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FUTURE PROSPECTS OF DRIP IRRIGATION SYSTEM

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ABSTRACT

The present study was conducted in Chittorgarh and Udaipur districts of Rajasthan.Chittorgarh and Udaipur district is situated in the southern part of Rajasthan state. The majority of farmers had expressed medium future prospects toward drip irrigation system. It was noticed that farmers had highest degree of agreement with statement i.e. under the water scare conditions, DIS is the only solution and least level of agreement with statement i.e. the future of the DIS seems to be dark.

INTRODUCATION

Water is the most precious natural resource; it is essential for agricultural development and all organic life on the earth. Intensive agriculture and an ever-growing human population are fast depleting this already scarce resource. This is a challenging situation and the need of hour is to conserve 'water' and ensure its 'efficient use'. In the face of changing agriculture scenario across the world and a shift towards precision farming, drip irrigation appears to be the technology capable of providing more efficient utilization of water. "Drip irrigation is basically precise and slow application of water in the form of discrete continuous drops, sprayed through mechanical devices, called emitters into the root zone of the plant." Singh (1995) reported that by the drip system of irrigation, water reaches the roots drop by drop and hence, it is economic method of irrigation.

Drip irrigation system is relatively a new concept, which has developed over the last decade throughout the world. In 1964, Symcha Blass an Israeli engineer developed the first potential drip irrigation system (DIS). Today India ranks 7th in terms of coverage of area under drip irrigation with an irrigated area of 2, 87,500 hectares after USA, Spain, Australia, South Africa, Israel and Italy (Anonymous, 2004). In this method, water is supplied directly near the roots of plants, drop by drop, with the help of drippers. Drippers are linked with side pipe lets, which are linked with main pipeline connected with water supplying source.

Drip irrigation system is extremely profitable as it saves 40-70 per cent water as compared to surface irrigation method and reduces labour cost, protects the plants from diseases by minimizing humidity in atmosphere. Besides, soluble fertilizers can also be applied with irrigation water (Anonymous, 2006). Thus, drip irrigation has become a means of hi-tech agriculture/ Horticulture and precision farming. This system is especially suitable for saline and alkaline soil and the efficiency of water is enhanced by 90 -95 per cent under drip irrigation system. Bahuguna (1996) stated that by drip system of irrigation, 95 per cent of the irrigation water can be used efficiently and the production may be increased by 30-50 per cent.

The technology has the potential to doubling the area under irrigation through a judicious use of water efficiency as high as 80-90 per cent as compared to 30-50 per cent in case of surface irrigation. This technique is very commonly used in Israel. The agro-climatic conditions, soil and availability of irrigation water are almost similar in Israel and in the state of Rajasthan.

Rajasthan is the largest state in India with a total geographical area of 34.20 m. ha which accounts for 10.425 per cent of country. But it has only 1.18 per cent country's water resource. It is an extremely water scarce state. The estimated ultimate irrigation potential of the state is 4.663 m. ha from surface water and 2.93 million ha from ground water against which the potential created up to 31.39 was 2.73 m. ha from surface water and about 1.9 m. ha. from ground wa-

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ter. Due to arid and semi-arid climatic condition leading to a negative moisture index, poor soil quality and traditional agriculture practices, the food security, nutritional security and sustainability of horticulture production system are still of a distant dream in the state. Wells and tube wells are the major sources of water in the state. The irrigation scenario of Rajasthan is characterized by erratic or scanty rainfall, dwindling ground water resources increasing alternative demand of municipal and industrial sector. As a result, less water is available for agriculture. Therefore, various irrigation technologies have been introduced by the Government from time to time to boost up agricultural development. Lately much emphasis is being laid on drip irrigation. Keeping this fact in view, the present investigation was undertaken with an objective to study the future prospects of drip irrigation system in the Rajasthan.

RESEARCH METHODOLOGY

The present study was under taken in Chittorgarh and Udaipur district of Rajasthan. District and panchayat samities were selected purposely due to having highest area under drip irrigation system in southern Rajasthan. For selection of respondents, a comprehensive list of drip irrigation system owners in each identified panchayat samiti was prepared with the help of the personnel of state agriculture department. Form the list, 60 farmers from each district were selected through proportionate random sampling technique. Thus, a sample of 120 respondents was selected by simple random sampling technique from the study purpose. Data were collected interview schedule by the face to face method of interview technique. Thereafter, collected data were analyzed, tabulated and interpreted in the light of above objective.

RESULTS AND DISCUSSION

Generally, the farmers of Udaipur district follow flood irrigation with same improved methods of fruit production. Drip irrigation is in its infant stage in the district. Limited farmers are following this method.

This is high time to determine the future prospects of drip irrigation system. The result of this aspect will be helpful in planning the suitable programmes on adoption of drip irrigation system.

Table 1: Distribution of respondents according to expressed future prospects of drip irrigation system n= 120

S. No.	Level of future prospects	Districts				Total	
		Chittorgarh		Udaipur			
		f	%	f	%	f	%
1.	Low (<60.20)	8	13.33	12	20.00	20	16.67
2.	Moderate (60.2-70.10)	42	70.00	41	68.33	83	69.17
3.	High (>70.10)	10	16.67	7	11.67	17	14.16
	TOTAL	**60**	**100**	**60**	**100**	**120**	**100**

f = Frequency, % = Per cent, Mean = 65.15 & S. D. = 4.95

Data presented in Table 1 reveal that the respondents 83 (69.17 per cent) expressed medium future prospects toward, drip irrigation system followed by 20(16.67 per cent) of them who had expressed low prospects. However, only 17(14.16 per cent) of farmers expressed high prospects towards drip irrigation system.

Critical look at Table 1 brings to focus that 42 (70.00 per cent) Chittorgarh's and 41 (68.33 per cent) Udaipur's farmers had expressed medium prospects toward drip irrigation system. Besides, 8 (13.33 per cent) Chittorgarh's and 12 (20.00 per cent) Udaipur's farmers possessed low prospects toward drip irrigation system. However, only few, i.e.10 (16.67 per cent) Chittorgarh and 7 (11.67 per cent) Udaipur farmers showed high prospects toward drip irrigation system.

Attitude of respondents toward future of drip irrigation system

The detailed analysis of future prospect of drip system is given in Table 2. Table clearly shows that respondents were strongly agreed with statements viz, "Under the water scare conditions DIS is only the solution", "this system is useful therefore this must be continued in future" with agreement level of 94.50 and 94.33 respectively. These were followed by "in future, the DIS will be so devised that will irrigate all sorts of crops" Sprinkler irrigation is the

alternative of DIS", "DIS will save electricity, water and fertilizer consumption" and "in future, the weed problem will be also solved by DIS" alongwith respective agreement level 90.33,89.33,88.67 and 87.67. Table further shows that with highest level of agreement better prospect of DIS was observed the statements "in future, DIS is more efficient than flood irrigation" and "irrigation through DIS should be made compulsory to all the farmers". Further, the respondents were also strongly agreed that "DIS will be useful in only horticultural crops not in agronomical crops", "the crop production through DIS will be increased by 400 per cent", "DIS can be used even when the subsidy is not provided by the Govt" and "DIS is useful for even small, marginal and large farmers".

Table 2: Response to statements on future prospects of DIS **n= 120**

S. No.	Statement	Number of respondents					% level of agreement
		SA	A	UD	DA	SDA	
1.	This system is useful, therefore this must be continued in future	86	34	0	0	0	94.33
2.	DIS can be used even the subsidy is not provided by the Govt.	38	55	27	0	0	81.83
3.	DIS will be useful in only horticultural crops not in agronomical crops	43	67	10	0	0	85.50
4.	DIS is useful in all types of soils with all topographies	23	54	16	15	12	70.16
5.	DIS is useful for even small, marginal and large farmers	43	54	12	6	5	80.66
6.	Irrigation through DIS should be made compulsory to all the farmers	39	81	0	0	0	86.50
7.	Proper training and guidance about DIS being given by the Govt.	20	48	24	15	13	67.83
8.	The future of the DIS seems to be dark	0	0	9	93	18	38.50
9.	Small and marginal farmers should not venture for DIS	19	41	12	37	11	63.33
10.	In future, the DIS will be so devised that will irrigate all sorts of crops	62	58	0	0	0	90.33
11.	The DIS in future will be operated through remote control	33	61	11	15	0	78.67
12.	The crop production through DIS will be increased by 400 per cent	34	74	7	5	0	82.83
13.	In future, DIS will be more efficient than flood irrigation	42	78	0	0	0	87.00
14.	Sprinkler irrigation is the alternative of DIS	58	60	12	0	0	89.33
15.	DIS will save electricity, water and fertilizer consumption	25	68	0	0	0	88.67
16.	Under the water scare conditions, DIS is the only solution	87	33	0	0	0	94.50
17.	In future, the weed problem will also be solved by DIS	46	74	0	0	0	87.67

SA = Strongly Agree, A = Agree, UD = Undecided, D = Disagree, SD = Strongly Disagree

Further analysis of table clearly shows that 78.67, 70.16 and 67.83 per cent level of agreement was found about the statements "the DIS in future will be operated through remote control", "DIS is useful in all types of soils with all topographies" and "Proper training and guidance about DIS being given by the Govt". The statements, "small and marginal farmers should not venture for DIS" and "the future of the DIS seems to be dark" were less agreed respondents with 63.33 and 38.50 per cent level of agreement, respectively.

Table 3: Comparison of future prospects between two categories: n= 120

S. No.	Category of respondents	Mean	S.D.	'Z' Value
1.	Chittorgarh	65.31	5.21	0.35NS
2.	Udaipur	64.99	4.69	

NS = Non-significant.

To find out the significance of difference in future prospects between Chittorgarh and Udaipur farmers towards drip irrigation system, Z test was applied. The calculated Z value came to be 0.35, which is non-significant. It led to acceptance of null hypothesis (H_0) and rejection of alternative hypothesis (H_1). Thus, non-significant difference was found in future prospects between Chittorgarh and Udaipur farmers toward drip irrigation system.

CONCLUSION

Based on finding, that 69.17 percent of the respondents medium future prospects toward, drip irrigation system, it is concluded that the future of drip irrigation in the study is not so high. In conclusion, it can be stated that there seems bright prospect drip irrigation system in the study area From the above discussion, it could be concluded that there has been equal opportunities and best possibilities of drip irrigation system in both of the districts. It means that the both the categories of respondents had expressed more or less similar future prospects towards drip irrigation system in the study area.

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