which provides resource support through MART Project funds and GOP development budget are well advanced. The FSR program continues to explore strengthening linkages with other agencies in the public and private sector. A format to develop and disseminate A/V Technical Modules which feature farmer validated improved technologies has been jointly prepared by FSR and Communications components of MART Project.

2.3 MART/PARC/USAID

The MART Project consultants remain alert to activities which enhance the overall performance of agricultural research and education. For instance on request by Chairman, PARC the FSR consultant has assisted a New Zealand Technical Assistance team in a study which may result in collaborative systems research involving livestock and horticulture.

3.0 ACCOMPLISHMENTS AND OUTPUTS

3.1 NARC Master Plan Implementation

Recommendations on action for implementation of stage-1 of the Master Plan, based on consultations with NARC senior scientists and discussions with PARC Members are given in Annexure-4. Administrative issues, resetting research priorities and research management items upon which action has been taken during June 1990 are as follows:

3.2 FSR Institutionalization and Program Monitoring

3.2.1 Proka/Shahkot (Punjab)

Field visits and discussions were conducted by FSR Coordinator's Team and Advisor in Lahore (June 4) and Proka/Shahkot (June 11-12):

A strategy to involve extension and adaptive research in the FSR/Punjab was discussed with Ch. Ghulam Mohammad, Director, Agriculture Extension (Headquarters). Two workshops are planned.

The status of FSR in Proka and Shahkot is as follows:

- Irrigation support at Proka has been inadequate but Dr. Hanjra reports contacts have been made to rectify this problem.
- Fodder seed of SS hybrid is available from the private sector. Egyptian Clover production and livestock feeding improved practices are being taken up by farmers.
- Urea treated straw technology has been taken up by over 20 farmers. This technology appears attractive to farmers for fodder shortage periods (May-Jun, Dec-Jan).

- Studies will be initiated (student theses) to assess improved technology adoption/non-adoption by farmers (Impact and Reasons).

3.2.2 Mansehra (NWFP)

The field trip and discussions at Mansehra resulted in the following observations/decisions:

Item-1: FSR Impact Study of Mansehra Target Area

1. The Agricultural University will support an immediate study of the impact FSR has had in the Mansehra Target Area including:
 - Farmer adoption/non-adoption of improved technology (with reasons).
 - Effect of FSR on institutional research planning and performance and university-based participation/linkages with FSR.
2. The Vice Chancellor will discuss with Dr. Jan Baz his leadership role in the FSR Impact Study of Mansehra.
3. A proposed impact questionnaire was reviewed. Support from Agronomist (Fazal Hayat Taj) and Animal Scientist (Dr. M. Aftab Khan) to conduct the study is under study by the University.

Item-2: Institutionalization of FSR in NWFP

1. The Vice Chancellor Dr. A. Rahman Khan requested Dr. Rauf Khattak to provide him names of scientists who may be assigned to the FSR program. A broader University base in FSR project is to be achieved.

- b. FSR Sindh - overview, achievements and constraints - G. H. Memon/
Jim Barnett
- c. Expected outputs from the National FSR Workshops:
 - (1) Achievements
 - (2) System Focus
- d. (1) Institutionalization/PC-1
(2) MART Amendment
(3) Consultant Report - M. D. Dawson
- e. Work Plan/Budget 1990/91
- f. Training (Incountry/Abroad), Travelling Seminars.
- g. Other Business.

Review of FSR Consultant Report

Coordinator Dr. G. H. Memon and associates have agreed to prepare a procedural statement which details how Sindh province will:

1. Analyze each of the FSR Consultant recommendations.
2. Prioritize action and responsibilities.
3. Collaborate in a FSR National Workshop to debate implementation of the consultant recommendations.

Presentation of FSR Work Plan and Budget

Each FSR component intervention should:

1. State problem addressed by the intervention.
2. Show where the intervention fits into the system.
3. Indicate major changes in the system which will result from the interventions (Annexure-5).

All scientists work plans will indicate what measurements/ observations will be made to assess their system interventions, interactions on land (soil and water), labor, livestock and cash flow, over time. The 1990-91 FSR thrust should aim at developing and testing models of aggregated FSR interventions.

3.2.4 Kanak (Balochistan)

The NARC FSR Coordinator Team with Advisor participated in a field trip to the Kanak FSR Target area during June 26-28, 1990.

Observations and recommendations which emerged from the Field Trip and subsequent discussion are summarized in Section 4.2--Items 7-10.

3.2.5 Fatehjang - FSR Women Program

The June 1990 FSR Newsletter (see Annexure-6) provides accomplishments in the FSR women's program. Significant achievements in improved poultry husbandry and village grain storage through training are reported by Fatehjang rural women in the July 1990 FSR Newsletter.

3.2.6 FSR AV Module Production

Assignments related to collaborative FSR/AV module production are being jointly carried out by FSR scientists and communication specialists Drs. Anwar Hassan and J. Cordell Hatch. These include:

1. Urea Treated Straw - Dr. Asghar Jalis has produced an improved video for Urea Treated Straw together with a script for radio broadcasts.
2. What is FSR - Both video and audio versions of "What is FSR" have been produced by Dr. Jalis. The radio edition gives farmers' view point. Hatch suggests the script be done by 2 voices (speakers).
3. Scripts
 - Urea treated straw
 - What is FSR
 - SS Hybrid
 - Lentil/Mung
 - Silage

3.2.7 PARC Chairman's Guidelines and Decisions

1. Give 1990-91 budget for each defined FSR Target Area and state fund source.
2. Give NARC FSR Coordination Cell Posts 1990-94 with budget for each post and detail funding under MART and GOP operational budget.
3. Give NARC FSR Project Budget Statement with proposed operational expenses for each Federal/Provincial component through 1994. State funds source(s).

Chairman also approved in principle that:

1. FSR Coordination Cell with support staff be located in the new training A/V Communication Building.
2. FSR Coordinating Unit/ Cell include the following scientists/staff:
 - 1) Dr. Abdul Majid, National FSR Coordinator
 - 2) Dr. Mansab Ali, Associate Coordinator (Agronomy)
 - 3) Dr. Amanullah Cheema, Associate Coordinator (Livestock)
 - 4) Mrs. Bushra Tariq, Associate Coordinator (Women Component).
 - 5) Associate Coordinator (Social Sciences) (under appointment).
 - 6) Mr. Mumtaz Hussain, Stenographer

4.0 ISSUES AND RECOMMENDATIONS

4.1 NARC Research Master Plan Implementation - Stage I

Item-1: Project proposals should be on new formats:

Recommendations

1. As the approved project proposal format enables better formulation of work plans, and progress reports, and convenient conduct of monitoring and evaluation, the first work plan should be formulated in the format, stating objectives and work expected to be accomplished during 1-3 and 3-5 year periods.
2. Quantifiable progress indicators (interim objectives or outputs) should be articulated as well as plans to interact with prospective users of the outputs, and research collaborators.
3. The first progress report to the RMC should flow from the first work plan. This linking of key indicators/headings right from the approved proposal through work plans and progress reports is desirable for monitoring and evaluation.

Item-2: Develop the PRMC into an Effective Unit at NARC

Recommendations

1. Introduce the approved project formulation format (Annexure-2) as basis for reporting including:
 - Title
 - Reporting period
 - Objective(s)
 - Methodology/Approach - any comments on adequacy or in-adequacy or modifications
 - Progress toward achievements of outputs

- Progress toward utilization of anticipated inputs (e.g. interaction with expected users)
 - Collaboration, specify what has been done
 - Progress in provision of inputs
 - Provision of budget
2. Appoint short term consultant to assist in the development of the PRMC on guidelines based in the Baird Report.

Item-3: Incomplete Support Service Objective/Functions Noted in the Master Plan

Recommendation

Finalize the following support service statements:

1. Procurement Cell. Strengthen the working of this Cell by laying down specific needed procedures.
2. Farm Operations and Services. Require information on objectives and current and planned programs.
3. Works, Repair and Maintenance Unit and Laboratory Equipment and Maintenance Unit. Require concise statements of their purpose, functions and resource needs.
4. All support units should publish:
 - Name of the unit
 - Mandate: a clear, concise statement of its role as a support service to research
 - Current Status: a brief description of the program, staff and facilities.
 - Critical areas requiring development/ strengthening to meet needs of first stage implementation of the Research Master Plan indicating priorities
 - Operational Budget

Item-4: Priorities for NARC Training Institute

Recommendations

In concert with the Training Institute Staff the CSO (Research) and the CSO (Operations) will promptly develop the entire 1990-91 training institute workshop, seminar, conferences, schedule.

Note: Training Institute is designated as a national facility which aims to strengthen the manpower of the entire national agricultural research system.

Item-5: Collaborative Interdisciplinary Research Programs

Recommendations:

Research Committee should promptly recommend a few overall interdisciplinary collaborative research programs for the first 1-3 years (see Annexure-7). Each research program would be:

1. Interdisciplinary and involve basic, applied and system research project.
2. All research should indicate either generation or, development or transfer of specific technology:

Note: Priority to research projects of Master Plan that address approved 1st stage NARC selected projects is encouraged.

4.2 FSR Programs and Institutionalization

Item-1: Major Constraints/Priority Research

Recommendations:

The FSR teams at both Shahkot and Proka should urgently consider:

1. Initiating low cost land levelling and water use efficiency studies (under A. D. Chaudhry's supervision) with a cluster of cooperating farmers at both FSR sites at Shahkot and Proka.
2. Conducting prompt surveys on (both forage and cash crop) legume nodulation. A microbiologist and agronomist team should initiate inoculant studies based on thorough field surveys.
3. Monitoring adoption of improved fodder production and utilization by farmers in the FSR Target Areas. Mr. Younus, ARI and post graduates could conduct such an investigation.
4. Focussing research on problems such as delayed breeding, long interval calving, silent heat and low meat production from male cows under FSR/MART.
5. Doing of systematic soil analysis and occasional water analysis by the soil scientists. Special attention should be given to: (a) residual P, (b) Potash Status (especially sandy soils) and (c) establishing fertilizer levels based on soil test data.

Item-2: Accentuate the Systems Research Thrust

Consider interactions within the entire system (Annexure-5)

Recommendations:

1. All scientist work plans must indicate what measurements/observations will be made to assess their system interventions, interactions on land (soil and water), labor, livestock and cash flow, over time.
2. The 1990-91 FSR thrust should aim to develop and test models of aggregated FSR interventions.

- Example:*
- (a) Select 5 or 6 cooperative farmers at Proka and Shahkot. Test their Conventional Systems with Improved fodder/livestock husbandry practices (i.e. fodder, treated straw, silage, deworming being all aggregated).
 - (b) Develop, in concert with agricultural economists farm budgets based on inputs and output targets set by biological scientists.
 - (c) Proceed to keep accurate records and observations.
 - (d) Improved System Models can emerge which should be improved over time especially with the aid of computers.

Item-3 Strengthening FSR Linkages

The FSR Projects will be improved when closer partnership is developed among scientists, extension and private sector.

Recommendations: Initiate Two Workshops:

1. A) First Workshop as proposed by Punjab would focus on "Strategies to Accelerate Farmer Adoption of Improved Technologies Tested under FSR".

 B) Second Workshop would consider a position paper which provides a background statement and proposals to establish an integrated R&D project (coordinated through FSR/D) in a yet to be defined major rice-wheat system area.
2. Strengthen the FSR Scientists Resource Base at both the Agriculture University and AARI, Faisalabad with commitments (manpower facilities, operational budget) reflected in a PC-1.

Item-4 Apple Orchard Interventions

Recommendations

Dhodial scientists should concentrate on a selected portion of the Shiraz Mahmood Farm to develop a model of excellence in apple cultural practices (Dr. Daud will provide action plan details).

Item-5 Expanded FSR Technical Assistance in Selected Vegetables and Fruits

Recommendation

1. Horticulture has enormous potential in the Mansehra area. Dr. Daud's continued assistance in FSR (both training and research) deserves consideration.
2. Dr. Daud will review detailed work plan and Dhodial Experiment Station resource support for the 1990-91 apple orchard interventions prepared by Dhodial horticulturists.
3. During 1990-91 FSR NWFP should locate 6 cooperative farmer orchardists who will agree to initiate a limited defined acreage to test all inputs and management against farmer practices.
4. Initiate tests of various bird detractors on apple orchards. Calculate present economic loss of apples and gains through use of bird detractors.
5. Agronomic trials should be initiated on peas to study planting dates, intercropping and pest control in crop system trials.
6. Seed rate and agronomic trials, inter-cropping on improved lentil (Mansehra 89 - ICARDA Germplasm) should be initiated.

7. Intensify testing of pea variety trials of germplams supplied through Dr. Daud

Item-6 Report Writing: FSR Orchard/Pea Studies Strategies, Responsibilities and Target Dates

Recommendation

Dr. Daud will provide a detailed strategy to complete write up of all horticultural results carried out through his consultancy at Mansehra.

Item-7: Redefined and Prioritized Farmer Problems

The field trip to Kanak with FSR team on June 26-28 revealed an excellent response in farmers field from the potato interventions. Other issues were raised and recommendations emerged:

Recommendations

1. FSR Team should revisit Kanak to redefine key problems with farmer interviews and prioritize production constraints.
2. Since Water use efficiency is so important to all groups, key interdisciplinary interventions could be developed around a water use and management thrust.
3. Limit work plan to only 3 or 4 interventions each for Kharif and Rabi. A few good interventions replicated with 5 or 6 farmers is better than many poor executed complex studies.

Item-8: Improved interventions with a system focus and a High Certainty of Significant Economic Impact

Recommendations

1. Diagram accurately by month the major traditional cropping systems being used at present.

2. Sketch in on the figure precisely where, when and what system improved interventions are planned. Indicate in work plan measurements to be taken.
3. Animal scientists should team up with agronomists and agro-forestry scientists to prepare figures which illustrate for each month:
 - a) Feed sources, their location and feeding time(s) to livestock under traditional and present practices.
 - b) Superimpose planned feed and health interventions.
4. Make all livestock interventions, nutrition/feed orientated not breeding.

Item-9: FSR Training and Technical Assistant Needs

Recommendations

1. Invite Dr. Shahid and associates for a 3-day study (with Balochistan FSR and Water Management counterparts) to assess the irrigation problem and provide priority water use efficiency alternatives.
2. Similarly invite Dr. Daud to work with horticulturists in defining problems, selecting six cooperative orchardists and accurately designing study site with format for data collection. Focus on plant protection and pruning/training (Not more than 3 treatments in a package system intervention).
3. Arrange FSR workshops and short term training on above topics et al. for different groups i.e. (i) scientists/extension staff and (ii) farmers.
4. Animal Scientists and Agricultural Economist should also define training/workshops needs together with agro-forestry specialists.

Note: Topics, titles, dates/duration, course objectives, estimated budget for 3 & 4 above must be given FSR Coordinator Dr. Majid by July 5, 1990.

Item-10: Revise FSR Work Plan and Budget

Recommendations

1. Dr. A. H. Bajoi, Director, ARI, Sariat conduct meeting of Balochistan scientists before July 4, 1991 to revise work plans according to above recommendations of June 27th meeting.
2. Request Dr. Majid to review FSR work plan/budget in Quetta with concerned scientists before July 15, 1990.
3. Submit revised work plan/budget for approval July 16.

Item-11: Institutionalization of FSR in Sindh

Recommendations

1. Dr. G. H. Memon in collaboration with Dr. Jim Barnett will prepare a statement (hopefully to be approved in a PC-1) on how Sindh province or particularly, Sindh Agriculture University, Agricultural Research Institute et al. institutions intend to internalize FSR.
2. The above statement will include suggested/committed scientific and support staff, operational funds, facilities for FSR Coordination Unit necessary to sustain a vigorous FSR program in Sindh.

Item-12: FSR Work Plans 1990-91 to be Revised

Recommendations

1. The FSR team of scientists will revise their work plans to indicate system interventions and interactions. Diagrams/charts would be useful.

2. The FSR will focus on farmer testing of aggregated interventions (not more than 3) to test models of improved technology with a cluster (6) of farmers sharing similar circumstances.
3. Develop with assistance from Agricultural Economists farm budgets of present practices and synthesized budgets of expected input/outputs from improved systems.

Item-13 FSR Impact Studies and New Target Areas

Recommendations

1. The Sindh FSR team will present a strategy and work plan which articulates how, when and by whom an impact study at Hala and Tando Mohammad Khan can be conducted.
2.
 - a) The FSR team and Dr. Jim Barnett in collaboration with administration will consider opening up new FSR target areas in Sindh.
 - b) A strategy together with resource needs will be prepared necessary to implement any output under 1 and 2a.

4.3 FSR Training and Productivity Goals

Item-1 Consultant Hudgens/Van Der Veen Priorities

Recommendation

1. Agricultural University, Faisalabad should conduct a 3-day workshop for training trainers (from each province) in understanding the FSR approach and methodology.
2. Expand training in farm profitability and farm budgets based on the CIMMYT March 1990 Workshop.
3. Conduct transfer of technology seminars for extension policy makers.

Item-2 Farmer Perspective on Management Constraints and Adoption of Improved Technology

Recommendations

1. Initiate impact monitoring and research to determine reasons for farmer non-adoption of improved technology.
2. Conduct regular team exercises in diagnosis/farmer interviews to update knowledge of management constraints.
3. Develop standardized formats for FSR site coordinators to keep accurate management records.

Item-3 Modern Systems Teaching and Curriculum Update

Recommendations

1. Conduct key university administration and scientist workshops to explore FSR agricultural curriculum and teaching opportunities.

2. Conduct a FSR curriculum inter regional workshop with invited speakers from selected countries.

Item-4 Strengthen FSR Linkages with the Private Sector

Recommendations

1. Scientists prepare a one page statement relative to how respective research would benefit from teaming up with private industry representatives.
2. Invite private sector representatives to state how linkages can be strengthened between research and industry and what do private firms want from agricultural research?

Examples

- Farm Machinery - Special testing and adaptation of new machinery.
- Irrigation Equipment - The development and testing of improved sprinkler systems.
- Seed - The development and selection improved seed for:
 - i) vegetables
 - ii) fruit nursery (including nuts)
 - iii) oilseeds
 - iv) cereals
- Food Technology - Processing of selected fruits and vegetables.
- Animal Feed
 - i) the development of concentrates and feed mills for (both small and large) livestock and poultry.
 - ii) manufacture of vaccines and their testing.
- Biotechnology - Tissue culture for selected plants and possible embryo transfer in animals to upgrade livestock breeds.

- Agricultural Chemicals - Testing and selection of improved agriculture chemicals for weed and pest control.
- Fertilizer - More accurate assessment of plant food needs of selected crops on benchmark soils and testing new fertilizer products.

5.0 GENERAL OBSERVATIONS AND RECOMMENDATIONS

The Chairman's action to implement priority recommendations of the Baird NARC Master Plan report and those of Hudgens et al. in the FSR Impact Assessment is commendable.

Prescribed procedures in selecting research projects for first stage implementation have been articulated. The post of Director General, NARC has been advertised and a decision has been taken to appoint CSO (Research) and CSO (Operations). Guidelines to facilitate delegation of administrative authority have been developed.

Systematic and objective prioritizing of research projects with defined resource needs will challenge the capability of the Technical Working Groups and NARC Research Committees. The separation of NARC research from national coordination functions will help. The Research Committee may be encouraged to identify several interdisciplinary programs as priority NARC research thrusts. Inputs and outputs specified from basic, strategic and system focussed research scientists for each thrust should then be articulated.

Doubtless the development of an effective Research Monitoring Cell will assist management. The RMC could then signal required remedial action to scientists, support services or administration.

Provincial institutions and Federal agencies engaged in FSR have allocated staff, facilities and operational budget to support FSR. Evidence is in that FSR is being institutionalized. However, there remains an urgent agenda to encourage further institution resource (scientists, operational budgets, etc.) that positively institutionalizes FSR nationally. The FSR Coordination Cell at NARC has prepared a proposed FSR National Budget under the MART/PARC project for the period 1990-94 (Annexure-8). A sustainable FSR program in Pakistan with continued Federal and Provincial government support will require evidence of significant impact of improved productivity in both agricultural production and farm family income.

The foundation has been laid in Pakistan for FSR to realize its potential. Greater integration of FSR into all parts of the

research system with rather drastic changes in University teaching and curricula will be needed. Institutionalization of FSR requires for it to find a place in the context of the entire research system. The NARC and Agriculture University/AARI Punjab could together provide the model.

The FSR approach is applicable to research/extension from soil fertility to plant breeding. Incentives are needed for scientists at all levels who focus their efforts on farmer's problems and work with farmers in their solution. This means system orientated inter-disciplinary studies and improved communication across commodity research programs. Often a FSR coordination unit will be needed, partially to conduct research but primarily to act as a forum for bringing together institution researchers in different disciplines and commodity groups.

Issues of sustainability, resource conservation and a quality environment are unlikely to be addressed by ignoring the FSR experience. Both the short term goals for improving small farmer welfare and long term goals for sustained productivity are important in conducting FSR projects. Indicators of achievement for assessing FSR projects and monitoring performance have been prepared (Annexure-9).

Terms of Reference
for
FSR Consultant

Based on discussions with Chairman, PARC, USAID and MART Project colleagues the FSR Consultant will address the following duties/responsibilities May 24 through July 3, 1990:

1. Develop the institutionalization of FSR programs and encourage institutional resource allocation in partnership with provincial institutions and PARC.
2. Assist in development and approval of FSR Work Plans and budgets for 1990/91 with provincial scientists.
3. Monitor and assess MART short term consultants Ms. Bushra and Dr. Daud's FSR activities.
4. Collaborate with MART supported communication specialists and FSR scientists in completing A/V technical modules.
5. Assess progress and advance implementation of Stage-I NARC Master Research Plan.
6. Prepare training, seminar, workshops and develop future technical assistance needs in Systems Research.
7. Strengthen research/development linkages with the private sector.

NARC: Master Plan Implementation
Suggested Format for Project Proposals

1. **Title**
The title should be short and concise, reflecting the principal objective of the proposed research.
2. **Objective(s)**
The objectives should be sharply-focused, lending themselves to measurement of progress during the course of the project, and quantification at the end of the project.
3. **Problem**
A clear statement of the problem to be addressed by the proposal. How important is the problem?
4. **Previous and Present Work**
Make clear what has been and is being done about the problem, both inside and outside of Pakistan. From this review it should follow what additional information or technology is required.
5. **Methodology/Approach**
Describe how the additional information or technology will be achieved or realized.
6. **Specific Outputs (Products) Anticipated**
These flow from the objectives. State specific expected outputs for each objective. Specify in terms of information, technology, publications, etc. expected with a) 1-2 years and b) 3-5 years. List progress indicators for each output.
7. **Utilization of Outputs**
Provide particulars of intended users of outputs, and what will be done to encourage utilization. Specify whether users are in public or private sector.
8. **Collaboration**
Mention specific intended collaborators and nature of collaboration: a) within NARC, b) PARC and other institutions within Pakistan, and c) with institutions outside of the country. Specify any private sector collaboration.
9. **Inputs Requirement**
Include, and quantify to extent possible staff, (scientific, support), facilities (laboratory space, field space, etc.)
10. **Budget**
Provide budget by year showing detailed estimated staff, operational and capital costs.

SUMMARY OF AND RECOMMENDATIONS IN
"Assessing the Impact of FSR in Pakistan"
by
Robert Hudgens & Marlin Van Der Veen

SUMMARY

1. Little attention has been given to understanding why improved technology packages have not been previously adopted by farmers.
2. Much more research is needed on barriers to adoption for low resource farmers.
3. The effect of individual package components (e.g. fertilizer, planting density, or deep ploughing alone), and the interaction of components within a package should be examined.
4. The participation of the agricultural extension service in FSR is severely lacking in the provinces. Extension and particularly adaptive research involvement in FSR remains an urgent need.
5. Farmer participation also appears limited to survey responses. Decisions on research priorities seldom included farmer perspectives on management constraints, and feedback from farmers concerning trial results was inadequately collected and reported.
6.
 - a) More investment must be made in FSR training (whole farm budgeting, stability analysis, problem prioritization).
 - b) Understanding of FSR concepts and procedures, as well as a general acceptance of its usefulness is lacking. The focus should be on in-service training and university curriculum revision.
7. Studies for relaying information to policy makers. PARC should consider setting up mechanisms for integrating compatible elements of Adaptive Research and Barani Agricultural Research and Development (BARD).
8.
 - a) Projects require additional operational and training funds.
 - b) PC-1 for each province with national coordination through PARC is essential to ensure the continued effort to build a successful, effective and more comprehensive FSR program in Pakistan.

RECOMMENDATIONS

1. A "manpower development plan" should be prepared by the National and provincial coordinators during the first quarter of 1990 to delineate immediate and long term FSR training needs.
2. All FSR scientists and graduate students should take in-service short courses to acquaint them with a basic understanding of FSR concepts and methodologies, including:
 - Farming Systems diagnosis
 - Experimental design
 - Farm case studies
 - Pilot production activities.
3. FSR subject matter should also be incorporated into the agricultural university curriculum in each province. An introductory level course on the basic FSR approach should be offered at the undergraduate level. Graduate courses in FSR experimental design and data analysis can be tailored to specific disciplines.
4. Study tours to advanced FSR projects in nearby Asian countries should be arranged for the FSR Coordinators. Study tours should be offered once per year. FSR projects in Nepal and Indonesia should be considered initially.
5. a) A workshop should be organized by the National FSR Coordinator to standardize the format used by FSR Site Coordinators. Emphasize principal farming systems and identification of research priorities. Identification of research priorities from the standpoint of farm management constraints should receive attention.

b) Before in-service training can be launched, appropriate training materials must be developed. It is the role of the National FSR Coordinator to collect, assess, and modify international training materials.
6. Impact monitoring. The "National FSR Monitoring Team" should begin annual assessments of FSR activities in selected provinces. Feedback on inter-commodity linkages and any remedial actions in management will be reported. The monitoring team should be invited to attend the annual planning review meetings of FSR.
7. Integrating parallel projects. Adaptive Research programs and the Barani Agricultural Research and Development (BARD) project should be integrated with the nationally coordinated FSR program.

8. Additional resource support. A PC-1 for FSR should be developed by each province. The PC-1 should request PARC funding for the National FSR Coordinator, traveling seminars, annual planning meetings, and publications from both federal and donor agencies.

The NARC Master Plan Implementation : Stage I
(Issues and Decisions)

Introduction

The infrastructure at NARC has developed into a highly complex organization. At present there are some 57 research programmes/projects undertaking research on various distinct or inter-linked areas of Crop Production, Crop Protection, Agro-forestry, Farm Machinery, Natural Resources, Livestock and Fisheries with excellent facilities for laboratory and field experimentation. Out of a team of about 331 scientists 51 are Ph.D. 237 M.Sc. and 43 B.Sc. several more foreign trained scientists are likely to join the organization in the coming 2-3 years.

In order that the human, capital and physical resources are effectively and optimally utilized, administration, planning, executing and monitoring of research at NARC requires that NARC develop:

1. A research style suited to the national needs yet commensurate with available resources.
2. Motivated scientists at all levels and encouragement to groom the emerging dynamic leadership.
3. Research output that is consistent with GOP policy and socio-economic changes.
4. Scientific technical and management capabilities and high standard performance.
5. Strengthened internal and international linkages with the research community in both the public and private sectors.
6. A regular system of responsibility and accountability at all levels of scientists and support staff.
7. Effective support services that encourage research excellence.

Recommendations articulated in the consultant (Dr. Baird) report concerning Master Research Plan Implementation Strategies demands urgent action. However, all recommendations cannot be implemented at once. Priorities must be set. In consultation with NARC senior scientists and discussions with members, first stage action and implementation of the NARC Master Plan recommendations is presented.

Item-1: Strong DG Placed at NARC with two CSOs

Decisions:

1. PARC should proceed with the appropriate process of advertisement and selection for a Director General, NARC.
2. The appointment of Chief Scientific Officer (Research) and Chief Scientific Officer (Operations) will be made in the very near future. [see Appendices 1&2 for scope, duties and responsibilities (TOR)].

Item-2: Delegation of Administrative and Financial Authority

Decision

1. Research: Only policy matters, research planning together with guidelines for research will be a concern of each Member and informal monitoring of research progress by the concerned Member (s) will continue.
2. Management: Authority, responsibility and accountability will be delegated to all functional units effective July 1990. Normally these will be research program/discipline leaders.

Item-3: Resetting Research Program/Project Priorities

Decision:

Priority Research Projects for NARC: TWGs and Research Committee will prepare research list of only NARC Research. Prioritize the research list based on Master Plan updated by PARC/GOP guidelines. Prioritization criteria is attached (Appendix-3).

Item-4: Resource Allocation to Priority Research

Decisions:

1. Chief program/project leader will state scientists manpower allocation, operational budget, training and facility needs.
2. Program and project leaders will state 1-3 year expected achievements or outputs.

Item-5: Collaborative Interdisciplinary Research Programs

Decisions:

Research Committee should promptly recommend a few overall interdisciplinary collaborative research programs for the first 1-3 years. Each research program will be:

1. Interdisciplinary and involve basic, applied and system research project.
2. All research should indicate either generation or, development or transfer of specific technology:
3. Priority research projects of Master Plan that address approved 1st stage NARC selected programs is encouraged.

Item-6: Research Monitoring Cell

Decision:

This Cell hereinafter shall be named Research Monitoring Cell (RMC).

1. The RMC leader (CSO) will be appointed in July 1990.
2. A statement by RMC Director will be made relative to responsibilities, facilities and support staff and training needs.
3. A Short term consultant to assist RMC develop measurable performance and achievement indicators for both research and support services and effective smooth management of RMC will be appointed during 1990.

Item-7: Training at NARC

Decisions:

1. In concert with the Training Institute staff CSO (Research) and CSO (Operations) will promptly develop the entire 1990-91 training institute workshop/seminar/conferences schedule.
2. Training Institute is designated as a national facility which aims to strengthen the manpower of the National Agricultural Research System.

**NARC CHIEF SCIENTIFIC OFFICER (RESEARCH)
SCOPE AND DUTIES & RESPONSIBILITIES**

I. SCOPE

The Chief Scientific Officer (Research) will be responsible to Director General, NARC. His aim is to minimize resource duplication yet maximize interdisciplinary research activities that translate land, facilities, scientific and support staff acumen into products and or services that benefit the rural community.

II. DUTIES AND RESPONSIBILITIES

Assist Director General NARC to:

1. Organize research on the basis of multidisciplinary programs, consistent with NARC objectives, while maintaining scientific integrity of subject matter disciplines;
2. Strengthen linkages through PARC among research institutes and universities in the national agricultural research system and the private sector, minimize duplication and maximize manpower productivity in solving prioritized farmer problems.
3. Develop a format procedure at NARC for research proposals and review in which responsibilities are clearly stated and criteria for prioritization of projects and allocating resources are articulated.
4. Develop a sound technical and financial monitoring and evaluation system for NARC research projects, in collaboration with Director of PRMC.
5. Improve internal communication so that the NARC/PARC members and information officers are kept updated on research achievements, constraints and important new researchable areas.
6. Strengthen the working relationship with information specialists to obtain advice in the transfer of significant research findings and to utilize the most suitable communication media for different target audiences.
7. Improve the exchange of scientists, information and germplasm among institutes within country and abroad and keeping the donor agencies well informed of the research "pay offs".

8. Look-after the duties of DG, NARC when the Director General is absent or indisposed.

**NARC CHIEF SCIENTIFIC OFFICER (OPERATIONS)
SCOPE AND DUTIES & RESPONSIBILITIES**

I. SCOPE

The Chief Scientific Officer (Operations) will be responsible to the Director General, NARC. His objectives will be:

1. Supervision, direction and coordination of support services.
2. Policy and procedures for support service staff and their appointment (Grades 13-14) and development.
3. Building and grounds repair and maintenance services with supervision of central Motor Pool system.

II. DUTIES AND RESPONSIBILITIES

Assist DG/NARC with respect to:

1. NARC support services including: farm services, repairs and maintenance (buildings and grounds), Training Institute, information and communications.
2. Staff appointments in Grades 1-12 to support service posts, establishment of work plans for specific posts and career development schemes.
3. Performance monitoring of support staff according to established work plans and behavior objectives in collaboration with Director PRMC.
4. Developing effective NARC support services to strengthen the national agricultural research and education system.
5. Developing a personnel unit within administration to guide research and operations establish consistent and uniform policies/procedures in personnel records (appointment, promotion, discipline, etc.)
6. Establishing a budget management and control system for NARC which:
 - (a) Provides researchers the use of budget as an instrument in planning and managing research projects;

- (b) Delegates authority to program leaders but maintains central control; and
 - (c) Identifies staff and facility needs to effectively carry out budgetary functions as above.
7. Preparing work plans for a NARC Accounting Unit which performs functions and relieves scientists of burdensome functions of fund disbursement, travel arrangements and other routine chores.
8. Supervising Central Stores and staff to maintain:
- (a) A stock of commonly used supplies, materials and parts;
 - (b) A central procurement service capability and a system of requisition charged against a Research Unit (Sector) requests;

Listing of Proposed Projects for Master Plan Implementation (First Stage)
Prioritization Criteria for

Program and Projects	Fit to NARC Agro- GOP Ecol G'lines	Potential Impact	Work at Other Centres Pak. Abroad	Prob. Output Attainment 1-3 yr, 3-5 yr.	Interdisci. Nature	Staff Availability	Cost Estimate (Rs.mill.)	Weighted Priority 1-5 (1=L, 5=
-------------------------	--	---------------------	---	---	-----------------------	-----------------------	--------------------------------	--------------------------------------

(H=High, L=Low, M=Medium)

**FSR CONSTRAINT DIAGNOSIS, INTERVENTIONS
AND SYSTEM INTERACTIONS**

<u>TYPE OF INTERACTION</u>	<u>EXAMPLES</u>
1. <u>Direct Interaction Between Crops</u>	
a) Interactions in space	i) Interaction due to intercropping
b) Interactions over time	i) Conflicts in planting crop and harvest ii) Carry-over of soil structure iii) Carry-over fertility iv) Carry-over and build-up of weed seeds and other pests.
2. <u>Interactions between Crops and livestock</u>	i) Use of crops ii) Use of farm yard manure iii) Use of animals for draft power
3. <u>Resource competition and complementarity</u>	i) Conflicts in labor use and cash needs. ii) Competition for irrigation
4. <u>Meeting multiple objectives of farm household</u>	i) Choice of multiple crops, livestock to manage risk. ii) Planting and storage of food off-farm work, seasonal cash.

*Source: Byerlee and Tripp (1988)

Farming Systems Research

Newsletter

Pakistan Agricultural Research Council

No. 7

June 1990

Chairman's Corner

An important PARC role is to strengthen the national agricultural research system and develop means by which improved technology may be more effectively transferred to farm families.

It is my proud pleasure to enthusiastically support the FSR/MART Project thrust towards the training and improved productivity of rural women. Agricultural Research and the improved technology which follows must be gender neutral. Rural Women play an exceedingly important role in the National Agriculture. We at PARC will continue to encourage the improved welfare of rural women through projects like Farming Systems Research. The Fatchjang experience provides a Model which we intend to expand in partnership with our provincial agricultural research scientists.

Women in FSR Projects

Development of a nation depends on men and women. The majority of rural women in Pakistan are ignorant, unskilled and tradition bound. They, however, contribute much to agricultural and rural development. Women are extensively engaged in farm operations such as, weeding, fodder cutting, livestock management and post/pre-harvest activities. In performing all these functions, they use simple and age old technologies. In spite of all their involvement women's contribution is seldom recognized. Many economic activities of rural women are not included as measures of G.N.P. Moreover, women have been by-passed in many development programs. Women should be given due importance while planning development projects for rural areas. It is also of great concern that rural women acquire more control over their earnings. Their motivation is enhanced when they are engaged in different types of income generating activities. Unfortunately, arrangements have not been made to generate women's specific home and farm technologies that increase their efficiency. Immediate steps are being taken through FSR to provide village ladies education and training in agricultural production technologies to develop their knowledge, attitude and skills. An accelerated

Extension approach and strategies, which ensure transfer of technology according to specific needs and problems of rural women must be further encouraged.

Role of PARC in FSR/Women's Program: In an effort to improve the status of rural women PARC developed a Project specifically for their self improvement under Farming Systems Research. The goal of this activity is to precisely understand the various roles, women contribute to farming operations and to define interventions which can be made to increase productivity and improve their circumstance.

Action Plan: In this regard a national workshop was organized at NARC from January 12-14, 1988. The main purpose of the workshop was to examine the potential role of rural women in Farming Systems Research which could lead to increased crop and livestock productivity and raise income for the farm families. Target areas were selected in provinces. Diagnostic surveys involving interdisciplinary teams of scientists have already been undertaken in the *barani* areas of Punjab and Peshawar, NWFP. These diagnostic surveys involved the assessment of village women problems in agriculture. They considered women's present production and management practices. Development of technologies which would increase productivity and family income, were prioritized.

These surveys and interviews also revealed factors that limit women's participation in farm operations including socio-economic conditions, gender based division of labor, cast and class factors and family structure, etc.

Proposed Interventions: As a result of these surveys the following interventions were proposed:

- Technology development and dissemination strategies in areas women participated i.e. crop, livestock poultry, harvesting, processing and preservation technologies.

- Site specific training and promotion of women extension services for the upgrading of women's knowledge and skills. These included, seed management, weed and pest control methods, disease control in poultry, use of pesticides and safety measures associated with pesticide use.
- Suitable marketing arrangements and women's cooperatives for improving women's income generating activities.
- Planners and policy makers must include women in most agricultural development programs.
- Establishment of village centres for women and small credit schemes should be made available to women.
- Training in improved livestock (especially poultry) husbandry and health care should be provided.

Program Implementation in Fatehjang Target Area:

Implementation of the survey recommendations followed. Interventions and training programs in improved poultry husbandry and pest management of household grain storage were carried out in Fatehjang. The program was developed in collaboration with the Poultry Research Institute, Rawalpindi, and Entomological Research Lab., NARC. Lessons learnt and the experiences achieved from this project will now be expanded to other provincial FSR target areas. Knowledge and management skills of rural women, related to poultry keeping and household grain storage has been upgraded and advanced. Training has been very practical. Special emphasis was focussed on how women can exploit available resources. Knowledge regarding poultry diseases, poultry hygiene, preventive vaccination, treatment of parasitic infections and treatment of simple ailments has been imparted. Fumigation techniques applicable for grain storage, preventive measures for insects and rodents, use of pesticide and Neem oil has also been provided. Women have been trained in the utilization of traditional methods to save and protect stored grain. Feedback information has revealed that rural women have started to extend to other village women folk what they have learnt. Vaccination and control of poultry diseases is being carried out by women on an extended basis. Indeed poultry keeping has become an income generating activity. Women have started to sell eggs in the market. Demand for follow-up, training in other interventions, that will result in generating income is now being requested. FSR women's program in Fatehjang confirms our belief that:

- Greater attention to support women in agriculture will rapidly improve their efficiency, productivity and raise their standard of living.
- Education programs in Agriculture for rural women should be accelerated.

- Development of complete packages to upgrade poultry husbandry, health and marketing practices should be carried out in many rural villages.
- Other programs and interventions such as kitchen gardening and bee keeping offer promise.
- Marketing and operating small business experience for rural women deserves attention.

Field Day at Fatehjang: A field day on Feb. 18, 1990 was conducted to demonstrate FSR project women achievements. Dr. Zafar Altaf, Secretary (Livestock) Punjab and Mr. Abdur Rahman Khan, Vice Chancellor, NWFP Agriculture University with other officials/scientists from USAID, PARC and provincial organizations visited the project area. Rural women of the Fatehjang area demonstrated their FSR poultry and grain storage projects and skills to all participants.

Expansion of Women/FSR Program in other areas: It has been decided to expand W/FSR to other FSR target areas including Kanak in Balochistan. Dr. A. H. Bajoi, Director, Agricultural Research Institute, Sariab, Quetta and other collaborating agencies are planning diagnostic surveys. These will be followed by introducing income generating interventions appropriate for that particular area. The help of Sociology Department, Balochistan University will assist in collaboration with provincial Director of Agricultural Research and Women's Division, Quetta.

FSR Coordinator's Note

FSR Women Associate Coordinator, Ms. Bushra Tariq, wrote this FSR Newsletter. Ms. Bushra with Dr. Shahina (Poultry Research Institute) and Ms. Nabced (Entomology Research Lab., NARC) have been largely responsible for all Fatehjang village FSR Women's project activities.

ILLUSTRATIVE NARC COLLABORATIVE RESEARCH PROGRAMS
FIRST STAGE IMPLEMENTATION

1. Integrated pest control for major barani farming systems
2. Improved tillage to conserve soil and water and increase sustained system productivity.
3. Animal productivity increase through improved fodder nutrition and management.
4. Improved vegetable and fruit cropping systems and post harvest technology.

NOTE:

Each research program is to be:

1. Interdisciplinary and involve basic, applied and system research projects.
2. All research should indicate either generation or, development or transfer of specific technology:
3. Priority research projects of Master Plan that address approved 1st stage NARC selected programs are encouraged.

Table-1

PROPOSED FSR BUDGET ALLOCATIONS 1990-94

FSR Units	Proposed Allocation	
NARC Coordination Cell	260,000	1)
NARC/Fatehjang (Long term trial)	670,000	2)
Punjab	620,000	
Sindh	610,000	
NWFP	240,000	3)
Balochistan	300,000	
Total:	----- 2,700,000 -----	

Source: MART Project PC-1

- 1) Formula Used: Federal = 20%
Provincial = 80%
- 2) Fatehjang allocation based on 50/50 NARC/Punjab
- 3) Note: TIPAN Project provides funds to NWFP

Table 2

POSITIONS APPROVED BY THE CHAIRMAN, PARC FOR TRANSFER
TO THE FSR NARC COORDINATION CELL

Position	No	Source of Funding		Project
		Non-Dev.	Development	
Coordinator	1	1	-	-
Associate Coordinators	4	2	-	1
Stenographer	1	1	-	-
Office Assistant	1	-	-	-
Drivers	2	-	-	-
Peon	1	-	-	-
Total:	11			

- (1) Already transferred:
1. Coordinator (Agronomy)
 2. Coordinator (Animal Sc.)
 3. Stenographer
- (2) To be transferred:
1. Women FSR Coordinator
 2. Social Scientist
 3. Office Assistant
 4. Drivers (Two)
 5. Field Assistant
 6. Peon

Table 3

Total budget requirement for FSR Cell and NARC/Provinces
(Operational Only)

<u>1990-91</u>	<u>1991-92</u>	<u>1992-93</u>	<u>1993-94</u>	<u>1994-95*</u>	<u>Total</u>
2700000	2750000	3025000	3327000	915000	12717000

* 3 months

Table 4

Proposed Funding Sources for FSR Project 1990-91

<u>FSR Unit</u>	<u>Category</u>	<u>Sources</u>			
		<u>Govt</u>		<u>MART</u>	
		<u>PARC</u>	<u>Province</u>	<u>GOP</u>	<u>Project</u>
1. NARC Co-ord Cell	Operation Staff	X		X	
2. NARC Fatehjung	Operation Staff	X			X
3. Provincial Co-ord Cell	Operation Staff		X		X
4. Provincial	Operation Staff		X		X

Issues:

1. What is the amount of funds available for FSR 1990-91.
 - a. MART/GOP
 - b. MART/Project
2. What provisions are being made to budget FSR Coordination (Amount in Rs.)
 - a. 1990-91 Federal FSR =
 - b. 1990-91 Provincial FSR =
3. What are the available funds to support FSR through end of Project 1994.
 - a. Federal
 - b. Provincial

INDICATORS OF ACHIEVEMENT FOR ASSESSING FSR PROJECTS

<u>Indicator</u>	<u>Evidence</u>	<u>Sources of Information</u>	<u>Assumptions</u>
1. Adption of technology	Increased acreage Higher Yields Same yield with lower input levels (costs) Greater yield stability Higher cropping intensity improved labor efficiency Improved timeliness of crop/animal practices	Observation (site visits) Government Statistics Research reports Discussions with researchers Discussions with farmers	On-shelf tech exists Intervention require only small change in farmer practices infrastru-cture is sufficient FSR has had enough time researchers focused on correct prob
2. Partci-pation in FSR	Involvement of farmers in decision making and trial management Collaboration of commodity scientists, university specialists, extension workers, and private sector	Discussions with farmers, extension, commodity researchers, donors, and policy makers. Reports noting number of field days, meetings, etc.	FSR has established credibility. Training has been adequate Extension is willing to collaborate
3. Feedback From FSR	Change in commodity research priorities Number of commodity/FSR planning meetings Confirmation or adjustment of recommendations Private sector interventions High commodity/FSR staff morale	Discussions with farmers, reserachers, extension, and private sector. Reports (on meetings) and annual work plans	FSR has advanced to testing stage Training has been adequate Information exchange been adequate
4. Interdis-ciplinar-ity.	System interaction have identified Appreciation and basic understanding of other disciplines exists. Trials focus on crop/livestock interactions. Whole farm perspective Factorial experiments.	Discussions with FSR commodity reserachers Reports Work plans	FSR training has been sufficient FSR has had enough time

<u>Indicator</u>	<u>Evidence</u>	<u>Sources of Information</u>	<u>Assumptions</u>
5. Training in FSR	Number of short-courses, seminars, workshops, field days, post-graduate degrees, changes in university curriculum, MS research these at FSR sites, training materials available	Discussions with researchers, university staff, graduates	Univ. have changed curriculum FSR has had time to be influential
6. Institutionalization.	FSR budget trends, number FSR experiments, amount training, % NARC time in FSR involvement, Decentralized decision making at FSR sites Routine field days, newsletters, planning meetings University FSR courses	Discussions with donors, researchers, policy makers, extension workers, administrators, Reports, work plans	FSR fits GOP development objectives FSR has been adequately staffed and funded. FSR coordin. units have been effective