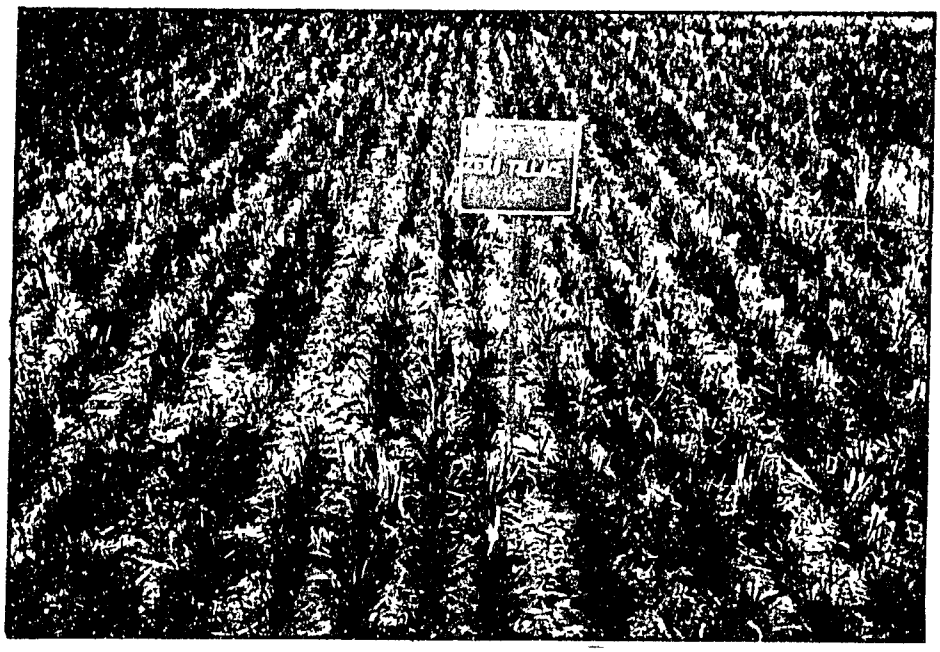
بسم الله الرحمن الرحيم

FARMING SYSTEM RESEARCH

SHAHKOT AREA



BY

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Faisalabad

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SHAHKOT AREA

MID-TERM REVIEW OF
FSR ACHIEVEMENTS
JANUARY, 1989

MART

Management of Agricultural Research and Technology Project

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MID TERM REVIEW OF THE MANAGEMENT OF AGRICULTURAL RESEARCH AND TECHNOLOGY(MART)PROJECT

INTRODUCTION

Farming systems approach has been developed to improve the efficiency and relevance* of the agricultural research system. In contrast to commodity or disciplinary approach, it encourages direct communication among research, extension and private agencies with farmer participation. Farming Systems Research identifies and addresses the priority problems perceived by farmers and research team as constraints to the entire farming system.

This helps ensure that the technology recommended to the farmers is suited to them. It means it will raise farm productivity and improve farmer welfare. Its methodology involves selection of target areas and farmers, identifying problems and opportunities, designing and executing on-farm research and evaluating and implementing the results. With this concept, this farmer-based and system-oriented coordinated programme of developing technologies, appropriate to farmer circumstances, was launched in 1986.

* Relevance means that the costs of any new inputs required by the improved technology must be either within the financial reach of most farmers or technology must offer sufficient returns to justify the use of credit to purchase the inputs.

According to the philosopy of FSR methodology a formal survey of the project area was carried out to collect information regarding site characterization by a multidisciplinary team consisting of biological and social scientists. From the information (see appendix) thus collected, many problems and constraints to production technology were identified.

Keeping in view the identified production problems and available technology. Research priorities were established and the FSR team scientists planned a research programme and executed it on the farmer's field, entirely under his conditions. The accomplishments made and targets achieved are briefly described down below:

IMPROVEMENT OF RICE-WHEAT SYSTEM

About 50 percent of wheat is sown after rice and its sowing is delayed due to find and long duration rice cultivars i.e. Basmati-Pak and Basmati-370, causing a substantial decrease in wheat yield. The possible option i.e. the introduction of an early-maturing, find rice variety seemed feasible. It was tested in the farmers' fields during the last two years in the project area, entirely under farmer's own conditions.

In the improved system, an early-maturing, shorter-duration variety Basmati-385 was sown, while in the traditional system rice variety Basmati-Pak was used. After harvesting rice crop, wheat was sown in the same fields. As Basmati-385 was harvested about 16 days earlier than Basmati-Pak the farmer was able to sow his wheat crop about 2 weeks earlier in the improved system.

The whole system was studied carefully. In the improved system, Basmati-385 not only matured about 2 weeks earlier but also produced significantly 0.40 tonnes more grain per hectare. In addition, the farmer also got the benefit of about 676 kg of additional wheat grain yield per hectare.

Partial budgeting showed that the farmer was able to increase his return above variable costs by about Rs.1363 per hectare from the improved practice.

INTRODUCTION OF LOW COST TECHNOLOGY

Labour and other inputs have become very expensive and are not within the reach of the poor farmer. Moreover, labour is not available at the critical stages. Therefore, low cost technology, if introduced can be one of the possible solutions.

Keeping this in view sowing of wheat through zero tillage without seed bed preparation after harvesting rice crop was introduced last year. Wheat crop was sown on four different sites in the project area and compared with the farmer practice.

Being a new technology, many problems cropped up which needed research and for this purpose, this technology is being tested at the Ayub Agricultural Research Institute, Faisalabad. However, the results obtained were very encouraging. Partial budgeting was done and it revealed that the farmer was able to increase his net income by about 24 percent, since it not only reduced the cost but also produced higher grain yield.

INCREASING FARM PRODUCTIVITY THROUGH LENTILS

Wheat being a staple food, the farmers try to bring maximum area under this crop but cannot afford inputs specially fertilizer and irrigation water in adequate quantities, as a result of which the yields are decreased.

Therefore, the option of introducing lentils in the existing wheat-based system seemed feasible since it requires comparatively low fertilizer and less number of irrigations.

It is not intended to replace wheat by lentils but it is suggested that some land out of the area under wheat be brought under this crop and the inputs, thus saved, when applied to wheat crop are likely to increase its yield and the income from lentils will be something additional.

Lentils were sown on three sites last year and the results were very encouraging. Partial budgeting showed that the farmer got an additional income of Rs.4000/- per hectare.

INCREASING CROPPING INTENSITY

Although the cropping intensity has increased upto 165 percent, still there are are certain areas where potential of increase still exists and one of the major areas where the research workers can contribute is the introduction of mungbeans in wheat-rice system.

About 80 percent of rice is sown after wheat. Harvesting of wheat starts from 15th of April but transplanting of rice begins after 15th of July in the project area. So the land reserved for rice in the wheat-rice system remains idle for about 2½ - 3 months, on which short duration mungbean varieties (60 days) can be raised easily without affecting the rice crop.

Last year, the mungbean variety 20-21 was sown after wheat and it matured in 65 days. The farmer was able to raise an additional crop of mungbeans, without affecting the yield of rice crop.

We hope that this intervention will go a long way is increasing net income of the farms.

CHEMICAL WEED CONTROL

Weeds, if not controlled, decrease yields upto 50 percent, depending upon the degree of infestation. Moreover, hand weeding has become expensive and is not always effective. Therefore, chemical weed control was introduced in the project area. Wheat, carrots and peas were the major crops on which herbicides were used and the results gained popularity specially in carrots where it is impossible to do manual weeding.

Economic analysis was carried out by partial budgeting technique. Cost benefit ratio was calculated and was found to be 1:29 in carrots and 1:26 in

in peas. The results in wheat were so encouraging that the farmers themselves purchased the weedicide and sprayed even the control plots.

LIVESTOCK COMPONENT

Livestock production is an essential agricultural activity and is highly integrated with crop production, crop residues being the single most important source of livestock feed. In turn, livestock supply draught power and manure to the crop production enterprises.

It was recognized that one of the most important factors responsible for low productivity and poor health of the livestock was the quantitative, as well as the qualitative shortage of feed and fodder with the small farmers.

Adequate green fodder is only available from March to April, when Egyptian clover is plentiful. A second period of good fodder availability lasts from mid-July to early September.

Therefore, based upon the priority of an identified problem of fodder crunch, focus was directed towards improving fodder situation in summer season.

Keeping this objective in view, a multicut kharif fodder, locally known as 'Sadabahar' (Sorghum-Sudan grass hybrid) was introduced and its performance was studied, entirely under farmer conditions.

Two years' results indicated it to be an efficient and cheap source of fodder supply. It produced 4 cuttings in summer season and both the lean periods of fodder crunch were covered. It provided about 92 percent more fodder than the conventional one.

OTHER RELATED ACTIVITIES

[1] Meetings with the farmers to create a sense of awareness through lectures, leaflets distribution and discussions.

[2] Health cover to the farm animals (large and small ruminants).

[3] Introduction of ensilage technique.

[4] Introduction of cheap and efficient cattle feed.

[5] Varietal improvement activities.

[6] Interventions on fertilizer and intercropping.

[7] Introduction of agro-forestory concept.

APPENDICES

NATURAL ENVIRONMENT

- **SOILS**

Clay	20.50%
Clay loam and loams	55.45%
Sandy and sandy loam	16.48%
Saline patches	7.57%

- **CLIMATE**

Average maximum temperature	38-39°C
Average minimum temperature	5.00°C
Average annual rainfall	516.4 mm
Variation/month in rainfall	173 - 2.5 mm

- **IRRIGATION SOURCE**

Irrigated by perennial canal supplemented by additions from SCARP tubewells- initially installed to reclaim the area.

SOCIO ECONOMIC SET-UP

- **MARKETING**

The project area is well connected by metalled roads to Dhaban Singh and Shahkot, the two main markets from where the farmers bring necessary inputs and eatables and take their farm produce to sell. In addition, there are well developed local markets for vegetables and other products.

- **LAND TENURE**

Tenants/owners	8.8%
Tenants	22.26%
Owners	64.15%

- **FARM SIZE**

< 5 acres	39.3%
5.1 - 10.0 acres	29.7%
10.1 - 15.0 acres	17.0%
15.1 - 20.0 acres	9.5%
> 20 acres	4.2%
Average	8.5 acres

- **FAMILY STRUCTURE**

Male	38.5%
Female	30.89%
Children	30.60%
Average family size	10.8%

- **WHOLE TIME WORK ON FARM**

Male	59.24%
Female	23.34%

- **CREDIT**

Not easily available

- **POWER SOURCE**

Owned animals	3.16%	82.10% use animals as power source partially or completely.
Owned animals and hired tractor	65.26%	
Owned animals and owned tractors	13.68%	
Hired tractor only	17.84%	

- **LAND OCCUPIED BY DIFFERENT CROPS**
  - **RABI**

Wheat	49.3%
Oilseeds	2.0%
Sugarcane	13.4%
Vegetables	3.4%
Fodder	11.4%
Fallow	20.1%

- KHARIF

Rice	16.25%
Sugarcane	12.95%
Cotton	7.54%
Maize	0.80%
Vegetables	9.85%
Fodders	10.70%
Fallow	32.85%

- IMPORTANT CROPPING SYSTEMS
  - RICE BASED

Wheat – Rice	80%
Fallow – Rice	15%
Vegetables & Fodders – Rice	7%

  - WHEAT BASED

Rice – Wheat	50%
Fallow ,Sugarcane,Maize – Wheat	30%
Cotton, Fodders, Vegetables – Wheat	20%

  - SUGARCANE BASED
    - AUTUMN

Fallow – Sugarcane	38%
Sugarcane – Sugarcane	38%
Kharif Vegetables & Fodder – Sugarcane	24%

    - SPRING

Fallow – Sugarcane	30%
Sugarcane – Sugarcane	20%
Berseem – Sugarcane(Intercrop)	50%

  - VEGETABLE BASED
    - RABI

Fallow – Vegetables	38%
Rice – Vegetables	12%
Vegetable,Cotto, Fodder – Vegetables	37%
Sugarcane – Vegetables (Intercrop)	13%

- KHARIF

Fallow – Vegetables	28%
Wheat – Vegetables	42%
Berseem – Vegetables	15%
Fodder, Cotton – Vegetables	15%

- CROPPING INTENSITY

RABI	79.92%
KHARIF	67.01%
OVER ALL	147.07%

- SOWING FREQUENCY

S.No.	Crop	Sowing frequency (%)
1	Wheat	96.84
2	Rabi Fodder	98.95
3	Rabi vegetables	44.21
4	Oilseeds	52.63
5	Cotton	42.10
6	Sugarcane	72.63
7	Rice	63.16
8	Kharif fodder	97.89
9	Kharif vegetables	46.31
10	Maize	9.47

- PEST CONTROLLING PRACTICES

S.No.	Crop	Kind of pesticide	Percent farmers using
1	Wheat	Arelon,Dicuran (Herbicides)	8.00
2	Sugarcane	Sumicidin	18.00
3	Rice	Machete (Herbicide)	12.50
4	Cotton	Sumicidin	50.00
5	Kharif vegetables (Brinjals)	Sumicidin	28.50

● YIELD AND FERTILIZER

S.No.	Crop	Average yield (acre)	Fertilizer (Kg/acre) N	P
1.	Wheat	22.69 md	37.23	18.55
2	Sugarcane	463.19 "	46.13	15.17
3	Rice	23.40 "	33.77	10.64
4.	Cotton	8.96 "	21.50	5.04
5	Rabi fodder	407.86 "	25.29	10.24
6.	Kharif fodder	261.91 "	24.59	3.02
7.	Rabi vegetables	Rs.3728.28	40.79	15.05
8	Kharif vegetables	Rs.3608.27	97.58	15.99
9	Maize	15.89 md	24.92	2.87
10.	Oilseeds	9.61 "	-	-

LIVESTOCK COMPONENT

Average herd consists of (Large ruminants)	Percent	Average number in the herd
● Buffallo (adult female)	32.23	1.76
● Cattle (adult female)	2.93	0.16
● Young stock(Buffalo+Cattle)	40.11	2.19
● Bullocks	21.43	1.17
● Buffalo(male)	3.30	0.18
Total:	100.00	5.46
Other kind of livestock		
● Goats		1.54
● Sheep		0.24
● Chicken		1.99
● Donkey		0.66

Percent female in milk	Average No. in the herd
• Buffalo	57.33
• Cattle	69.00

Average milk yield per animal/day	6.23 litres
Milk sales (Percent farms	11.33 "

PROBLEMS AND SOLUTIONS

Sr.No.	Production problems	Suggested potential solutions
1	Low crop yields due to:	
	[i] Weed infestation	Weed control by chemical & cultural practices
	[ii] Delay in wheat sowing	Improving rice-wheat system through early Basmati-385.
	[iii] Cultivation of inferior varieties susceptible to diseases and insect pests.	Varietal evaluation trials.
	[iv] Unbalanced use of fertilizer	Fertility experiments
2	Crunch of irrigation water and high input prices.	[i] Introduction of crops with less water requirements like Lentils and Gram.
		[ii] Improved management practices.
		[iii] Low cost technology.
3	Low farm income	[i] Improving cropping intensity in certain areas
		[ii] Intercropping pulses, vegetables & Oilseeds in sugarcane.
4	Acute shortage of fodder	[i] Improving fodder availability through multicut kharif fodder(S.S.Hybrid).
		[ii] Ensilaging surplus fodder.
5	Low productivity and poor health of farm animals	[i] Health cover.
		[ii] Introduction of cheap and cost efficient feed.
6	Ineffective extension services	Meetings with the farmers to create awareness about improved technology

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