

Constraints faced by farmers in different farming systems prevailing in Nagaur district of Rajasthan

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ABSTRACT

The present study was conducted in Nagaur district of Rajasthan. A sample of 60 respondents spread over four villages from two Tehsils, Merta City and Riyan Badi of the district were selected for the study. It was to identify the prevailing farming systems and constraints faced by farmers in different farming systems. Four farming systems existed in both rainfed and irrigated situations of Nagaur district viz FS-I (crop + dairy), FS-II (crop + dairy + goat), FS-III (crop + dairy + goat + sheep) and FS-IV (crop + poultry). Under both rainfed and irrigated situation, FS-I was being adopted by maximum number of farmers whereas minimum number of farmers adopted FS-IV. The major constraints under rainfed situation in crops and livestock enterprises were reported as inadequate irrigation facilities (score 57.43) and low price for milk (score 64.07) respectively. Under irrigated situation major constraints observed were high cost of quality seed (score 61.03) and high cost of feed and fodder (score 58.00) respectively. Under poultry enterprise, the high cost of poultry feed (score 83.00) was major constraint observed.

Keyword: Crop; dairy; farming systems; rainfed; irrigated; constraints

INTRODUCTION

Growth in agriculture has a direct impact on poverty alleviation as well as availability of food and nutritional security of the country. Apart from this, the share of agricultural products in the total export earnings is substantially contributing to the perspective economic growth. The kind and extent of support that agriculture and allied sectors provide to agro-based food and non-food industrial growth since independent era has been the green revolution of sixties which salvaged the country from being a chronic importer of food grains to an exporter. Farming systems play an important role in addressing the problems relating to instability of income, food and nutritional insecurity, unemployment, vulnerability and poverty of farmers. Income through arable farming alone is insufficient for majority of the marginal farmers. The other activities such as dairying, poultry, sericulture, apiculture, fisheries etc assume

critical importance in supplementing their farm income. Livestock rearing along with crop production is the traditional mixture of activities of the farmers all over the country; only the nature and extent varies from region to region. It fits well with farm level infrastructure, small land base, abundant labour and ensures full utilization of by-products.

Rajasthan is the largest state of India constituting 10.4 per cent of total geographical area and 5.67 per cent of total population of India (Anon 2011). About 65 per cent population of the state is dependent on agriculture and allied activities for its livelihood. The total geographical area of the Rajasthan state is 3,42,239 km² out of which 116.88 lakh ha is rainfed and 66.61 lakh ha under irrigated (Anon 2013). Agriculture in Rajasthan is primarily rainfed in nature which is 13.27 per cent of the total available land. The agriculture in most part of the state is rainfed and is

prone to high production risk. In order to meet the farm and family requirement, the farmers in the state have evolved different combinations of crops, livestock, horticulture, poultry etc. Nagaur district of the state was selected purposefully for the study. The total geographical area of district is 1,764 thousand hectares out of which 19.3 per cent is irrigated and 80.7 per cent is rainfed. This district is characterized by semi-arid climatic conditions with frequent drought. The farmers of the district have adopted the types of farming systems viz crop-based, livestock-based, sheep and goat rearing and poultry-based farming systems. The present study was undertaken to identify the different farming systems prevailing in Nagaur district and the constraints being faced by farmers in different farming systems.

METHODOLOGY

The study was conducted in Nagaur district of Rajasthan. Nagaur district was selected purposively as it is one of the major mixed farming areas where both irrigated and rainfed farming systems with highest livestock population prevail. The district consists of thirteen Tehsils out of which two Tehsils namely Merta City and Riyan Badi were selected purposively for the study on the basis of higher concentration of livestock population with rainfed and irrigated farming systems. From each Tehsil two villages were randomly selected. The selected villages in Merta City were Shivarampura and Jajarawas whereas in Riyan Badi Tehsil were Thanwala and Dhanipura. Sixty farmers (thirty each from rainfed and irrigated farming situations) were randomly selected in proportion to their total number in each size group. Both primary and secondary data were collected for the study. Various statistical and mathematical tools were used for analysis of the data.

The secondary data were collected from various publications and government offices. Primary data on various aspects of farming were collected from the head of each household with the help of a set of pre-tested comprehensive questionnaire designed for the study. Various constraints hindering the production under different farming systems were rated by using Garrett ranking method. The respondents were asked to rank the factors that limited the farm enterprises. The orders of merit were transformed into units of scores by using the following formula:

$$\text{Per cent position} = 100 (R_{ij} - .50) / N_j$$

where R_{ij} - Rank given for the i^{th} factor by the j^{th} individual,
 N_j - Number of factors ranked by the j^{th} individual

The per cent position was converted into scores by referring to the method suggested by Garrett and Woodworth (1981). For each factor the scores of the respondents were added together and divided by the total number of respondents for whom scores were added. The mean scores for all the factors were arranged in descending order and the most influencing factors were identified through the ranks assigned.

RESULTS and DISCUSSION

Existing/prevailing farming systems

The selected households in each size group were categorized on the basis of crops practiced and allied enterprises followed by them in respective situations of rainfed and irrigated farming systems. A combination of crops, dairy, goat, sheep and poultry enterprises were observed and grouped into different farming systems (FSs) viz FS-I (crop + dairy), FS-II (crop + dairy + goat), FS-III (crop + dairy + goat + sheep) and FS-IV (crop + poultry) (Table 1).

The data pertaining to cropping patterns and allied enterprises in different situations were tabulated and examined.

FS-I, FS-II, FS-III and FS-IV farming systems were adopted by 73.33, 10.00, 13.33, and 3.34 per cent farmers of rainfed area and 70.00, 13.33, 13.33 and 3.34 per cent farmers of irrigated situation respectively. It was observed that in both the situations, FS-I (crop + dairy) was adopted by majority of the farmers whereas minimum farmers adopted FS-IV (crop + poultry). The crops grown in all the farming systems were almost same under both the situations except for some crops viz cumin or wheat in FS-II and FS-IV under the irrigated situation respectively. The enterprises followed in FS-I were crops and dairy and the components of FS-II were crops, dairy and goat rearing under both the situations and in case of FS-III, enterprises were crops, dairy, goat and sheep rearing. Regarding FS-IV the enterprises followed were crops and poultry.

Cropping pattern and allied enterprises under rainfed situation

Under rainfed situation, crops were grown in both rabi and kharif seasons and dairy, goat and sheep rearing and poultry were also taken up by the farm

Table 1. Different farming systems adopted by the sample farmers in Nagaur district

Farming system (FS)	Rainfed situation			Irrigated situation		
	Number of farmers	Crop	Allied enterprise	Number of farmers	Crop	Allied enterprise
FS-I (C + D)	22 (73.33)	Moong, bajra, cotton, wheat, cumin	Dairy	21 (70.00)	Moong, bajra, cotton, wheat, cumin	Dairy
FS-II (C + D + G)	3 (10.00)	Moong, bajra, cotton, wheat	Dairy + goat	4 (13.33)	Moong, bajra, cotton, wheat, cumin	Dairy + goat
FS-III (C + D + G + S)	4 (13.33)	Moong, bajra, cotton, wheat	Dairy + goat + sheep	4 (13.33)	Moong, bajra, cotton, wheat	Dairy + goat + sheep
FS-IV (C + P)	1 (3.34)	Moong, bajra, cotton, cumin	Poultry	1 (3.34)	Moong, bajra, cotton, wheat, cumin	Poultry
Total	30 (100)			30 (100)		

C= Crop, D= Dairy, G+ Goat, P= Poultry

Table 2. Cropping pattern and allied enterprises in existing farming systems under rainfed situation

Farming system (FS)	Gross cropped area (ha)	Cultivated area (ha)	Cropping intensity (%)	Crops	Area (ha)	Dairy cattle (number)	Goat (number)	Sheep (number)	Poultry (number)
FS-I (C + D)	1.20	0.97	123.71	Moong Bajra Cotton Wheat Cumin	0.75 0.17 0.07 0.09 0.13	1.12	-	-	-
FS-II (C + D + G)	1.51	1.18	127.96	Moong Bajra Cotton Wheat	0.51 0.46 0.22 0.32	1.33	4.33	-	-
FS-III (C + D + G + S)	0.61	0.55	110.91	Moong Bajra Cotton Wheat	0.36 0.12 0.07 0.06	0.37	2	13.31	-
FS-IV (C + P)	9.56	7.94	120.40	Moong Bajra Cotton Cumin	6.48 0.65 0.81 1.62	-	-	-	1,200

C= Crop, D= Dairy, G+ Goat, P= Poultry

households along with crops (Table 2). Four farming systems existed viz FS-I (crop + dairy), FS-II (crop + dairy + goat), FS-III (crop + dairy + goat + sheep) and FS-IV (crop + poultry). Maximum number of farm households (73.33%) adopted FS-I (crop + dairy) (Table 1). Cropping intensity ranged from 110.91 to 127.96 per cent. The highest cropping intensity was observed under FS-II (127.96%). The total gross cropped area under all farming systems viz FS-I, FS-II, FS-III and FS-IV was 12.89 ha in which FS-IV

contributed the maximum gross cropped area of 9.56 ha followed by FS-II (1.51 ha). Minimum area was found under FS-III (0.61 ha). The non-crop enterprises like dairy existed under three farming systems, viz under FS-I, FS-II and FS-III and under FS-IV only poultry was taken up. Under FS-II the average number of dairy cattle maintained on farms was highest (1.33) along with 4.33 goats. On an average 2 goats and 13.31 sheep per household were found under FS-III. Similar findings were reported by Naik et al (1991), Ramrao

et al (2005), Meena et al (2009), Toor et al (2009) and Das and Barman (2010).

Cropping pattern and allied enterprises under irrigated situation

Under irrigated situation four farming systems existed (FS-I, FS-II, FS-III and FS-IV). Under this situation, crops were grown in both rabi and kharif seasons and dairy, goat and sheep rearing and poultry were also taken up by the farm households along with crops (Table 3). Out of total farmers, maximum (70.00%) adopted FS-I (Table 1). Cropping intensity ranged from 129.61 to 157.57 per cent. The highest cropping intensity was observed under FS-III (157.57%) followed by FS-IV (141.67%) and FS-I (133.33%) whereas lowest was found under FS-II (129.61%). The total gross cropped area under all farming systems was 18.28 ha in which FS-IV contributed the maximum (13.77 ha) followed by FS-II (2.66 ha). The non-crop enterprises like dairy existed under three farming systems viz FS-I (only dairy cattle), FS-II (dairy and goats), FS-III (dairy cattle, goats and sheep) and FS-IV (only poultry). Under FS-II average number of dairy was 2.25 along with 3.12 goats followed by FS-III where average number of dairy was 0.62 along with 1.87 goats and 11.25 sheep. On an average 1,600 birds per household were found under FS-IV.

Constraints faced by farmers under the different enterprises

Crop enterprises

Constraints faced by households varied under rainfed and irrigated situations (Table 4). Under rainfed situation inadequate irrigation facilities was the major constraint with Garrett score 57.43 followed by high cost of quality seeds with Garrett score of 35.30. Lack of credit availability with Garrett score of 0.40 was the least important constraint of the households.

Under irrigated situation major constraint was high cost of quality seeds (score 61.03) followed by lack of availability of agricultural labour (score 59.13), high cost of labour (score 53.67), low price of farm produce at the time of harvest (score 51.77) and inadequate irrigation facilities (score 49.10). Singh and Sing (2005) and Choudhary et al (2007) also reported similar findings.

Constraints faced by farmers under livestock enterprises

Constraints faced by households under livestock enterprises are presented in Table 5. The data reveal that low price for milk (score 64.07), high cost of feed and fodder (score 61.57), high cost of concentrates

Table 3. Cropping pattern and allied enterprises adopted in different farming systems under irrigated situation

Farming system (FS)	Gross cropped area (ha)	Cultivated area (ha)	Cropping intensity (%)	Crops	Area (ha)	Dairy cattle (number)	Goat (number)	Sheep (number)	Poultry (number)
FS-I (C + D)	1.32	0.99	133.33	Moong	0.54	1.21	-	-	-
				Bajra	0.11				
				Cotton	0.35				
				Wheat	0.11				
				Cumin	0.20				
FS-II (C + D + G)	2.67	2.06	129.61	Moong	1.44	2.25	3.12	-	-
				Bajra	0.41				
				Cotton	0.20				
				Wheat	0.04				
				Cumin	0.57				
FS-III (C + D + G + S)	0.52	0.33	157.57	Moong	0.22	0.62	1.87	11.25	-
				Bajra	0.08				
				Cotton	0.04				
				Wheat	0.18				
FS-IV (C + P)	13.77	9.72	141.67	Moong	3.24	-	-	-	1,600
				Bajra	1.62				
				Cotton	4.86				
				Wheat	3.24				
				Cumin	0.81				

C= Crop, D= Dairy, G+ Goat, P= Poultry

Table 4. Constraints faced by farmers in crop production under rainfed and irrigated situation

Constraint	Rainfed situation		Irrigated situation	
	Garrett score	Rank	Garrett score	Rank
High cost of quality seeds	35.30	2	61.03	1
Inadequate irrigation facilities	57.43	1	49.10	5
Lack of technical guidance	5.20	10	43.40	12
Low price of farm produce at the time of harvest	17.37	5	51.77	4
Lack of availability of agricultural labour in peak season	23.37	4	59.13	2
Lack of marketing facilities	2.93	11	46.83	9
Lack of timely availability of good quality seed	25.57	3	48.67	6
High cost of labour	10.57	8	53.67	3
Lack of credit availability	0.40	12	45.60	10
Lack of knowledge about improved production practices	12.17	7	47.03	8
Lack of storage facilities	9.10	9	45.47	11
High incidence of diseases and pests	17.67	6	47.30	7

Table 5. Constraints faced by farmers under livestock enterprises

Constraint	Rainfed situation		Irrigated situation	
	Garrett score	Rank	Garrett score	Rank
High cost of feed and fodder	61.57	2	58.00	1
Non-availability of dry fodder	50.60	6	53.93	4
High mortality rate	46.00	11	50.40	10
High cost of concentrates	59.97	3	57.13	2
Inaccessibility to organized market	47.43	10	50.87	9
Lack of AI and veterinary facilities	53.10	5	52.27	6
Lack of productive animals	50.53	7	52.20	7
Low price for milk	64.07	1	54.90	3
Lack of cold storage facilities	49.87	9	49.33	11
Improper housing facilities	49.93	8	51.60	8
Non-availability of green fodder round the year	54.43	4	52.50	5

(score 59.97) and non-availability of green fodder round the year (score 54.43) were the major constraints under rainfed situation. Under irrigated situation, cost of feed and fodder (score 58.00), high cost of concentrates (score 57.13), low price for milk (score 54.90) and non-availability of dry fodder (score 53.93) were the important constraints faced by the households.

Constraints faced by farmers under poultry enterprise

Constraints faced by households under poultry enterprise in Nagaur districts are presented in Table 6. Data reveal that was high cost of poultry feed (score 83.00) was the most important constraint followed by lack of credit facilities (score 73.00) and lack of training on poultry health management (score 66.00) under both the situations in the study area.

CONCLUSION

Under both rainfed and irrigated situations, FS-I (crop + dairy) was adopted by maximum number of farmers and minimum number of farmers adopted FS-IV (crop + poultry). The major constraint under rainfed situation in crop production was the inadequate irrigation (score 57.43). The major constraint under irrigated situation in crop production was high cost of quality seeds (score 61.03).

The major constraint under rainfed situation in livestock enterprises was low price for milk (score 64.07). The major constraint under irrigated situation in livestock enterprise was high cost of feed and fodder (score 58.00). The major constraint under both the situations in poultry enterprise was the high cost of poultry feed score (83.00).

Table 6. Constraints faced by farmers under poultry enterprise

Constraint	Garrett score	Rank
High cost of poultry feed	83.00	1
Lack of knowledge on preparation of poultry feed	56.00	5
Lack of credit facilities	73.00	2
Lack of technical assistance	60.00	4
Lack of training on poultry health management	66.00	3

The study showed that under rainfed area, FS-III (crop + dairy + goat + sheep) and under irrigated situation, FS-IV (crop + poultry) gave better results. Thus farmers should be motivated to adopt non-crop activities like dairy, goat rearing, sheep rearing and poultry for enhancing their income and employment on farms. Efforts should also be made at all levels to create awareness among the people for adoption of cultivation of commercial/cash crops like cumin, cotton etc. Under irrigated situation for efficient use of available irrigation facilities, micro-irrigation systems should be encouraged and for rainfed situation, awareness should be created among farmers for construction of more and more farm ponds for conservation of rain water. Government along with private agencies should make efforts for breed improvement programme and develop marketing/ collection centers for milk and milk products, medical facilities and buffer stock for feed and fodder.

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