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Analysis of Constraints Faced by Farmers during Crop Production in Banswara District of Rajasthan

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ABSTRACT

A study was conducted to analysis the constraints faced by farmers during crop production under canal irrigation in Banswara district of Rajasthan. A total of 120 farmers were selected from 6 randomly selected villages of 3 tehsils namely Garhi, Gathol and Banswara. The primary data were collected with the help of pre structured schedule during the year 2020-2021. Garrett's Ranking technique and Rank Based Quotient (RBQ) method used for analyzing the problems faced by farmers in study area. Results of study revealed that among technical the most constraint was lack of adequate water for irrigation at the critical period. Lack of marketing facilities at local place was found major constraint related to market. Fragmented land holding was observed prime constraint at farm level. Other constraints were related to labour, financial and environment.

Key words: Garrett's ranking, Constraints, Rank based quotient, Crop production

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 (Government of India, 2011). Rajasthan State is located within latitude 23°30' N-30°12' N and longitude 69°30' E-78°17' E in the western part of the Indian subcontinent. Southern Rajasthan is an important physiographic unit of state, lying in the lap of Aravalli Mountain. Southern Rajasthan comprising the districts of Bhilwara, Udaipur, Banswara, Dungarpur and Chittorgarh is popularly known as "Mewar". Water is an important determinant factor for the production of crops in the agriculture sector of the state [1]. Rajasthan agrarian mainly depends upon the monsoon. The behaviour of monsoon in Rajasthan is usually erratic and uncertain. At present, less than one fourth of the state's area is under irrigation. The main sources of irrigation in Rajasthan are canals, tanks, tube-wells and wells [2].

The canal irrigation is the main source of irrigation in the district is mainly canal in all tehsils of the district except Kushalgarh tehsil where only groundwater is used for irrigation. Groundwater is utilized through dug wells, and tube-wells. Canal irrigation is mostly by Mahi dam project. Tanks also form an important source of irrigation in the district. Total irrigated area was 109.91 thousand hectares in Banswara. Source wise highest irrigated area was 61.02 thousand hectares (55.47 per cent) of total irrigated area by canals. 20.60 thousand

hectares (18.99 percent) irrigated area was through wells (open and bore wells). 11 thousand hectares (10.00 per cent) area was irrigated by lift irrigation. 6.82 thousand hectares (6.20 percent) irrigated area was by tank irrigation source [3]. 10.47 thousand hectares (9.61 per cent) irrigated area was through other irrigation sources [4].

MATERIALS AND METHODS

The present study was based on primary data. Banswara district has been purposively selected for the study on the basis of highest irrigated area under main source of irrigation as canal irrigation. A total of 120 farmers were selected from 6 randomly selected villages of 3 tehsils namely Garhi, Gathol and Banswara. The respondents were interviewed personally with the help of a well-structured and pre tested interview schedule in order to get relevant information. The detailed information required for the study was collected for the year 2020-21. The constraints faced by the farmers during crop production were divided into different categories viz. technical, market related, farm level, labour related, financial and environment related constraints. Constraints analysis was done by two methods such as Garrett's Ranking technique and Rank Based Quotient for analyzing the problems faced by farmers in study area.

(i) *Garrett's Ranking technique:* Garrett's Ranking technique was used to analyze the constraints faced by the farmers under tube-well and canal irrigation sources of water. In this method the respondents were asked to assign the rank for relevant indicators listed and the outcomes of such ranking was converted into score value with the help of the following formula:

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$$\text{Per cent position} = 100 \times \frac{(R_{ij} - 0.5)}{N_j}$$

Where;

R_{ij} = Rank given for i^{th} variable by the i^{th} respondents

N_j = Number of variables ranked by the j^{th} respondents

With the help of Garrett's table, the per cent position was estimated and converted into scores, then for each constraints the per cent position values were evaluated and mean values of score was calculated. The factor having highest mean value was considered to be the most important factor and ranked accordingly.

(ii) *Rank Based Quotient (RBQ)*: For the calculation of RBQ, each respondent was asked to give ranking from the prepared list of constraints according to the perceived severity. Each respondent was assigned different ranking for different constraints based on their own perception. The problem having highest RBQ value considered as major constraints.

Rank Based Quotient (RBQ) was calculated by using following formula:

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

Where;

f_i = frequency of respondents reporting a particular constraint under i^{th} rank;

N = total number of respondents;

n = number of constraints identified;

i = rank of the attributes

RESULTS AND DISCUSSION

The constraints faced by the farmers during crop production were divided into different categories viz. technical, market related, farm level, labour related, financial and environment related constraints. The results are presented in table 1 to 6 as follows:

Technical level constraints: The results of score and ranking of Garrett and RBQ in crop production for technical constraints faced by farmers are depicted in (Table 1). Results revealed that farmers were faced prime constraints of lack of adequate water for irrigation at the critical period (Garrett score 76.07 and RBQ score 94.79) followed by Poor maintenance of canal/ distribution system (Garrett score 66.72 and RBQ score 84.89) and siltation problem in channels (Garrett score 59.22 and RBQ score 73.02) and other constraints in Banswara district. The least technical constraints faced by the farmers was high cost of irrigation water lifting (Garrett score 23.30 and RBQ score 16.77) in Banswara district due to no charges taken of canal water supply by Rajasthan government. Similar results reported by Rohit *et al.* [5] in peri urban vegetable cultivation in Uttar Pradesh.

Table 1 Technical level constraints faced by farmers under canal irrigation in Banswara district

Constraints	Garrett		RBQ	
	Score	Rank	Score	Rank
Lack of adequate water for irrigation at the critical period	76.07	I	94.79	I
High cost of irrigation water lifting	23.30	VIII	16.77	VIII
Short of electricity power supply duration	42.86	VI	41.97	VI
Odd timings of electricity supply	33.85	VII	28.75	VII
Less availability or local non availability of conveyance pipe. Nozzles, etc.	46.63	V	49.79	V
Poor maintenance of canal/ distribution system	66.72	II	84.89	II
No repair or untimely repair of distribution system	53.94	IV	63.54	IV
Siltation problem in channels	59.22	III	73.02	III

Market level constraints: Results showed in (Table 2) that farmers were faced prime constraints of lack of marketing facilities at local place which was given Garrett score 75.78 and RBQ score 94.68 in Banswara district. Higher cost of fertilizer and manure (Garrett score 67.18 and RBQ score 85.31) was found second most constraints in the study area. Non-

availability of fertilizer in required period and quantity was given third rank and so on. Bishnoi *et al.* [6] was observed similar results in the study. The lowest market level constraints faced by the farmers was delay in receiving output payment in the studied area. Prakash *et al.* [7] also reported similar findings in their study.

Table 2 Market level constraints faced by farmers under canal irrigation in Banswara district

Constraints	Garrett		RBQ	
	Score	Rank	Score	Rank
Non - availability of quality seed	31.82	VII	25.52	VII
Non-availability of fertilizer in required period and quantity	61.12	III	75.83	III
High cost of fertilizer and manures	67.18	II	85.31	II
High cost of plant protection chemicals	44.93	V	46.97	V
Lack of market access for input and output	41.45	VI	39.68	VI
Transportation problem (farm to mandi)	51.96	IV	60.20	IV
Delay in receiving output payment	24.15	VIII	17.50	VIII
Lack of marketing facilities at local place	75.78	I	94.68	I

Farm level constraints: The major constraints at the level of farm level as faced by farmers are depicted in (Table 3) with their scores as well ranks. The analysis revealed that fragmented land holding was the first and major constraints observed

highest Garrett score 64.88 and RBQ score 92.77 in Banswara district. Low land (water logged) and non- suitability of land for cropping were observed to be second and third constraints, respectively [8].

Table 3 Farm level constraints faced by farmers under canal irrigation in Banswara district

Constraints	Garrett Score	Garrett Rank	RBQ Score	RBQ Rank
Fragmented land holding	64.88	I	92.77	I
Non- suitability of land for cropping	35.27	III	40.83	III
Low land (water logged)	51.58	II	69.44	II

Labour related constraints: The data in (Table 4) revealed that non-availability of labour during harvesting period was ranked first by the respondents with Garrett score and RBQ score i.e., 64.72 and 92.50 respectively. Other important constraints related to labour were high cost of labour

(Garrett score 49.52 and RBQ score 65.83) and lack of skilled labour availability in harvesting (Garrett score 36.54 and RBQ score 43.05) which were ranked at second and third position respectively in study area. Raj *et al.* [9] also reported similar constraints in paddy cultivation in Kerala.

Table 4 Labour level constraints faced by farmers under canal irrigation in Banswara district

Constraints	Garrett		RBQ	
	Score	Rank	Score	Rank
Non availability of labour during harvesting period	64.72	I	92.50	I
High cost of labour	49.52	II	65.83	II
Lack of skilled labour availability in harvesting season	36.54	III	43.05	III

Financial level constraints: The constraints related to financial aspect of farmers are depicted in (Table 5). The table reveals that poor economic condition of farmers was the biggest constraints faced by the farmers with the score of Garrett (69.00) and RBQ (89.50) and it was ranked first. Unawareness of credit facilities provided by government (Garrett score 62.00 and RBQ score 79.66) was the next important constraints faced

by the farmers in Banswara district. Lack of funds for digging wells/ tube- wells/pond/tank (Garrett score 54.37) was third rank according to Garrett method while lack of insurance coverage (RBQ score 55.00) was given third rank according RBQ method. Other least constraint related to financial faced by the farmer was inadequate subsidy on electricity and fertilizer [10].

Table 5 Financial level constraints faced by farmers under canal irrigation in Banswara district

Constraints	Garrett		RBQ	
	Score	Rank	Score	Rank
Unawareness of credit facilities provided by government	62.00	II	79.66	II
Poor economic condition of farmers	69.00	I	89.50	I
Lack of funds for digging wells/ tube- wells/pond/tank	54.37	III	28.66	V
Inadequate subsidy on electricity and fertilizer	41.67	IV	41.16	IV
Lack of insurance coverage	29.42	V	55.00	III

Environment level constraints: Constraints faced by farmers at environment level in Banswara district revealed from Table 6 that fluctuation in temperature and humidity during crop growth period (Garrett score 62.98 and RBQ score 89.44)

was major constraints. Other important constraints at environment level were high incidence of disease and pest and high rainfall during standing crop which were ranked at second and third position respectively [11].

Table 6 Environment level constraints faced by farmers under canal irrigation in Banswara district

Constraints	Garrett		RBQ	
	Score	Rank	Score	Rank
High incidence of disease and pest	60.76	II	85.55	II
High rainfall during standing crop	39.23	III	47.77	III
Fluctuation in temperature and humidity during crop growth period	62.98	I	89.44	I

CONCLUSION

Thus, it can be concluded from the results of study that major constraints faced by the farmers among the technical constraints the most important constraints were non availability of water supply for irrigation at the right time and high cost of irrigation. For proper irrigation of their crops, inadequate electricity supply was the major hindrance and regular supply of electricity to overcome the problem of irrigation. The lack of marketing facilities at local place, high cost of fertilizer and manures, non-availability of fertilizer in required period and

quantity were the biggest constraint faced by the farmers. Among the labour related problem unavailability or non-availability of labour during harvesting period and high cost of labour, fragment land holding and non- suitability of land for cropping were most important constraints related to farm level problems. Fluctuation in temperature and humidity during crop growth period was major constraint related to environment. It is suggested that more government shops or centres should be opened at local place to ensure adequate and timely supply of these inputs at fair price. Other constraints were related to financial.

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