

FARMER PARTICIPATORY PROBLEM IDENTIFICATION: A CASE STUDY OF KARNAL DISTRICT, HARYANA

S R K Singh¹, Arindam Dhal², Debashish Manda³ and Vinod Bhargav⁴

Adequate food grain production (212 million tonnes) along with sufficient buffer stock (70 million tonnes) is a testimony of an effective agricultural research and extension system in India. This success can be attributed to the relentless efforts made by the scientists, extensionists, farmers and development agencies towards agricultural development. The ultimate goal of the National Agricultural Research System in India is to develop the most suitable technologies for the end-users through its multi-location research. Further, technological advancement in agriculture is aimed at increasing production efficiency with higher returns to the Indian farmers.

In agriculture, extension research is an important segment and it helps in the study of the efficacy and impact of different technologies developed and transferred to the farmers. Besides, it helps in the development of new technologies based on the needs and problems faced by the farmers. The research findings and other relevant information are passed on to the extensionists for transferring it to the farmers. The farmers' problems and constraints in the adoption of advanced techniques are fed back to the scientists/researchers in order to develop need-based technologies. But, in reality the functional linkage is not very strong, and researchers are not habitual in using the feedback given by the extension workers and other field level functionaries for developing relevant research agenda.

At present, agricultural scientists working in the Indian Council of Agricultural Research (ICAR) and State Agricultural Universities (SAUs) are directed to improve their work efficiency in such a way that India would be able to feed its teeming population and cater to the needs of other developing countries too. The available agricultural lands have been almost saturated for higher production. Therefore, it is necessary to increase the productivity of crops through conducting location-specific research and crop diversification. Keeping this in view this study was conducted by a multidisciplinary team of trainee-scientists to identify the agricultural and allied problems faced by the farmers through Participatory Rural Appraisal (PRA) techniques.

Methodology

This study was conducted during October-November, 2002, as a part of the Field Experience Training (FET) at Uchana village in Karnal district of Haryana

¹ Scientist (Agri Extn), Vivekanand Institute of Hill Agriculture, Almora (Uttaranchal)-263 601 (INDIA)

² Scientist (LPM), National Research Centre on Mithun, Nagaland

³ Scientist (SWCE), Central Soil and Water Conservation Research and Training Institute, Dehradun

⁴ Scientist (FMP), Central Institute of Post harvest Engineering & Technology, Ludhiana (Punjab)



State. Uchana has a total area of 879 ha, out of which 75.0 per cent is irrigated, and is located 13 km from Karnal city. The village is located at latitude 29° 43' N, longitude 76° 58' E and altitude 245 m. The average rainfall is 835 mm/year, average annual temperature ranges from 16.9°C to 30.0°C, and relative humidity is 67.0 per cent.

Amongst several techniques under PRA, Preferential Ranking Technique was used to identify the topmost agricultural problems faced by the farmers in the village. Thirteen Key Informants and 17 farmers were interviewed thoroughly to identify the problems in agriculture and allied sectors faced by the villagers. Ten problems were listed according to the farmers' perception. Then they were asked to rank them between 1 and 10 according to their importance. They were also asked to indicate the extent of damage in terms of acreage of crops affected in the village for crop production and the number of animals affected by the respective problems. Information on the average monetary loss for the village by each problem was also elicited from the farmers for each problem. Frequency of each rank was calculated for the entire ten problems. The following steps were followed to apply the Preferential Ranking Technique (Sabarathnam, 1988):

Step I- Identification and selection of key informants

Key informants (KIs) are a very important segment for successful completion of any PRA technique. They are the resource persons and are well conversant with their village situation. They are mostly the opinion leaders of their social systems. They happened to be gram pradhans, progressive farmers, local leaders etc. After identification, they were asked individually to list the problems faced by the villagers in relation to agriculture. The problems were enlisted and scored by the key informants. According to the scores the problems were ranked.

Step II- Calculation of economic loss

The farmers identified through the KIs were also asked to list out the problems faced by them, along with their economic importance for their farming situation. The extent of loss or damage due to the prevailing problems was worked out by using the formula given by Kumar and Roy (1990):

$$\% \text{ Loss/Damage} = \frac{\text{No. of attacked units}}{\text{Total no. of units}} \times 100$$

The loss due to each of the listed problems was estimated in actual field condition. The average yield loss percentage was estimated by thorough discussion with the farmers along with KIs.

Step III- Calculation of RBQ, VMV and VBI:

The collected data were quantified by ranking the problems based on the information obtained from the key informants.

Rank Based Quotient (RBQ):

The RBQ was calculated by using the following formula:

$$\text{RBQ} = \frac{\sum f_i(n+1-i) \times 100}{N \times n}$$

Where,

i = Concerned ranks (1 to 10)

N = Total numbers of farmers (13)

n = Numbers of problems (10)

f_i = Frequency (Number of farmers reporting that particular problem under i^{th} rank)

Village Magnitude Value (VMV) of the problem

The magnitude of the identified problems was estimated by the following formula:

VMV = RBQ X Area affected (acre/hectare) or Number of animals affected

Value Based Index (VBI):

VBI was worked out using formula:

$$\text{VBI} = \text{VMV} \times \text{Average loss experienced}$$

The problems were then ranked based on VBI value as given in Table 3.

Results and Discussion

Utilizing Preferential Ranking Technique, the major problems faced by the Uchana village farmers and the extent of damage due to these problems were identified. Around 15-20 problems were listed out by the farmers, out of which ten were selected for further analysis (table 1). The problem of pest and diseases in rice ranked first with maximum VBI of 1181520, followed by Marketing problem with VBI 508815 and weeds in wheat with VBI 291696. Besides, the farmers faced scarcity of water as the ground water level has been going down due to over exploitation. The electricity problem was not considered, though it affects agricultural operations directly, as it does not come under agricultural research purview. The five topmost problems identified are:

Table 1: Ranking of problems by farmers

Problems	Key Informants												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Pest and disease in rice	1	2	1	1	1	1	1	2	1	1	1	1	1
Weeds in wheat	4	4	6	8	7	3	3	1	8	3	4	8	5
Insect and disease in sugarcane	5	6	5	4	4	4	6	6	5	5	7	4	6
Marketing problem of agricultural produce	6	5	2	2	2	2	5	5	2	2	2	3	7
Uneven crop stand (Spatial variability)	2	1	10	9	8	5	4	10	4	9	9	9	10
Scarcity of electricity	7	3	3	3	3	7	2	3	3	4	3	2	2
Ground water depletion	3	10	9	10	6	6	7	8	7	8	10	7	9
Season adaptability problem in cows and buffalo	8	8	4	7	5	8	10	9	6	6	5	5	3
Green fodder scarcity in summer	9	9	7	5	10	9	8	7	10	7	6	6	8
Infertility problem in cattle and buffalo	10	7	8	6	9	10	9	4	9	10	8	10	4

1. Pest and diseases in rice
2. Marketing problem of agricultural produce
3. Weeds in wheat
4. Seasonal adaptability in cows and buffaloes
5. Infertility problem in cattle and buffalo

Although the farmers were using a considerable amount of pesticides in rice, they were not able to protect their crop. Marketing of agricultural produce is a serious problem for them. They were not getting a remunerative price for the produce as per their expectations. Government agencies like the Food Corporation of India, State Food Corporation, etc. were not taking their agricultural produce at the right time, which resulted in distress sale of the produce at lower price to middleman (*arhatia*) in local markets (*mandis*). There were two problems related to animal husbandry, both came below five in rank analysis. Seasonal adaptability was the major problem for animals as they adopted crossbred animals.

Farmers Ranking (Qualitative Assessment):

The ranking given by key informants is given in table 1. A perusal of the data indicates that on the basis of calculated VBI, the problem of pest and disease was given the top rank by 11 key informants and marketing problem of agriculture produce was ranked second by 7 key informants. Scarcity of electricity was ranked second by 3 KIs and third by 7 KIs. Thus the majority of the respondents identified pest and disease as the major problem.

Utility of RBQ, VMV and VBI (Quantitative Assessment):

Based on the ranks given by the key informants for different problems and their frequency distribution (table 2) the RBQ was calculated. The area affected, average loss and village magnitude value and value based index for the identified problems are shown in table 3. From the analysed data, it could be inferred that the calculated RBQ values ranged from 98.46 to 30.00 per cent. Thus, RBQ was the highest for pest and disease in rice. It can be observed from the table that RBQ, VMV and VBI values are the highest in the pest and diseases problem in rice. Thus, it could be inferred as the topmost problem of Uchana village.

Based on the problems identified, the farmers were advised for corrective action, so that they could get regular profit from their farming and conserve natural resources like soil, water, etc. During the entire PRA exercise, the participating farmers were asked to contribute to realising sustainable agriculture by conserving the resources for future generations.

Table 2: Frequency distribution of the ranks

Problems	Key Informants									
	1	2	3	4	5	6	7	8	9	10
1 Pest and disease in rice	11	2								
2 Weeds in wheat	1		3	3	1	1	1	3		
3 Insect and disease in sugarcane				4	4	4	1			
4 Marketing problem of agricultural produce		7	1		3	1	1			
5 Uneven crop stand (Spatial variability)	1	1		2	1			1	4	3
6 Scarcity of electricity		3	7	1			2			
7 Ground water depletion			1			2	3	2	2	3
8 Season adaptability problem in cows and buffalo*		1	1	3	2	1	3	1	1	
9 Green fodder scarcity in summer					1	2	3	2	3	2
10 Infertility problem in cattle and buffalo				2		1	1	2	3	4



Table 3 : Magnitude of the problems in Uchana Village

Identified problems	RBQ	Magnitude of loss (Area in acre/ no of animals)	Average % Loss	VMV	VBI	Rank
Pest and disease in rice	98.46	300	40	29538	1181520	I
Weeds in wheat	60.77	240	20	14584	291696	III
Insect and disease in sugarcane	58.46	20	30	1169	35076	VI
Marketing problem of agricultural produce	75.38	225	30	16960	508815	II
Uneve crop stand (Spatial variability)	40.76	30	10	1223	12230	VIII
Scarcity of electricity	75.38	-	-	-	-	-
Ground water depletion	42.30	30	5	1269	6345	IX
Season adaptability problem in cows and buffaloes	45.38	72	60	3267	196042	IV
Green fodder scarcity in summer	32.30	70	10	2261	22610	VII
Infertility problem in cattle and buffalo	30.0	50	30	1500	45000	V



Conclusion

In order to sustain Indian agriculture, the problems faced by the farmers in their farming operations need to be addressed properly. Some eco-friendly solutions should be provided to these farmers to safeguard the environment which could be beneficial for farmers too. Further, to protect the crops from pest and diseases, farmers could be advised and trained in using bio-pesticides and other organic products. Such practices will be an additional step towards sustainable agriculture. Thus, through this PRA exercise, the farmers got technical help at their doorstep, whereas the participating trainee-scientists got acquainted with the village conditions and agricultural problems in actual field situation.

References

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