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PILOT TO PRODUCTION PROGRAMS: PLANNING, MONITORING AND ON-GOING EVALUATION

by

Marlin Van Der Veen

August 1991

PARC • USAID • MART • WINROCK

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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.

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Pilot to Production Programs: Planning, Monitoring and On-Going Evaluation.*

by

Dr. Marlin Van Der Veen

Introduction:

The FSR program in Pakistan has identified, developed, and tested in farmers fields, a large amount of improved agricultural technology thought to be highly suitable to small farmers. There is strong interest in bringing this improved technology to a large number of farmers as quickly as possible and thereby increase rural incomes. Pilot to Production programs can be very useful in the early attempts to transfer FSR technology to farmers.

There are five main reasons for carrying out pilot to production (or pilot productions) programs. These are to:

1. Determine the institutional and social requirements for the accelerated adoption of a new production technology i.e.

    a) improvements necessary in the extension, credit, market and community organizations;

    b) the management structure needed to ensure the timely delivery of production factors;

    c) the costs of the changes suggested in (a) and (b) above.

2. Evaluate the benefits derived by the farmers and the community from the adoption of new technology.

3. Determine the major constraints to adoption (i.e. reasons why some farmers are not adopting the new technology) or high yields or levels of productivity.

4. Devise and implement practical measures for overcoming constraints and

5. Last but not least, demonstrate the value and feasibility of using farming systems technology over relatively large land areas and involving many small farmers.

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* Parts of this paper are taken from M.G. Van Der Veen "Monitoring and Evaluating Pilot Production Programs" and G.L. Denning "Pilot Production Programs" in Farming Systems Socio-economic Research Training Course Training Materials. IRRI 1986.

This paper gives a brief explanation of how pilot production programs are planned, monitored and evaluated. The appendix gives more detail on planning, monitoring and evaluation of pilot production programs to be carried out in Pakistan FSR related to: 1) the zero tillage wheat seeders (ANNEX A.) and 2) The women's poultry production programs (ANNEX B).

Planning Pilot Production Programs:

A production program has 6 major components. These are:

1. Technology;
2. Management;
3. Extension;
4. Input supply;
5. Credit; and
6. Marketing.

The recommended technology should first be agreed on by a technical committee composed of research and extension personnel. Ideally this committee should be operational from the early stage of FSR. This helps in adjusting the recommendation to the norms of both the researcher and extension worker.

Production recommendations should be as clear and as simple as possible. The fewer the messages the farmer receives the more likely he is to carry them out.

The second important component of a production program is a program management committee. Its function comprises overall management, planning and coordination of the program.

The program management committee should be a group of people who have the ability, resources and power to direct the formulation and implementation of the support structure of a production program.

Necessarily, the management committee is multidisciplinary and multi-institutional and may be composed of:

a) Representatives from the organization sponsoring the pilot production program;

b) representatives of local government and private sectors responsible for inputs, credit, extension and marketing; and

c) representatives of farmers and researchers.

This committee should meet regularly to ensure smooth implementation of the program. Its main function includes:

a) defining the scope of the program;

b) allocating tasks for participant members;

c) problem solving; and

d) responding to the findings of monitoring and evaluation.

An effective extension service is another vital component of the production program to communicate the recommended technology to the farmers. Extension personnel placed throughout the production program area work with farmer cooperators.

Members of the extension service should be trained to understand the recommendation and be able to identify the fixed and variable events which condition recommendations. The technical committee which formulated the recommendation may be involved for the training.

The extension method employed will depend on the local situation. Communication may be through village bill boards, village committee, farmers meetings, radio communication and combinations of these media.

The inputs most frequently needed include:

- vaccines
- feeds;
- seeds;
- fertilizers;
- chemicals;
- small farm equipments, etc.

The recommended inputs should be available to the farmers:

- in appropriate formulations;
- in sufficient quantities;
- in appropriate packaging;

- at the right time; and
- at the right place

This will require advance coordination among the program management, the extension service and the input suppliers. This is most effectively achieved through the management committee. In case of non-availability of a recommended input, a substitute may be recommended by the technical committee.

The provision of seed supply needs special attention because a recommendation usually involves the use of new varieties. For this, seed supply organizations, government or private, should be identified way ahead.

Farmers may be encouraged subsequently to produce seeds for themselves and for sale under expert guidance. To produce, store and supply seed for the need of a production program, farmers may be offered a premium price.

Even with a recommendation, backed up by an adequate input-supply and extension service, the adoption of the recommended technology by majority of the farmers may be limited by their cash resources. Credit facilities may be required to meet this need.

In certain circumstances it may be possible for farmers to obtain at least part of their credit requirement from a non-institutional credit source. It has the advantage of easy access and flexible repayment schedule. But interest rates for such types of loans are often very high.

The institutional credit may come from the lending institutions or some project-financed credit schemes.

The lending institutions may require information on the economic viability of the technology. In this context the representation of lending institutions in the management committee is essential.

The project-financed credit schemes are to encourage full institutional credit support. They are not a replacement to lending institutions. Such schemes should operate as closely as possible along the lines of a formal lending institution.

Five important guidelines to operate an effective credit system are:

1. Timeliness in credit availability;
2. Appropriate repayment schedule;
3. Flexible conditions for credit eligibility;

4. Appropriate loan structure in terms of cash and material input; and

5. Proper mechanism of loan release and collection.

The 6th component of the production program is marketing. The ability of the existing market to support increased production of an existing crop or animal may be crucial. New distribution channels may need to be established in advance of such production increases.

Where new crops or livestock products are being grown and a local market for such a produce does not exist, government or private action to procure the commodity at a support price is essential. Other requisites associated with marketing are suitable drying and storage facilities, and transportation facilities.

Monitoring and Evaluation

In general, data are collected on pilot production programs for three main (but in many cases overlapping) purposes; 1) for monitoring (assessing project operation); 2) for on-going evaluation of program effects and impacts (assessing project performance) and 3) for expost evaluation(evaluation after the project is completed) of impact (2).

Monitoring

Monitoring is the timely recording and feedback of the activities being carried out in a pilot production program and of problems being encountered.

Rapid feedback from the pilot production sites is important where intervention in the input, credit and/or extension institutions may be required.

Despite prior organizational meetings and commitments, the required seed or fertilizer may not be available when needed, credit may not be released to farmers, or the extension staff may not be at the site. Other problems could include diseases, insect infestation and the lack of the proper insecticides and/or medicines. If the managing committee is made aware of the problem as soon as it occurs, intervention might be possible so as to overcome the problem before it detrimentally affects the production program.

For example, if it is known, two months before the planting date that the seed and fertilizer that is needed has not arrived at the site, time is available to determine why the seed and fertilizer hasn't been supplied, and to ensure that the seed and fertilizer are supplied on time.

Detailed information on what actually happened at the site, concerning the extension campaigns, credit supply, input and output marketing, irrigation etc., can be recorded by the monitoring activity.

This data could provide better insights on: 1) shortcomings in the performance in the support institutions; 2) improvements in the performance which should be made and 3) requirements for successful production programs. This documentation is especially important when alternative extension or credit approaches are compared.

Evaluation

On-going evaluation of pilot production programs analyzes progress over time. Measurement of the effects and the impacts of the activities can be made seasonally or annually. Changes that occur in total cropped area and in the number of farmers within the program, as well as in improvements in cropping intensity, level of input use, yields, net returns etc are compared to expectations.

When achievements are less than expectations, studies on the constraints to adoption or higher yields are conducted. Information on the constraints to high yields or to adoption is used to help determine how the production program can be improved in order to achieve the expected results.

For example, if it is found that the lower than expected yields were caused by zinc deficiencies, zinc could be included as a recommended input to be used in the pilot production program.

On-going evaluation of pilot production program also allows the timely documentation of progress. This timeliness can be extremely important if efforts are made to demonstrate the farming systems approach to policy makers and donor agencies in order to gain continued or additional project support. For example, on-going evaluation can allow the seasonal reporting, of the number of farmers and hectares in the program, improvements in yields and incomes etc.

Expost evaluation

Expost evaluation of pilot production programs generally occurs a number of years after the initiation of the production campaign and frequently after the main extension efforts are completed. At this time the impact, experiences and the lessons learned from the program are comprehensively reviewed.

The information gained from the expost evaluation can help: 1) in determining how best to carry out other pilot production programs; 2) in designing and implementing full scale production programs; 3) in gaining program support and 4) in making policy recommendations.

For example, more effective and/or efficient ways of supplying credit and/or extension to farmers may have been identified and tested in the program. These more effective practices could be recommended to policy makers for consideration.

A measurement of the benefits that arise, after a few years, from a pilot production program to the farmers and the local community, could be very valuable when attempting to gain the support of governmental officers, support institutions, and aid donors for other production programs.

These benefits could include increased: 1) net income to farmers; 2) nutrition; 3) agricultural employment; 3) education to children; 5) farm or household capital; 6) non-farm employment; 7) tax revenue; 8) fodder or feed for livestock etc. Equity questions concerning the changes in the distribution of income between landlords, tenants, landless workers, etc. could also be studied.

The documentation of the benefits helps support the argument that Farming Systems Research and Pilot Production Programs are, in fact, worthwhile activities.

Information on cash costs and other resource needs for the pilot production programs can be used in planning and budgeting for expanded production activities. The data on costs and other requirements of pilot production programs can help in the estimation of how large a production program can be feasibly started, given the available resources, and how quickly the program can be expanded in the years ahead.

In carrying out pilot production programs one learns through doing. Thus, well conducted expost evaluations of earlier initiated pilot production programs can also give insights on how new pilot production programs can be more efficiently and effectively carried out.

Methodologies for On-Going Evaluation

In assessing project performance, changes that occur in such things as: 1) weight gain; 2) mortality; 3) birth rate; 4) total cropped area; 5) number of participating farmers; 6) yields; 7) inputs used; 8) costs and; 9) net returns etc are compared to expectations or targets. When targets are not achieved, more indepth studies, on the constraints to high yields or adoption, are carried out.

Target setting

Targets are used to assess the on-going progress of the pilot production program. If set realistically, targets can help indicate serious problems that may exist in the program and which may need attention.

Generally targets are based on an understanding of the present agricultural situation of the site. Information on the yields being harvested, crop varieties grown, levels of inputs used, cropping patterns followed etc. are collected by formal farmer surveys or other means.

Realistic estimates of the improvements that can be made, from the present situation, are based upon the levels of resources and manpower available for the program, the difficulties to be expected and previous experience.

The targets can be set seasonally or annually and can be modified as learning occurs, during the early phases of the pilot production program.

Control farmers or parcels

In some cases the levels of inputs used, yields harvested, and levels of income derived by farmers in the pilot production programs, are compared to those of non-participant (or control) farmers, (or parcels not devoted to the program), as well as to the set targets.

The controls provide a check on the data used for the development of the targets (was the baseline data on the level of inputs used by farmers correct, for example).

The controls can also provided very useful data during a typical year. Although target yields may not have been achieved, due to very low amounts of rainfall for example, the data may show that the participants harvested two tons/ha more than the non-participants. This would be a good indication that the technology is satisfactory, despite the harvest of yields being lower than what would be expected in average years.

Area and number of participants

In most pilot production sites, up to date information is routinely recorded on the number of hectares presently being devoted to the pilot production program and on the number of participating farmers. This information is collected by the site staff actively involved in the production program. Hectarage and participant number are collected thru frequent contacts with farmers and in some cases by actually taking measurements of parcel sizes. In some cases the crop varieties and levels of inputs used by participating farmers are also known because of the close supervision which is provided.

Farmer to farmer canvassing is another method that can be used to acquire a quick estimate of the number of farmer participants and of the area devoted to the program. This method can be especially useful if the pilot production program is focused within a small area - one village or production block for example.

Yields, levels of inputs and returns

Crop cuts for yield estimates are also routinely being carried out in some programs. Parcels devoted to the pilot production program and nearby control parcels, not being devoted to the program (but similar in other important respects), are (more or less) randomly selected for sampling.

The number of samples is determined by the amount of land devoted to the program but also by the amount of staff and other resources available for crop cuts.

Estimates of the levels of material inputs used by non-participant farmers, can be derived from a short farmer interview. Farmers who farmed the parcels selected for crop cuts can be given what is called the "Farmers Practices Interview" concerning the parcel (Appendix A). The interview takes only five to ten minutes to complete. This interview is also given to participant farmers if the levels of materials inputs used were not known.

In some cases the participant farmers are also interviewed about the technology used by them before becoming involved in the program. These same farmers were also questioned about the yields they would have expected if they would have used their old cropping practices during the past season. In this way "before" and "after" data are collected.

Rough estimates of the differences in the labor and power costs, between participants and non participants, can be made from standards developed from previous farming systems or other research.

More precise estimates of labor and power input differences, between participant and non-participant farmers, can be developed thru careful and frequent farmer interview. However, interviewing farmers and processing data on labor and power inputs can be very time consuming, limiting the amount of other research activities which can be initiated.

Farm record keeping is also used to document changes or differences. The farmers themselves record data concerning the inputs used, yields harvested, cash flow etc., on a daily or weekly basis, for a number of years. The records of "participants" can be compared to the "controls" and to the targets. Farm record keeping can be a very useful tool for collecting data to measure improvements on a farm, as more and more of the cropped are a becomes devoted to improved technology. However, keeping records on a large number of farms can result in a backlog of data to be processed and analyzed.

Large random farmer surveys are not a cost effective means for collecting cost and returns data on participant and control farmers. This is particularly true during the early stages of pilot production programs when the "participants" are only a small proportion of the farmers in the area.

Examples of summary tables for the on-going evaluation of pilot production program effects and inputs are shown in Appendix B.

Methodologies for Monitoring

Project monitoring can range from being very informal to being very formal, such as that proposed for the Training and Visitation (T&V) system. What is needed is that the required information be written down (rainfall for example) and that information concerning a specific problem be relayed to the central managing committee as soon as possible.

In most cases, a short schedule is filled out every two weeks at each pilot production site. The forms are sent as quickly as possible to center, where action can be initiated on problems that can not be adequately handled at the site. All of the information presented is compiled and an uptodate record is kept on the progress of the production programs.

Appendix A

FARMERS' PRACTICES INTERVIEW FORM

Method of parcel selection: _____ Date: _____

Farmer's name: _____ Village: _____

Name of interviewer: _____ Size of parcel: _____
Measured: _____ Estimate: _____

Type of field (upland/lowland highly production/unproductive etc):

_____

Crop: _____ Variety: _____

Planting date: _____ Harvesting date: _____

How much seed did you use for this crop on this parcel: _____

Where did you get the seed? _____

What was the cost of the seed? _____

Did you apply any compost to this crop?
_____ Yes _____ No

If yes, how many baskets? _____

Did you apply any chemical fertilizer to this crop?
_____ Yes _____ No

If yes,

Kind of fertilizer used	Quantity used (in kg)	Fertilizer cost (in Rs.)
Basal		
Top dress		

Did you use any other chemicals on this crop?

_____ Yes _____ No

If yes, what kind? _____

How much did it cost? _____

Did you receive any irrigation for this crop?

_____ Yes _____ No

If yes, when? _____

What was the source of irrigation? _____

How does the yield of this crop compare with the crop you had on this parcel last year?

Decreased _____ Same _____ Increased _____

If decreased or increased yield what were the reasons?

_____

_____

_____

Do you plan to plant the same crop and the same variety of crop on this parcel next year? Explain

_____

_____

_____

What was the previous crop and variety on this parcel?

_____

Crop yield sample

Sample size (m^2) _____

Weight of grains (kg) _____

Moisture content (%) _____

Appendix B

Suggested summary tables
for
on-going evaluation of pilot production program affects and impacts

(All the figures are fictitious and are used for example only)

Table 1. Pilot production program coverage in comparison with the targets set.

Location	Land type*	Cropping pattern	Number of farmers			Area covered (ha)		
			Target	Achieved	% Achieved	Target	Achieved	% Achieved
Parsauni	IWL	R-W	100	117	117	75	75	100
	IWL	R-W-M	50	40	80	25	20	80
Pumbi	DL	M/FM-W	80	40	50	40	10	25
Bhumdi	RFWL	R-W	60	36	60	30	20	66

*Land type: DL = dry(up) land;
IWL = irrigated wet(low) land;
RFWL = rainfed wet (low) land etc.

Table 2. Yield comparisons between the participants, non-participants and the set targets of the pilot production programs.

Location	Land type*	Cropping pattern	Yields (tons/ha) 1st crop	2nd crop	3rd crop	Total	% of target
Parsauni:							
Participant	IWL	R-W	5.1	3.5	n.a.	8.6	115
Non-participant	IWL	R-W	3.4	2.0	n.a.	5.4	72
Target	IWL	R-W	4.5	3.0	n.a.	7.5	100
Participant	IWL	R-W-M	4.5	3.6	3.1	11.2	118
Non-participant	IWL	R-W-fallow	3.4	2.0	n.a.	5.4	57
Target	IWL	R-W-M	4.0	3.0	2.5	9.5	100
Pumbi:							
Participant	DL	M/FM-W	4.3	1.4	1.2	6.9	90
Non-participant	DL	M/FM-W	2.6	1.2	0.9	4.7	61
Target	DL	M/FM-W	4.0	1.2	2.5	7.7	100
Bhumdi:							
Participant	RFWL	R-W	3.4	1.3	n.a.	4.7	85
Non-participant	RFWL	R-W	2.1	1.0	n.a.	3.1	56
Target	RFWL	R-W	3.0	2.5	n.a.	5.5	100

*Land type: DL = dry (up) land;
IWL = irrigated wet (low) land;
RFWL = rainfed wet (low) land etc.

Table 3. Gross returns, material costs, gross margins, and marginal benefit cost ratios in the pilot production areas:

Location	Land type	Cropping pattern	Gross returns	Material costs*	Gross margin**	M C B R***
Parsauni:						
Participant	IWL	R-W	21,500	1,800	19,700	11.4
Non-participant	IWL	R-W	23,500	1,100	12,400	x
Target	IWL	R-W	18,750	2,000	16,750	5.8
Participant	IWL	R-W-M	28,000	2,400	25,600	16.1
Non-participant	IWL	R-W-Fallow	13,500	1,500	12,000	x
Target	IWL	R-W-M	23,750	2,600	21,150	9.3
Pumdi:						
Participant	DL	M/FM-W	17,250	16,000	15,650	5.5
Non-participant	DL	M/FM-W	11,750	600	11,150	x
Target	DL	M/FM-W	19,250	2,000	17,250	5.4
Bhumdi:						
Participant	RWFL	R-W	11,750	1,400	10,350	4.4
Non-participant	RWFL	R-W	7,750	500	7,250	x
Target	RWFL	R-W	13,750	1,600	12,150	5.5

* Material cost: seed, fertilizer and pesticide.

** Gross margin = Gross Return - material cost.

*** Change in gross returns from non-participants divided by change in material costs from non-participants.

ANNEX A.

The Zero Tillage Wheat Pilot Production Program For The Punjab Rice-Wheat System

Prepared with the assistance of
Mr. M. Aslam,
Dr. Munir Ahmad
Dr. M. Khalid.

Zero till wheat sowing technologies have been developed and tested which allow the timely sowing of wheat and a reduction in costs of production due to the avoidance of land preparation activities.

The zero till technology for heavy high clay content soils is being developed by AARI and involves broadcasting the wheat seed into the rice stubble with an irrigation.

The zero till technology for medium and light textured soils involves the use of multi seed cum fertilizer drills originally produced in New Zealand but later manufactured in Pakistan.

Four years' on-farm trials with the drill and one year's experience in a production/demonstration program with farmers have shown that using the drill can allow earlier sowing, higher yields and reductions in costs of production. Some data have shown that weed populations in wheat are reduced with zero tillage but the rice stem borer populations may be increased. These require further study.

Interviews with farmers, using the drill, have consistently shown that the farmers are interested in applying the zero till technology on all of their wheat land, provided a suitable drill is available.

Experience has also shown that neither the New Zealand drill nor the locally manufactured drill are suited for farmers or for commercialization by private industry. This is because of the excessive purchase costs, repair costs and weights of the drills.

A prototype of a more suitable multi seed cum fertilizer drill is being developed by the Farm Machinery Institute, NARC, and will be available for testing in the 1991 wheat planting season.

THE 1991/92 ZERO TILLAGE WHEAT PILOT TO PRODUCTION PROGRAM

On the basis of past experiences and lessons learned, a pilot production program based on zero tillage wheat is planned for 1991/92. The objectives of the pilot production program are to:

1. Accelerate the adoption of zero till technology i.e.,

   a) design, develop, test and demonstrate a prototype unit of a low cost no till seed cum fertilizer drill;

   b) involve private manufacturing firms in the commercial production of the no till drill; and

   c) convince farmers, extension workers, government officials and policy makers of the benefits of the zero till sowing technologies and to gain full support of all.

2. Evaluate the benefits derived by the farmers with the adoption of zero till wheat sowing;

3. Determine the major constraints to adoption (i.e., reasons why some farmers are not adopting the new technology) or high yields or reductions in the costs of production. (Pay particular attention to weed and stem borer population in wheat and rice).

4. Last but not least, demonstrate the value and feasibility of using zero till technology over relatively large land areas and involving many small farmers.

Program Policy and Organization Committee

Chairman: Mr. Ghulam Abbas Jalvi,
Director General of Agri. Extension , Punjab.

a) Dr. N. I. Hashmi
b) Dr. M. Qasim Chattha
c) Dr. Munir Nayyer
d) Dr. Mohammad Hussain
e) Dr. Mohammad Khalid (Secretary)
f) Manufacturers and Ag. chemical representatives from the private sector.
g) Other members to be decided.

Program Implementation Committee

a) Ch. Maqbool Ahmad, Director of Agriculture Extension, Punjab. Convener
b) Rana Farman Ali Khan, Dy. Director (Agri. Ext.), Gujranwala
c) Mr. Mohammad Amir
d) Dr. Munir Ahmad
e) Director Pest Management and Quality Control
f) Other members to be appointed.

Technology Recommended for Zero Till Drill

a) Descon Multicrop Seedmatic Drill (provided)
b) 60 H.P.+ tractor with good hydraulic system (Hired/rented)
c) DAP at time of planting/sowing (Farmer)
d) Seed of Pak-81, or Pb-85 (Farmer)
e) Seed rate 40-45 kg/Ac (Farmer)
f) Urea top dress at time of first irrigation (Farmer)
g) Herbicide (Dicuran - MA, or Tribunil) (Farmer)
h) Avoid use of drill in heavy soils with high clay contents (Rohi and Rohi Mehrra)
i) Drill in fields with short stubbles and no rice straw.
j) Use Wadwatter (residual moisture)
k) Sow wheat as soon as possible after November 7.
l) Apply first irrigation after 30/35 days of emergence.
m) Apply herbicide after 1st irrigation in wet condition.

Program Targets

Location:	Gujranwala and Sialkot
Land Area:	750 acres
Number of farmers:	100
Change in yields	1) No yield loss with zero till if sowing dates are the same. 2) Yields are higher with zero till if earlier planting does occur with zero tillage
Change in costs	Costs are reduced with zero tillage up to Rs. 300/acre as it does not involve any type of land preparation.
Change in profits	Increased by at least Rs 300/acre

Support Services Needed

1. To convince farmers to participate.

2. To schedule the use of drills.

3. To inform the farmers about the recommendations.

4. To hold field days
   a) at sowing time
   b) soon before harvesting

5. To study the effect of zero tillage trials on stem borer incidence (Director Pest Warning).

6. To repair and maintain drills (spare parts, tools and mechanics)

7. To ensure seed, fertilizers, herbicides and other inputs will be available from private enterprise in the local markets. (Private firms will also be encouraged to participate in the weed and stem borer trials by providing chemical inputs.)

Short Term Strategies

The plan is:

1. To bring all the drills to either the Farm Machinery Institute NARC or ORP Workshop Gujrat by the first week of September 1991 for repair (Wheat Program/ORP Gujrat).

2. To identify the parts which need to be replaced (FMI, NARC Islamabad).

3. To purchase parts for current repair, and for needs during the sowing season (FMI, NARC Islamabad).

4. To repair, adjust, and calibrate the drills by mid of October 1991.

5. To select villages by 20 Oct.

6. To place the drills in the villages by the 25th of October 1991. (Wheat Program NARC, ORP Gujrat).

7. To arrange the availability of 60 h.p. or above tractors with good hydraulic systems for drilling operation by the 25th of October.

8. To hold a 3 day training program for tractor operators about the operation and maintenance of drills during the last week of October.

9. The Director ORP, should depute mechanics, engineers and operators to work with the mechanics and engineers of the Farm Machinery Institute during the wheat sowing season 1991. These men should be trained in the repair, maintenance and operation of drills.

10. The drills should be recalibrated and rechecked after transport to the villages and before the start of planting.

Farmer Participation

The participation of farmers will be encouraged by carrying out a number of activities. Deadline for the completion of each activity will be set and verifiable indicators will be specified for ease in monitoring.

	Activities	Deadline Date	Verifiable Indicators
1.	Farmers' meetings to encourage farmers to participate	7 Oct	Form M1 (App. A)
2.	Listing of potential participants and area devoted to rice-wheat	12 Oct	Form M2 (App. B)
3.	Commitment by farmers to devote a specific area to zero tillage	15 Oct	Form M2
4.	Farmers' training in technology	30 Oct	Form M1
5.	Transport of Drill to village.	25 Oct	Observation
6.	Scheduling of fields to sow	28 Oct	Form M2
7.	Rechecking of calibration	28 Oct	-
8.	Field days during sowing	15 Nov	Form M1
9.	Field days before harvesting	15 April	Form M1

Long Term Strategies For Design, Development, Performance Evaluation, Local Manufacturing And Popularization Of Low-Cost No-Till Seed-Cum-Fertilizer Drill (1991-1995)

The strategies are:

1. To design and develop a prototype unit of seed-cum-fertilizer drill in the Farm Machinery Institute, NARC, which must have the following features:

   a) The drill can be operated with a medium sized (45 h.p.) tractor

   b) The drill price should be about Rs 25,000.

c) The drill can be manufactured by local manufacturers; which is necessary for the provision of after sale services and spare parts.

2. To test and evaluate the drill in rice-wheat cropping area during the wheat sowing season of 1991 and 92.

3. To demonstrate the prototype unit of low cost no till drill in working conditions to farmers and local manufacturers during the wheat sowing season of 1991 and 1992.

4. To identify potential local manufacturers for the manufacturing of the drill after successful demonstration of the prototype.

5. To assist local manufacturers in manufacturing and popularization of low cost no-till drills.

Monitoring and Evaluation

In general, data are collected on pilot production programs for three main purposes: 1) for monitoring (assessing project operation); 2) for on-going evaluation of program effects and impacts (assessing project performance) and 3) for expost evaluation (evaluation after the project is completed) of impact.

Monitoring in the Zero Till Wheat Program

Monitoring is the timely recording and feedback of the activities being carried out in a pilot production program and of problems being encountered.

Monitoring will be accomplished by the regular use of three proformas. One is the Management Information Systems Report form (M1) (Appendix A) which is to be filled out and submitted weekly. The form contains information on extension and ORP activities, numbers of participating farmers, acres sown and problems encountered.

The second form (M2) (Appendix B) is the Farmer Participation Report which is to be kept current but submitted weekly.

The third form is the Daily Drill Operations form (Appendix C). A new sheet will be completed each day a drill is used and all the completed forms will be kept with each drill for ease in checking. All the completed forms will be collected at the end of the wheat sowing season for further study.

Program Evaluation and Impact Assessment

The impact of the zero till technology will be assessed in regards to relative yields, costs and net returns in wheat production grown under farmers' methods and grown under zero till methods. The performance of the succeeding rice crop will also be assessed to measure crop interactions such as increased rice stem borer incidence, seed growth, plant nutrient availability, etc. Farmers will also be interviewed concerning their views of the suitability of the zero till wheat sowing technology.

Recording harvest data

The following yields will be estimated for each participating farmer:

a)	Wheat yields	1)	farmer's planting method
		2)	zero till planting method
		3)	zero till planting method with recommended herbicide use (a sub-sample of 20 farmers)
b)	Succeeding rice yields	1)	following farmers' method of wheat planting
		2)	following zero till planting
		3)	following zero till planting with insecticide for stem borer control.

Yields will be estimated by taking four 3m² samples from each treatment at harvest. Bundles will be wrapped in cotton bags to avoid grain loss, transported to a nearby research station or other site, and dried in the sun. Afterwards they will be threshed with a Winter-steiger plot combine and grain yield/weight will be measured.

Inputs used, practices followed and farmers' reactions

Each farmer will be interviewed after the wheat harvest and after the rice harvest. The purpose of the interviews will be to determine the types and levels of inputs used, the farming practices followed (and timing)and the farmers' assessment of the zero till wheat seeding technology used on the farm. A draft of an interview form that can be used is contained in Appendix D.

Form M1

Appendix A

Zero Tillage Wheat Production Program
Management Information Systems Report
(To be filled weekly)

Location _____

Period _____ to_____ . Responsible Person_____

	Column 1 This report	Column 2 Last report	Column 3 Total (1+2)
Extensions and ORP activities			
Number of farmer meetings			
Total number of farmers attending			
Number of farmers agreeing to participate			
Total number of acres committed			
Number of farmer training sessions			
Total number of farmers attending			
Number of field days			
Number of farmers attending			

Number of Participating Farmers and area sown

	This report	Total last report	Total to date
Number of farmers participating			
Number of acres sown to 0 till			

Problems* encountered

Topic	Definition and cause	Action taken	Action recommended
Drill breakdown			
Shortage of participating farmers			
Lack of herbicide and insecticide			
Other (a)			
Other (b)			

*Serious problems should be communicated to the coordinator by telephone or other means as soon as possible for corrective action.

Form M2

Appendix B

Zero Tillage Wheat Production Program
Farmers Participation Report
(To be filled weekly)

Village _____ Responsible Person _____

Column 1	Column 2	Column 3	Column 4	
Names of farmers willing to participate	Acres devoted to rice-wheat	Acres committed (Max 8 acres) Acres sowing date	Area sown to zero tillage 1st date of sowing	2nd date of sowing

APPENDIX C

DAILY DRILL OPERATIONS

Drill Number _____ District _____ Tehsil _____

Date _____ Operator/Supervisor _____

Time of Day		Activity* (repair, transport, seeding, rest period, idle etc.)	Kilometers if traveling	Farmer's Name	Acres Seeded	Acres ID No. or loc.	Sq. No.	Village	Tractor Owner	Signatu
From	To									

* If repairs were needed, explain the problem _____

Action taken _____ Parts replaced _____ Parts repaired _____

Location of repair _____ _____

Time required to purchase or repair part _____ Time required to install the part or repair the drill _____

BEST AVAILABLE DOCUMENT

Appendix D
FARMERS' PRACTICES INTERVIEW FORM

Date: _____

Farmer name: _____ Village: _____

Name of interviewer: _____
Total acres farmed _____
Owned _____ Rented _____ Both _____

Size of parcel:
0 Till _____
Conventional _____

Crop: _____

Variety:
0 Till _____
Conventional _____

Planting date: 0 Till _____ Conventional _____
Harvesting date: 0 Till _____ Conventional _____

How much seed did you use for this crop on the parcels:
0 Till _____ Conventional _____

Where did you get the seed? 0 Till _____ Conventional _____

What was the cost of the seed? 0 Till _____ Conventional _____

Did you apply any compost to this crop? Yes ____ No _____

If yes, how many carts? 0 Till _____ Conventional _____

Did you apply any chemical fertilizer to this crop? Yes _____ No _____
If yes,

Kind of fertilizer used	Quantity Used (in kg)	Fertilizer Cost (in Rs.)
Basal		
0 Till		
Conventional		
Top dress		
0 Till		
Conventional		

Did you use any other chemicals on this crop?
Yes _____ No _____

If Yes, what kind? 0 Till _____ Conventional _____

How much did it cost? _____

Did you receive irrigation for this crop?
Yes _____ No _____

If Yes, when?_____

What was the source of irrigation? _____

How does the yield of this crop compare with the crop you had on this parcel last year?

0 Till

Decreased _____ Same _____ Increased_____

Conventional

Decreased _____ Same _____ Increased_____

Do you plan to plant more of your wheat following the no till method next year? Explain

_____

_____

What are the main advantages of the zero till system?

_____

_____

Are there any disadvantages to the zero till system?
Yes_____ No _____

Explain.

_____

_____

ANNEX B

Women's Poultry Pilot Production Program: Fatehjang

Prepared with the assistance of
Dr. B.M. Bhatti,
Dr. Naseem Fawad
Mrs. Bushra Tariq

A women's poultry production training course in Fatehjang is being planned. A main objective of the course is to implement a pilot production program. This ANNEX gives a brief description of the course and describes how the monitoring and evaluation activities will be carried out.

Program Objectives:

1) Increase the levels of net income of rural farm women in Fatehjang by improving poultry production.

2) Develop a practicable and sustainable model for improving the income of rural women that can be applied in other villages in Pakistan. Sustainability will be enhanced by establishing stronger linkages between the women and private enterprises for input and output marketing.

3) Develop and implement an appropriate monitoring and evaluation activity to provide ongoing information on program progress, impacts, effects, constraints and problems.

How It Will Be Done:

1. Knowledge gained from: 1) the previous training course in the area; 2) observation and informal discussion of the staff with the women and 3) the impact survey which identified the problems remaining with the women in poultry production and the women's interests, objectives, and concerns in raising poultry.

2) Improved but suitable technology and management will be introduced to the women which overcomes their poultry production problems and meets their needs and objectives. This technology includes the Fume breed for egg laying, the Rafi breed for those desiring a dual purpose bird, medicines for control and treatment of diseases and parasites, improved feeding practices including the use of the concentrated feed pack and improved management in hatching, chick raising, broiler and egg production. Chicks, concentrated feed packs, vaccines and other inputs will be sold to the women.

3. On the spot training will be given to the women. The training objectives are to enable the women to:

   a) Choose amongst the poultry breeds for raising according to the relative advantages and disadvantages of the Fumi and Rafi breeds.

   b) Successfully use vaccines and other medicines to prevent diseases;

   c) Diagnose and seek treatment for poultry diseases;

   d) Learn improved feeding practices for chicks, broilers and layers;

   e) Manage their poultry to enhance production and minimize losses; and

   f) Purchase the required inputs when needed and to sell their produce in a satisfactory manner.

4. A mechanism will be developed to help ensure the supply of inputs when needed. Individuals from the villages (women and men) will be encouraged to undertake marketing functions. Women, men or families will be helped in arranging for the purchase of chicks, feed packs, vaccines, and other inputs from the PRI and private sources and in reselling the inputs to the rest of the villagers. Private enterprise will be used to help ensure sustained and effective support to the women.

5. The marketing of eggs and broilers will be closely monitored. If a problem arises an attempt will be made to solve the problem by making arrangements with private merchants and other private buyers.

6. A process for ongoing monitoring and evaluation of the program will be introduced. A random sample of 20 participating women from each village will be selected for data recording. Simple forms for recording, on a weekly basis, egg production and use, poultry deaths, sale, purchase and consumption and the health care given will be provided. These data will be collected weekly and processed by the two village assistants under the supervision of the livestock assistant. Problems related to marketing, disease outbreak, input unavailability etc will be noted and concerned persons will be informed as soon as possible.

7. All activities, achievements, problems, modifications etc. will be fully documented and an a/v module will be developed to explain the program.

Monitoring and Evaluating:

Three types of data will routinely be collected and reported for the monitoring and on-going evaluation activity. These are:

1) Household level data concerning numbers of chickens owned, sold, purchased, consumed, hatched and died; number of eggs laid and eggs used, purchased, prices paid and received and health care given.

2) Village level data on number of participating women, number of chickens vaccinated and treated etc.

3) Community level information on activities carried out, visits, meetings, training, vaccinations etc; problems encountered - disease outbreak, shortages of inputs, marketing problems, any interventions taken to overcome the problems, and prices of eggs and broilers sold.

The main data collection activities will be the responsibility of two local women village assistants and one woman livestock assistant to be hired for the program for approximately 18 months. Supervising and training for the data collection and processing will be the responsibility of the MART consultant on women. She will also be responsible for the monthly report and the early and rapid conveyance of news of important problems to the individuals concerned.

Household Data Collection:

Methods Select a random sample of approximately 20 women from each village. The sample should be from women participating in the production program, those who purchased at least 6 chicks and who completed the village training.

Each woman will be given a data recording form to be completed weekly by a literate household member or with the help of a village assistant or livestock assistant. The form to be used "Form WHHO" is attached (Appendix A).

Village and Community Level Information

The forms for collecting the village and community level information are contained in Appendix B. these forms should be completed monthly but information about serious problems should be provided to Mrs. Bushra Tariq as soon as possible.

APPENDIX A

FATEHJANG WOMEN'S POULTRY PRODUCTION PROGRAM FORM WHHO

WEEKLY HOUSEHOLD DATA

Woman's Name _____ Village _____

I.D. Number _____ Week: from _____ to _____ _____
days month

POULTRY NUMBER

During the week how many:	Number	Breed	Sex	Age(mos.)	Price or Value
Died					
Were sold					
Were eaten					
Were purchased					
Were hatched					
Were in the stock at end of week					
Cause of deaths					

CONCENTRATED FEED PACKS FED DURING THE WEEK

Number	Price Paid	Place of Purchase

EGG LAYING AND USE

(Total Number for the week)

Laid: _____

Consumed: _____

Kept for hatching: _____

Sold: Number _____
Price/Doz _____

Broken or lost: _____

Health care and vaccinations given

Type of care or vaccine given	Number	Sex	Age	Source of medicine	Cost	Name and position of person giving treatment or care
1.						
2.						
3.						
4.						
5.						

2 VILLAGE AND COMMUNITY LEVEL INFORMATION

FATEHJANG WOMENS POULTRY PRODUCTION PROGRAM MANAGEMENT INFORMATION REPORT

These data will be reported monthly by the village and livestock assistants.

Village: _____

Period : _____ to _____ 19 ____

Report No. _____

A. STAFF ACTIVITIES

		COLUMN 1 This report	COLUMN 2 Total last report	COLUMN 3 Total (1+2)
1.	Visits of NARC scientists			
2.	Visits of PRI scientists			
3.	Visits of veterinaries			
4.	Number of new women participants			
5.	Number of women meetings conducted			
6.	Total number of women attending			
7.	Number of training/ demonstrations			
8.	Total number of women attending			
9.	Number of poultry treated by government staff			
10.	Number of poultry vaccinated by government staff			

B. INPUT USE AND SOURCE.

	INPUT	Total amount used or sold	Number of women buying	Input sources (1)	Cost per unit	Shortages (2) (Y/N)
1.	Fumi Chicks					
2.	Rafi Chicks					
3.	Concentrated Feed Packs					
4.	ND Vaccine					
5.	Powders and medicines					
	a) _____					
	b) _____					
	c) _____					
	d) _____					
6.	Other inputs for poultry					
	a) _____					
	b) _____					
	c) _____					
	d) _____					

1. Further explanation of input sources - village source - original source.

   1. _____
   2. _____
   3. _____
   4. _____

2. Explanation of any shortage problems which occurred.

C. PROBLEMS*

Topics	Definition and cause	Actions taken	Actions recommended
Lack of chicks			
Lack of inputs			
Diseases			
Fatalities			
Marketing			
Other (a)			
Other (b)			

* Serious problems should be communicated to Mrs. Bushra Tariq by telephone or other means as soon as possible.