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Research Prioritization through Identification of Production Constraints in Agriculture

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ABSTRACT

A study was conducted to determine the willingness of farmers to participate in the process of identification and prioritization of agricultural problems for research and extension intervention. The study concluded that the level of farmers' involvement in identification and prioritization of agricultural problems was low. Among all the highlighted problems, soil sodicity (21 farmers ranked it as 1) was the most important, followed by blue bulls attack (18 farmers ranked it as 1). The value based index (VBI) was highest for soil sodicity, followed by blue bulls attack, heat detection problem in buffaloes, motha infestation in rice, animal infertility, late adoption of technologies and Phalaris minor. The VBI was based on maximum number of responses given by the farmers for respective problems and therefore needs urgent attention in respect of research and extension outreach. Thus, the issues should be given priority in research, development schemes and policy. Developmental policies should be implemented using bottom-up rather than the top-down approach so that farmers' opinion would be involved solving the problems well in time.

Overall development of economy depends on the development of all the sectors. In agrarian economy, agriculture sector is called as backbone of economy. In general, the agriculture faces, number of constraints and if solutions are provided to these constraints/obstacles, this sector and overall economy develop faster. The economic development of region has relationship with different dimensions as productivity, production conditions, agrarian relations and agricultural change including infrastructure (Singh 1985 and Raza 1981). Among other factors, the good social network in village also plays an important role in development of agricultural society.

A study was conducted in village Ismailpur in Dulhapur-Husainabad village panchayat of Gosaiganj block of Lucknow in 2009-10 to find the constraints in agricultural development. The village is situated at 26° 37.227'N Latitude and 81° 07.223'E Longitude, at an altitude of 103 m from mean sea level (MSL). The area receives annual rainfall of 1020 mm. The total area of the village is 154.75 ha with net cultivated area of 137.5 ha, fully irrigated through canal. The number of households in the village is 233 with total population of 1017. Because of availability of canal irrigation, the major cropping pattern is Rice-Wheat–Mentha. Some farmers also grow vegetables due to availability of water and vicinity of markets. The average yield of rice, wheat and mentha was 43 qha^{-1}, 32 qha^{-1} and 80lha^{-1}. The livestock population in the village included 200 buffaloes, 185 cattle and 40 goats.

Keywords: Constraints, research prioritization, agricultural development

MATERIALS AND METHODS

The constraints in agriculture were identified with participation of farmers and 30 farmers were asked to give ranks on the basis of severity of problem. 5

key informants (KIs) from the village, representing different socio-economic strata and well informed about the agricultural enterprises were identified to get unbiased and firsthand information about the farming community. At the first instance, each KI was asked to list down the 10 major agricultural problems. During the second step, the 10 most common problems were ranked based on the farmer's perception. After the ranking of identified problems, the farmer was asked to nominate another farmer who can further rank these problems. This method is called snowball technique. Likewise, the procedure was repeated till 30 farmers ranked the most common agricultural problems of the village; Rank 1 for most important. The average yield loss experienced by the farmers because of a particular problem taking both main and bi-products into consideration was estimated. For a crop, the estimation was done on the basis of acreage affected, whereas for livestock, the problem was assessed based on the number of animals affected in the village. The loss in gross income due to a particular problem was calculated per unit by using the following formula:

Price of main product × Average yield loss + Price of bi-products × Average yield loss

Further, the constraints in agriculture were ranked based on Rank based Quotient (RBQ) as given below:

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

i = Concerned rank (1 to 10)

N =Total no. of farmers (30)

n = No. of ranks (10 ranks, n =10)

f_i = Number of farmers reporting particular problem under ith rank

Each rank calculated separately and summed up to get RBQ value (for 1 to 10 ranks)

In order to identify the most important problem, *Value Based Index* (VBI) for each problem was calculated separately as given below:

VBI = RBQ × Total economic loss experienced by the problem at the village level (Price of the main product × Average yield loss + Price of the bi-products × Average yield loss per acre or per animal or per unit enterprise × Total affected area (in acres) or animals or unit enterprises in the village.

The problem that has the maximum VBI was the most important problem to be tackled first.

RESULTS AND DISCUSSION

Prioritising of agricultural problems

Among the most significant problems faced in the agriculture sector, soil sodicity was the top most problem ranked as 1 by 21 farmers; followed by blue bulls attack, ranked as 1 by 18 farmers. As per the rank based quotient (RBQ) also, the soil sodicity was among the top most problem with rank of 94.07, followed by blue bulls attack with RBQ of 90.37 (Table 1). The lowest RBQ i.e. 61.48 was estimated for the problem of stem borer (Fig. 1).

Table 1: Identification of agricultural problems and associated ranks

Problem	Farmer's response according to ranks								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Soil sodicity	21	4	3	2	–	–	–	–	–
Blue bulls attack in crop fields	18	5	2	4	–	1	–	–	–
Heat detection in buffaloes	14	3	4	3	–	4	2	–	–
Motha infestation in rice	12	4	3	3	2	2	2	1	1
Animal Infertility	14	5	4	4	1	2	–	–	–
Late adoption of technologies	10	5	4	2	1	1	2	2	3
Phalaris minor in wheat	7	5	4	3	3	2	2	2	2
Animal diseases	9	4	5	4	–	–	4	2	2
Stem borer in rice	5	4	4	3	2	2	4	3	2

Similarly, the value based index (VBI) was also calculated for different problems (Table 2). The percentage loss was analyzed for different problems and monetary loss per hectare/animal was calculated. Then the value based index was calculated and ranks are given to the problems on the basis of VBI. The highest VBI is given first rank and which requires urgent attention for solution from researchers/ policy makers/development agencies (Uzunlu 1999). The issues identified through VBI should be

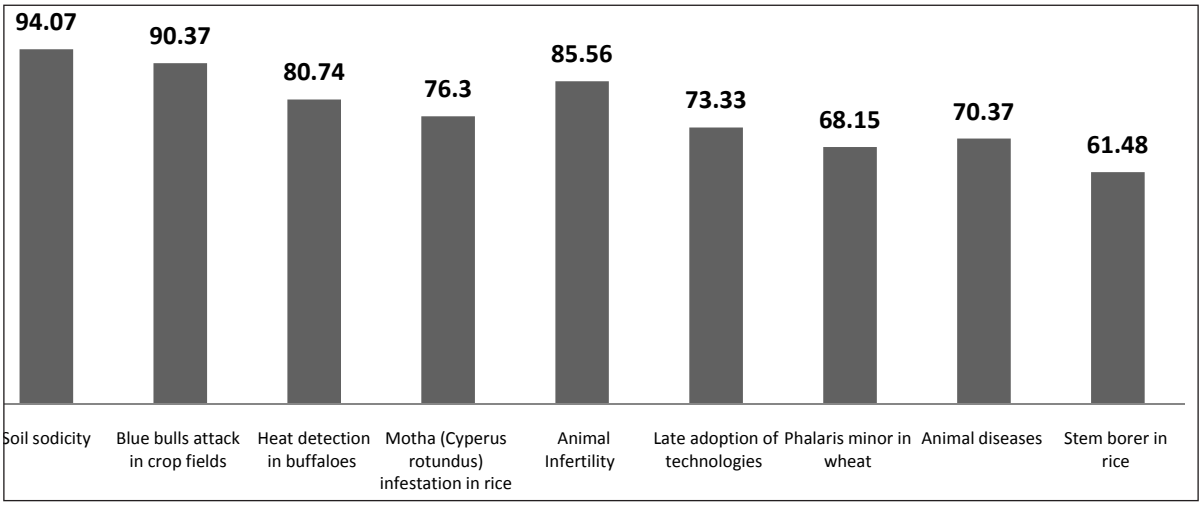

Fig. 1: Rank Based Quotient of agricultural problems

Table 2: RBQ, Economic loss, Value based Index (VBI) and ranks of identified problems

Problems	RBQ	Percentage Loss	Monetary loss per ha./animal (₹)	No. of ha./ animals affected	VBI	Ranks
Soil sodicity	94.07	30	44,000	70	289735600	1st
Blue bulls attack in crop fields	90.37	15	20,000	100	180740000	2nd
Heat detection in buffaloes	80.74	20	2200	100	17762800	3rd
Motha infestation in rice	76.30	10	3600	120	32961600	4th
Animal Infertility	85.56	15	3000	25	6417000	5th
Late adoption of technologies	73.33	5	2000	25	3666500	6th
Phalaris minor in wheat	68.15	5	1600	20	2180800	7th
Animal diseases	70.37	5	1000	30	2111100	8th
Stem borer in rice	61.48	5	1800	10	1106640	9th

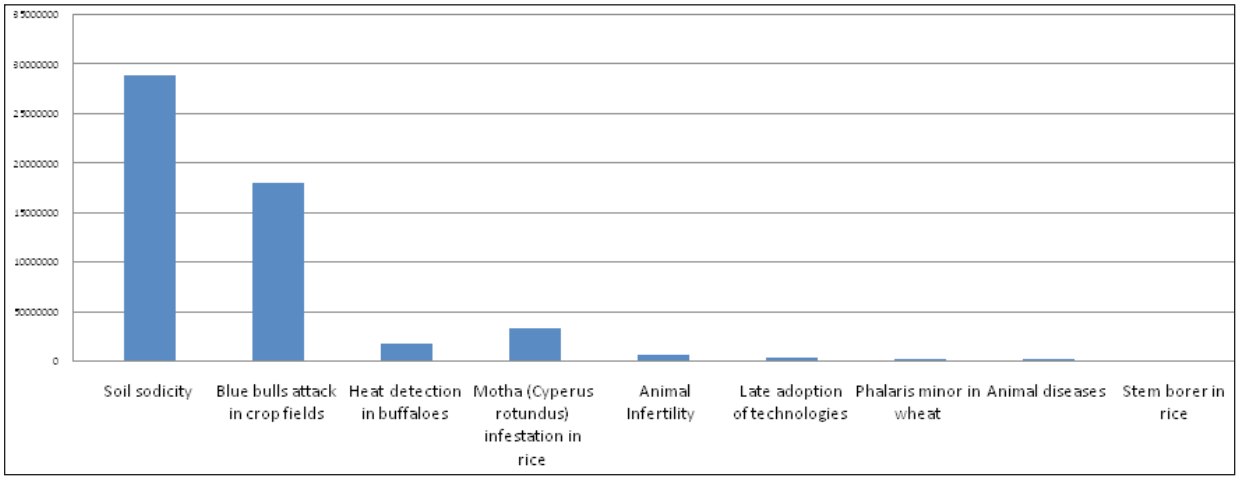

Fig. 2: Problems and research prioritization on the basis of VBI

given priority in research, development schemes and policy (Apantaku 2003). The VBI was highest for soil sodicity, followed by blue bulls attack, heat detection problem in buffaloes, motha (*Cyperus rotundus*) infestation in rice, animal infertility, late adoption of technologies and Phalaris minor (Fig. 2).

CONCLUSION

The study concluded that the level of farmers' involvement in agricultural problems identification and prioritization was low. Farmers were willing to be involved in highlighting the agricultural problems faced by them. The VBI was highest for soil sodicity, followed by blue bulls attack, heat detection problem in buffaloes. Sometimes the technologies disseminated were not in the priority list of farmers and felt needs. The technology driven development process will be cost effective and will have wider adoption. Some of the constraints that might have militated against farmers' involvement were poor motivation and encouragement of farmers by researchers and extension officers, lack of adequate knowledge of research and extension processes, ineffective and inefficient linkages between farmers and extension agents and lack of formal education by farmers. Developmental policies should be implemented in a bottom-up approach rather than a top-down approach so that farmers' opinion would be known and problem is solved in time.

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