

KNOWLEDGE AND ADOPTION OF SPRINKLER IRRIGATION SYSTEM BY THE FARMERS OF BANASKANTHA DISTRICT OF NORTH GUJARAT

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ABSTRACT

The study was conducted in purposely selected two talukas of Banaskantha District of North Gujarat viz., Dantiwada and Deesa. From each taluka, six villages selected purposely and from each village 10 farmers were selected by using random sampling technique, there by constituting a total sample size of 120 respondents. Data were collected by using personal interview method. The collected data were tabulated, analyzed and interpreted with the help of appropriate statistical tools. However, majority of farmers were found having medium level of knowledge and adoption in sprinkler irrigation system.

INTRODUCTION

Land and water are important natural resources which play an important role in agricultural production. However, due to the scarce conditions of water for irrigation, many parts of the land were unutilized or underutilized. This is mainly due to the fact that the rainfall is irregular and uneven in many parts of country. Gujarat is no exception under this situation, shortage of water has become one of the main problems in Gujarat agriculture. Therefore, efficient use of available water has become extremely important which can be done through sprinkler irrigation.

Sprinkler irrigation is still in its infancy in India and there is a need to make it popular among the farmers. Even though there is a phenomenal growth in the area under sprinkler irrigation, a lot of work is still to be done to explain and convince the farmers, especially those in the dry land area about the high potentialities of this new system. The main purpose of this study was to get a clear-cut picture of the present situation of the knowledge and adoption of sprinkler irrigation system in North Gujarat especially in Banaskantha district where problems of scarcity as well as abundance of water were there.

Therefore, the present study "Knowledge and adoption of sprinkler irrigation system by the farmers of Banaskantha district of North Gujarat" was planned with the following specific objectives.

1. To study the personal, socio-economical, communicational, psychological and situational characteristics of the farmers.
2. To find out the extent of adoption of the farmers about sprinkler irrigation system.
3. To identify the constraints faced by the farmers in the adoption of sprinkler irrigation system.
4. To seek suggestions to overcome the constraints faced by the farmers in the adoption of sprinkler irrigation system.

RESEARCH METHODOLOGY

The present study was purposely undertaken in the two talukas viz., Dantiwada and Deesa talukas of Banaskantha district of Gujarat state. Six villages were purposely selected from each taluka on the basis of higher number of farmers having sprinkler irrigation system. Thus, total twelve villages were purposely selected. From each selected village, 10 farmers were selected randomly by making a sample of 120 respondents.

The present study was confined to ex-post-facto research design. The independent variables were measured by using suitable scale and procedure adopted by various researchers in past with due modification. The dependent variable taken in this study was extent of adoption of sprinkler irrigation system which was measured by developed struc-

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tured schedule on the basis of the adoption quotient developed by Sengupta (1967).

An interview schedule was developed according to objectives of study and the data were collected by arranging personal interview with 120 respondents. The collected data were classified, tabulated and analysed in order to make the findings meaningful. A simple ranking technique applied to measure the problems and suggestions to overcome problems of adoption of sprinkler irrigation system. The statistical tools used to analyse the data were percentage, mean score and standard deviation.

RESULTS AND DISCUSSION

Personal, Socio-Economical, Communicational, Psychological and Situational Characteristics of the Farmer

The personal, socio-economical, communicational, psychological and situational characteristics of the famers were studied and the data have been given in Table1.

Table 1: Distribution of respondents by the personal, socio-economical, communicational, psychological and situational characteristics

S. No.	Category	Num ber	Per cent
1.	Age		
	Young (up to 35 years)	16	13.33
	Middle (between 36 to 50 years)	84	70.00
2.	Education		
	Old (above 50 years)	20	16.60
	Illiterate	05	04.17
	Primary (up to 7 th standard)	28	23.33
	Secondary (8 th to 10 th standard)	31	25.83
3.	Land holding		
	Higher (11 th to 12 th standard)	41	34.17
	College and above	15	12.50
	Small (up to 2 ha)	23	19.17
4.	Social participation		
	Medium (between 2.1 to 4.0 ha)	63	52.50
	Large (More than 4.0 ha)	34	28.33
5.	Annual income		
	No membership	10	08.33
	Membership in one organization	30	25.00
	Membership in more than one organization	72	60.00
6.	Land holding		
	Holding position in organization	08	06.67
	Low (up to 76,000/-)	17	14.17
	Medium (b/w76, 001/- to 2, 44,000/-)	82	68.33
7.	Sources of information		
	High (above 2, 44,000/-)	21	17.50
	[Mean = 159933.00, SD = 84017.00]		
8.	Knowledge level		
	Low (up to 51 score)	17	14.17
	Medium (between 52 to 72 score)	90	75.00
9.	Economic motivation		
	High (above 72 score)	13	10.83
	[Mean = 62.25, SD = 10.47]		
10.	Source of irrigation		
	Low (up to 19 score)	18	15.00
	Medium (between 20 to 26 score)	82	68.33
11.	Cropping pattern		
	High (above 26 score)	20	16.67
	[Mean = 22.79], SD = 3.69]		
12.	Cropping intensity		
	Tube -well	37	30.83
	Open-well	35	29.17
	Canal	10	08.33
	Tube-well and Open-well	19	15.83
	Tube-well and Canal	11	09.17
13.	Cropping intensity		
	Tube-well and Open-well and Canal	08	06.67
	[Mean = 233.45, SD = 26.50]		
14.	Cropping pattern		
	Groundnut–Wheat–Cowpea	27	22.50
	Clusterbean–Potato–Pearl millet	70	58.33
15.	Cropping intensity		
	Cotton–Mustard–Green gram	23	19.17
	Low (Up to 206 per cent)	14	11.67
16.	Cropping intensity		
	Medium (between 207 to 260 per cent)	85	70.83
	High (above 260 per cent)	21	17.50
[Mean = 233.45, SD = 26.50]			

It was evident that majority (70.00 per cent) of the farmers were from the middle age group, followed by 16.67 and 13.33 per cent in the old and young age group, respectively. More than one-third (34.17 per cent) of farmers were having higher secondary level of education followed by 25.83 per cent farmers in secondary level of education. Only 12.50 per cent farmers had education up to college level whereas, 4.17 per cent farmer were illiterate.

More than half (52.50 per cent) of farmers had medium size of land holding, followed by 28.33 and 19.17 per cent of farmers had large and small land holding, respectively. The majority (60.00 per cent) of the farmers were having membership in more than one organization followed by 25.00 per cent of them had membership in one organization and 8.33 per cent had not taken part in any social organization, whereas, only 6.67 per cent were possessing holding position in one or more organization.

More than two-third (68.33 per cent) of farmers had medium annual income, followed by 17.50 per cent and 14.17 per cent of farmers had high and low annual income, respectively. The majority of the farmers (75.00 per cent) utilized medium sources of information followed by 14.17 per cent and 10.83 per cent who utilized low and high sources of information, respectively.

The majority (60.83 per cent) of the farmers possessed medium level of knowledge, followed by 20.83 per cent and 18.34 per cent of farmers possessed high and low level of knowledge about sprinkler irrigation system, respectively. The similar results were observed by Yadav (1993). The majority (68.33 per cent) of the farmers had medium level of economic motivation, followed by 16.67 per cent and 15.00 per cent of farmers with low and high level of economic motivation, respectively.

The respondents 30.83 per cent were using tube-well as an irrigation sources, followed by 29.17 per cent farmers using only open-well for irrigation source, only 15.83 per cent respondents using tube-well and open-well both for irrigation sources, respectively.

More than half (58.33 per cent) of farmers had clusterbean–potato–pearl millet cropping pattern, followed by 22.50 per cent and 19.17 per cent of farmers had groundnut–wheat–cowpea and cotton–mustard–green gram annual cropping pattern, respectively. More than two-third (70.83 per cent) of the farmers had medium level of cropping intensity, followed by 17.50 per cent and 11.67 per cent of the farmers were having high and low level of cropping intensity, respectively.

Extent of adoption of the farmers about sprinkler irrigation system

Table :2 indicates that the majority (66.67

per cent) of farmers had medium level of adoption of sprinkler irrigation system. While, 18.33 and 15.00 per cent farmers had high and low level of adoption of sprinkler irrigation system, respectively. The similar results were observed by Patel *et al.* (1994) & Suthar (2010).

Table 2: Distribution of the respondent according to their extent of adoption of sprinkler irrigation system (n=120)

S.No.	Category	Number	Per cent
1.	Low (Up to 39 score)	18	15.00
2.	Medium (between 40 to 58 score)	80	66.67
3.	High (above 58 score)	22	18.33
		[Mean = 48.43	SD = 8.63]

Constrains faced by the farmers in the adoption of sprinkler irrigation system

Among the all fifteen problems in adoption and operation of sprinkler irrigation system, “heavy initial investment for the installation of sprinkler irrigation system” (82.50 per cent) was ranked first. Also, “difficulties in getting loans” (74.17 per cent), “rate of interest in loans is high” (67.50 per cent), “inadequate credit facilities for the farmers” (62.50 per cent) and “unavailability of technical guidance in time” (60.84 per cent) were ranked second, third, fourth and fifth, respectively.

The rank of sixth to twelve in deciding order were “less efficiency of the sprinkler due to high wind velocity” (56.67 per cent), “high maintenance cost of this system” (47.50 per cent), “unavailability of spare parts in the local market” (42.50 per cent), “presence of highly acidic or salty water” (35.84 per cent), “irregular supply of electricity in the area” (30.00 per cent), “high technical competence is required for operation of sprinkler irrigation system” (25.00 per cent) and “due to high temperature more water loss in sprinkler irrigation system” (22.50 per cent), respectively. Whereas, the problems like, “less subsidy as compared to investment” (20.83 per cent), “uneven distribution of water in tall growing crops” (13.33 per cent) and “non-availability of spare parts at proper time in the village market” (9.16 per cent) were ranked thirteen, fourteen and fifteen, respectively. The result was supported by Singh *et al.* (1998) and Kalsariya *et al.* (2003).

Suggestions To Overcome The Constrains Faced By The Farmers In The Adoption of Sprinkler Irrigation System

The important suggestions endorsed by the farmers were, “analyse the water before installing the sprinkler irrigation system” (82.00 per cent), “knowledge about acid treatment should be provided” (70.00 per cent), “company should make high quality sprinkler material” (64.00 per cent), “training should provided to farmers on how to use sprinkler irrigation system” (53.00 per cent) and step should be taken by government to visit company dealers forcefully” (40.00 per cent) which were assigned rank as first, second, third, fourth and fifth, respectively.

CONCLUSION

The majority of the farmers belonged to middle age group having secondary and above education, size of land holding medium having membership in more than one organization, having income in between Rs.76, 001 to Rs.2, 44,000 and used tube-well as an irrigation sources. Farmers had medium level of sources of information, economic motivation, cropping pattern and cropping intensity. Farmers possessed medium level of knowledge about sprinkler irrigation system. Majority of the farmers were found to have medium level of adoption of sprinkler irrigation system.

Regarding problems of sprinkler irrigation system majority of the farmers facing the problems like, “heavy initial investment for the installation of sprinkler irrigation system, difficulties in getting loans, rate of interest in loans in high and unavailability of technical guidance in time”.

The important suggestions were given by the respondents to solved these problems faced were, “analyse the water before installing the sprinkler irrigation system, knowledge about acid treatment should be provided, company should make high

quality sprinkler material, training should provided to farmers on how to use sprinkler irrigation system and step should be taken by government to visit company dealers forcefully”.

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