Gaurav Tomer
Research Scholar, Department of Agriculture Economics and Statistics, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Birendra Kumar
Assistant Professor, Department of Agriculture Economics and Statistics, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Bhartendu Yadav
Teaching Associate, Department of Agriculture Economics and Statistics, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Debabrata Swain
Research Scholar, Department of Agriculture Economics and Statistics, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Harendra Pratap Singh Choudhary
Teaching Associate, Department of Agriculture Economics and Statistics, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Abhishek Singh
Research Scholar, Department of Agriculture Economics and Statistics, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Corresponding Author:
Gaurav Tomer
Research Scholar, Department of Agriculture Economics and Statistics, Chandra Shekhar Azad University of Agriculture & Technology, Kanpur, Uttar Pradesh, India

Constraints associated with different enterprises performing in farming systems in western plain zone of Uttar Pradesh, India

Gaurav Tomer, Birendra Kumar, Bhartendu Yadav, Debabrata Swain, Harendra Pratap Singh Choudhary and Abhishek Singh

Abstract
India is the major producer of cereals, oilseeds, sugarcane and livestock. The wheat, paddy, sugarcane, and mustard are the major crops cultivated in all over the Uttar Pradesh. The present study was conducted to identify the constraints faced by the farmers under practised different crops and livestock in Western Plain Zone of Uttar Pradesh. The study was carried out in fifteen villages of three sampled districts of WPZ of Uttar Pradesh using Multistage purposive cum random sampling. Results reveal that the major constraints expressed by the farmers in crop production was loss by stray animals, high number of Spray of chemicals and fertilizer increased cost, long repetition of single variety, high labour charges, high charges of chemicals, unavailability of fertilizers on need, delay in payments and lack of high milking breeds in livestock production etc.

Keywords: Constraints, western plain zone, farming system, random sampling

Introduction
Agriculture is a field-based practice and the production of crops and other enterprises is determined by many factors. Many of them cannot be controlled by human beings. So, problems always persist in the performance of various enterprises. Indian agricultural production increasing at a high rate over the last four decades. Post-Independence, Indian agriculture transformed from a food-scarce to food-exporting country primarily due to new age innovations in farming that caused a multi-fold increase in agricultural production from 135 million tons in 1950-51 to over 1300 million tons in 2021-22 despite increasing abiotic and biotic stresses and depleting along with deteriorating natural resources. (Pathak H, *et al.* (2022) [5].

A farming system is a complex inter-related set of elements containing crops, livestock, poultry, fish, sericulture, vermin-compost, sheep and goats, etc. which interact among themselves. (Sachin Kumar, 2012) [8]. As we are aware about, the gaps between yields obtained at research trails and farmer's fields still exist under at least all enterprises. By filling of these gaps could improve not only the productivity but also the efficiency of the major enterprises. To minimize the gap and improve productivity as well as efficiency, we need to know the constraints/problems faced by the farmers during the production of major crops and enterprises. (Raghav S, and Sen C, 2014) [7]. The efficiency of the farming systems is depended upon the area-specific selection of enterprises and the selection of enterprises is quite complex for a farmer. The majority of the farmers are resource-poor and have small and fragmented landholdings in India. (Bhutia, *et al.*, 2017) [1]. When researchers interact with farmers, they reported problems with the production of different crops and the rearing of livestock, fish, poultry, sheep and goats. The main objective of this study is to analyse the constraints faced by the farmers in the cultivation of major crops and livestock using a case study of WPZ of Uttar Pradesh. Keeping this in view the above study was performed to highlight the constraints faced by the farmers across different farming systems.

Methodology

Multistage purposive cum random sampling has been adopted for the selection of districts, blocks, villages and farmers in the Western Plain Zone of Uttar Pradesh due to the diversity seen there in the farming systems, cropping pattern and livestock productivity. Among the eight districts of WPZ Saharanpur, Meerut and Bulandshahar, were selected due to the rich farming system dominance in the area (District profile, KVK Bulandshshar, Meerut and Saharanpur). Similarly total three blocks, one block from each district has been selected based on the area present of major crops i.e., paddy, wheat, sugarcane, mustard, sorghum (fodder) and livestock. Likewise, a total of fifteen villages and 270 farmers of different categories were selected based on probability proportion to the number of major crop growers for the study. The identification of constraints associated with the crops was done by the constraints shared by the respondents while data collection. Data was analysed and results were interpreted with the incorporations of Simple tabular analysis using frequencies (n) and percentages of descriptive statistics in the study.

Results

As per the data analysed, the results are presented in tabular presentations, with the help of frequencies and percentages of descriptive statistics. Several constraints were identified by the different farmers of selected enterprises in the study area. For constraints associated with the paddy, wheat, mustard, sugarcane, sorghum, and livestock 117, 270, 117, 153, 270 and 270 farmers responded over constraints associated with them respectively. The numbers of major constraints identified by the selected crops and livestock were 13, 10, 5, 13, 7, and 7 in numbers respectively.

Results interpreted on an overall average, from Table 1 reveal that, among the identified constraints by the paddy growers, the problem of losses by stray animals (n = 117 & 100 per cent) was found on the first position, problem of the cost incurred in fencing for control of stray animals (N = 114 &

97.43 per cent) on the second and on the third was problem of high labour cost (N = 111 & 94.87 per cent). Table 2 reveals that, among the identified constraints by the wheat growers, the problem of losses by stray animals (N = 250 & 92.59 per cent) was found on the first position, the the problem of the additional cost of fencing due to stray animals (N = 238 & 88.15 per cent) on the second position and problem of unavailability of new released variety seeds at local level (N = 224 & 82.96 per cent) was found on the third position. Table 3 reveals that, among the identified constraints by the mustard farmers, the problem of best variety seeds (N = 112 and 95.73 per cent) was found on the first position, then the problem of high harvesting charges (N = 101 & 86.32 per cent) was on the second position and problem of lack of information about HYV and their seeds/planting materials (N = 90 & 76.92 per cent) was found on the third position. Table 4 reveals that, among the identified constraints by the sugarcane farmette rs, the problem of state advisory price, not increasing from the last three years (N = 153 & 100 per cent) was found in the first position, the problem of losses by stray animals (N = 150 & 98.04 per cent) on the second position and problem of high cost over chemicals and fertilizer use along with high labour charges (N = 138 & 90.20 per cent) was found on the third position. Table 5 reveals that, among the identified constraints by the sorghum growers, the problem of losses by the stray animals (N = 246 & 91.11 per cent) was found in the first position, then the additional cost of fencing due to stray animals (N = 229 & 84.81 per cent) was found on the second position and problem of identification of seeds (N = 215 & 79.63 per cent) was found on the third position. Table 6 reveals that, among the identified constraints by the livestock holders, the problem of high cost of feed and concentrate (N = 231 & 85.55 per cent) was prominent, then the problem of low productivity of milch animals (N = 222 & 82.22 per cent) was on the second position and problem of long-distance of government veterinary services (N = 212 & 78.52 per cent) was found on the third position.

Table 1: Constraints faced by farmers in the production of Paddy

S. No.	Constraints in Paddy Production	Marginal (70)		Medium (36)		Large (11)		Overall (117)	
		N	%	N	%	N	%	N	%
1	Lack of information about high-yielding varieties and their seed/ planting materials	62	88.57	27	75	9	81.82	98	83.76
2	High cost of quality seeds	38	54.28	32	88.88	7	63.64	77	65.81
3	High cost of potassium fertilizers	46	65.71	26	72.22	4	36.36	76	64.95
4	Non-availability of fertilizer when needed	61	87.14	34	94.44	10	90.91	105	89.74
5	Manual weeding is time-consuming and labour intensive	36	51.43	25	69.44	4	36.36	65	55.55
6	Less effective and costly weedicides	45	64.28	30	83.33	5	45.45	80	68.38
7	High cost of quality plant protection chemicals	65	92.86	34	94.44	8	72.73	107	91.45
8	Loss by stray animals	70	100	36	100	11	100	117	100
9	Lack of credit	27	38.57	14	38.89	2	18.18	43	36.75
10	Unavailability of labour when need	48	68.57	29	80.55	10	90.91	87	74.36
11	High labour cost	67	95.71	36	100	8	72.73	111	94.87
12	High no of Sprays of chemicals and fertilizer increase the cost	53	75.71	32	88.89	9	81.82	94	80.34
13	The additional cost of fencing due to stray animals	68	97.14	36	100	10	90.91	114	97.43

Table 2: Constraints faced by the farmers in Wheat cultivation

S. No.	Constraints in Wheat Production	Small (166)		Medium (81)		Large (23)		Overall (270)	
		N	%	N	%	N	%	N	%
1	High cost of quality seeds	155	93.37	52	64.20	12	52.17	219	81.11
2	Unavailability of newly released variety seeds at local level	146	87.95	63	77.78	15	65.22	224	82.96
3	The additional cost of fencing due to stray animals	153	92.17	67	82.72	18	78.26	238	88.15
4	Loss by stray animals	161	96.98	69	85.18	20	86.96	250	92.59
5	Unavailability of fertilizers on need	113	68.07	56	69.13	21	91.30	190	70.37
6	High cost of quality plant protection chemicals	125	75.30	73	90.12	8	34.78	206	76.30

7	High no of Sprays of chemicals and fertilizer increase as cost	132	79.52	49	60.49	7	30.43	188	69.63
8	Less effective and costly weedicides	98	59.04	42	51.85	10	43.48	150	55.55
9	Unavailability of labour when need	102	61.44	46	56.79	6	26.09	154	57.04
10	High cost of manual harvesting	126	75.90	68	83.95	13	56.52	207	76.67

Table 3: Constraints faced by farmers in mustard production

S. No.	Constraints in Mustard Production	Small (70)		Medium (36)		Large (11)		Overall (117)	
		N	%	N	%	N	%	N	%
1	Identification problem of best variety seeds	68	97.14	34	94.44	10	90.91	112	95.73
2	Lack of information about high-yielding varieties and their seed/ planting materials	58	82.86	25	69.44	7	63.64	90	76.92
3	Loss by stray animals	52	74.28	24	66.67	6	54.54	82	70.08
4	The additional cost of fencing due to stray animals	51	72.86	24	66.67	6	54.54	81	69.23
5	High harvesting charges	67	95.71	26	72.22	8	72.73	101	86.32

Table 4: Constraints faced by farmers in the cultivation of sugarcane

S. No.	Constraints in Sugarcane Production	Small (96)		Medium (45)		Large (12)		Overall (153)	
		N	%	N	%	N	%	N	%
1	Long time repetition of one variety showing (Co-0238)	87	90.62	34	75.55	8	66.67	129	84.31
2	High cost of plant protection chemicals	73	76.04	32	71.11	9	75	114	74.51
3	High cost of fertilizers used	55	57.29	28	62.22	6	50	89	58.17
4	Loss by stray animals	94	97.92	44	97.78	12	100	150	98.04
5	The additional cost of fencing due to stray animals	92	95.83	41	91.11	11	91.67	144	94.12
6	Unavailability of quality planting material in local place	78	81.25	40	88.89	10	83.33	128	83.66
7	Unawareness about the best pesticides for the first crop and second crop	52	54.17	23	51.11	6	50	81	52.94
8	High no of Sprays of chemicals and fertilizer increase the cost	91	94.79	39	86.67	8	66.67	138	90.20
9	Less effective and costly weedicides	45	46.87	25	55.55	6	50	76	49.67
10	High labour charges	88	91.67	40	88.89	10	83.33	138	90.20
11	High cost of potassium fertilizers	65	67.71	41	91.11	9	75	115	75.16
12	Manual weeding is time-consuming and labour intensive	76	79.17	38	84.44	8	66.67	122	79.73
13	State advisory price is not increasing in the last three years	96	100	45	100	12	100	153	100

Table 5: Constraints in the production of Sorghum (fodder)

S. No.	Constraints in Sorghum (fodder) Production	Small (166)		Medium (81)		Large (23)		Overall (270)	
		N	%	N	%	N	%	N	%
1	Identification problem of seeds	136	81.93	63	140	16	133.3	**215**	79.63
2	High cost of quality seeds	123	74.10	52	115.55	11	91.67	186	68.89
3	Germination problem of seeds	113	68.07	58	128.89	8	66.67	179	66.30
4	Loss by stray animals	152	91.57	74	164.44	20	166.6	246	91.11
5	The additional cost of fencing due to stray animals	144	86.75	68	151.11	17	141.6	229	84.81
6	Unavailability of multi-cutting varieties in the local area	97	58.43	61	135.55	14	116.6	172	63.70
7	Unavailability of fertilizers on need	121	72.89	13	28.89	4	33.33	138	51.11

Table 6: Constraints faced by farmers/producers in livestock rearing

S. No.	Constraints in Livestock Production	Small (166)		Medium (81)		Large (23)		Overall (270)	
		N	%	N	%	N	%	N	%
1	Low productivity of milch animals	132	79.52	76	93.83	14	60.87	222	82.22
2	Irregularity in the availability of green fodder over the year	124	74.70	45	55.55	2	8.69	171	63.33
3	Lack of high-milking breeds	147	88.55	49	60.49	15	65.22	211	78.15
4	Long distance of govt. veterinary services	136	81.93	64	79.01	12	52.17	212	78.52
5	High cost of feed and concentrate	141	84.94	71	87.65	19	82.61	231	85.55
6	Lack of awareness about vaccination timing	122	73.50	52	64.20	11	47.83	185	68.52
7	The cost of medication is very high	115	69.28	42	51.85	16	69.56	173	64.07

Conclusion

As per the results drawn from the data interpreted with the help of a tabular presentation of the different constraints associated with the different enterprises in the study area, it can be concluded that the problem of losses by stray animals was found on a prominent position in the majority of enterprises i.e., paddy, wheat, and sorghum in the study area. Whereas, for the other three selected enterprises i.e., mustard, sugarcane and livestock problems of best variety seeds, state advisory price not increasing from last three years, lack of high milking breeds and high cost of feed and concentrate were found prominently in the study area.

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