



# Constraints Encountered by the Farmers in Adoption of Drip Irrigation System in District Jaipur

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## ABSTRACT

Drip irrigation is basically precise and slow application of water in the form of discrete continuous drops, sprayed through mechanical devices in to the root zone of the plants. Drip irrigation system is profitable as it saves 60-70 per cent water as compared to surface irrigation and other methods, protects the plants from diseases by minimizing humidity in atmosphere. The study was conducted in eight randomly selected gram panchayats of panchayat samiti Jhotwara of district Jaipur. Two villages were selected from each selected gram panchayat having maximum number of drip irrigation sets. Thus in all, 16 villages were selected purposively. Ninety six farmers were selected on the basis of proportional allocation. The study showed that the majority (51.04 %) of farmers were found in to the category of medium constraints level where as 22.92 per cent and 26.04 per cent farmers were found into the categories of low and high constraints levels, respectively, regarding constraints faced by farmers in adoption of drip irrigation system. amongst all the constraints financial constraints (73.30 MPS) were the most intensively perceived followed by general constraints (72.56 MPS), technical constraints (70.74 MPS), educational constraints (69.54 MPS), miscellaneous constraints (69.02 MPS), infrastructural constraints (68.84 MPS) and climatic and geographical constraints (67.15 MPS). Under the financial constraints, high initial cost of installing drip set was observed as the most severe constraint with 86.45 MPS. Difficulty in maintenance of DIS, regularly was most perceived general constraint by the farmers as it was perceived by 85.76 per cent farmers. Problem of blocking the drippers due to salt or other impurities in the water was most perceived technical constraints by the farmers as it was perceived by 85.76 per cent respondents. Inadequate awareness about the advantage of drip irrigation system was most perceived educational constraints.

## Key Words:

## INTRODUCTION

Drip irrigation system controls the time of application, amount of water and place of application of water. Drip irrigation is far more superior to other traditional methods like surface irrigation because it provides precisely the required amount of water, checks wastage. Secondly, it provides the condition that is created in surface irrigation, due to which there is a gap of 24 hr before plants can actually utilize the irrigation water. This system also permits the use of fertilizers, pesticides and other water-soluble chemicals along with water. It has been

found that fertigation is the most economic method of fertilizer application specially when applied through drip system. It leads to 40-50 per cent savings on nutrients application. Disease spread is also less in those places where drip system is being practiced with application of this technology. The Rajasthan state ranked 6th in terms of coverage of area under drip irrigation system (31203.49 ha.).

## MATERIALS AND METHODS

The study was conducted in Jaipur district of Rajasthan. Jaipur district comprises thirteen

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panchayat samities, out of which Jhotwara panchayat samiti was selected randomly and 8 gram panchayats were selected randomly. Two villages were selected from each selected gram panchayat having maximum number of drip irrigation sets. Thus, a total of 16 villages were selected purposively. Ninety six farmers were selected on the basis of proportional allocation. The responses regarding different constraints like general, technical, infrastructural, financial, educational, climatic and geographical and miscellaneous were recorded on three point continuum viz., most severe, severe and least severe which were assigned scores of 3, 2, and 1, respectively. Total score obtained by farmers as well as for each statement was calculated. The farmers were divided into three categories viz., most severe, severe and least severe on the basis of mean and standard deviation.

## RESULTS AND DISCUSSION

The data (Table 1) revealed that 51.04 per cent of farmers were found in to the category of medium constraints level where as 22.92 per cent, and 26.04 per cent farmers were found into the categories of low and high constraints levels, respectively, regarding constraints faced by farmers in adoption of drip irrigation system.

**Table 1. Constraints encountered by the farmers in adoption of drip irrigation system N=96**

Sr. No	Category of constraints	Frequency	Percentage
1	Low constraints (score below 85.66)	22	22.92
2	Medium constraints (score from 85.66 to 113.02)	49	51.04
3	High constraints (score above 113.02)	25	26.04
	<b>Total</b>	<b>96</b>	<b>100.00</b>

$$X = 99.34, \quad \sigma = 13.68$$

In depth study of constraints was also conducted and the constraints encountered by respondents in adoption of drip irrigation system were categorized into seven categories namely general, technical, financial, infrastructural, educational, climatic and geographical and miscellaneous constraints.

### General constraints

The data (Table 2) revealed that difficulty in maintenance of drip irrigation system (DIS) regularly was the most perceived constraints (85.76 %) whereas problem of uprooting due to shallow root technology (57.29 %) was the least perceived by the farmers in adoption of drip irrigation system.

**Table 2. General constraints faced by the farmers in adoption of drip irrigation system. N=96**

Sr. No	General constraints	MPS*	Rank
1	Difficulty in maintenance of DIS, regularly	85.76	I
2	Companies/dealers do not provide proper service regarding the drip irrigation sets	83.33	II
3	Irregular supply of electricity in the area	80.90	III
4	Difficult to operate DIS by illiterate people	64.23	IV
5	Spacing varies from crop to crop, so it becomes difficult to change the place to lateral pipes frequency	63.88	V
6	Problem of uprooting due to shallow root technology	57.29	VI

\* Mean percent scores

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**Table 3. Technical constraints faced by the farmers in adoption of drip irrigation system.**

N=96

Sr. No	Technical constraints	M.P.S*	Rank
1	Problem of blocking the drippers due to salt or other impurities in the water	89.23	I
2	High technical skill is required in operation and maintenance of drip irrigation system	86.45	II
3	Non-availability of spare parts at village level	78.47	III
4	Problem of leakage of water in the pipe	73.61	IV
5	Uneven distribution of water due to insufficient pressure of water	63.54	V
6	Regular service is not available from installing agency after sale	61.11	VI
7	Lack of technical know-how about maintenance and repairing of drip irrigation sets	61.11	VI
8	Lack of organizing regular trainings on operation, maintenance, repairing of drip irrigation sets	52.43	VII

\* Mean percent scores

### Technical constraints

The data given (Table 3) revealed that problem of blocking the drippers due to salt or other impurities in the water (89.23 %) was the most perceived constraints whereas lack of organizing regular trainings on operation, maintenance, repairing of drip irrigation sets (52.43 %) was the least perceived by farmers in adoption of drip irrigation system.

### Financial constraints

The data (Table 4) revealed that high initial cost of installing drip set (86.45%) was the most

perceived constraints. The constraint regarding diesel/electrical charges were more expensive (66.31 %) was the least perceived constraints by the farmers in adoption of drip irrigation system.

### Infrastructural constraints

The data (Table 5) revealed that the services provided by the companies were poor after sale (78.12 %) was the most perceived constraints whereas lower quality of pipe and micro-tubes (57.63 %) was the least perceived constraints by the farmers in adoption of drip irrigation system.

**Table 4. Financial constraints faced by the farmers in adoption of drip irrigation System.**

N=96

Sr. No	Financial constraints	M.P.S*	Rank
1	High initial cost of installing drip set	86.45	I
2	Lack of knowledge about government schemes for installing drip sets on subsidized rates	80.20	II
3	Procedure for getting loan from bank / societies is complicated	76.38	III
4	Lack of knowledge of banking facilities for loan	73.61	IV
5	Lack of timely availability of financial help from government through subsidies	70.48	V
6	Extra tank is needed for high pressure	69.79	VI
7	Spare parts of drip irrigation system are costly	68.75	VII
8	High rate of interest on sanctioned loan	67.70	VIII
9	Diesel/ electrical charges are more expensive	66.31	IX

\* Mean percent scores

**Table 5. Infrastructural constraints in adoption of drip irrigation system.**

N = 96

Sr. No.	Infrastructural constraints	M.P.S*	Rank
1	Poor services provided by the companies after sale	78.12	I
2	Insufficient supply of electricity for irrigating fields	75.34	II
3	Shortage of technical staff in the field	74.30	III
4	Availability of spare parts timely	66.66	IV
5	Monopoly of companies in supplying the drip sets for irrigation	65.97	V
6	Inadequate distribution net work in rural areas	63.88	VI
7.	Lower quality of pipe and micro-tubes	57.63	VII

\* Mean percent scores

**Table 6. Educational constraints faced by the farmers in adoption of drip irrigation system.**

N = 96

Sr. No.	Educational constraints	M.P.S*	Rank
1.	Inadequate awareness about the advantage of drip irrigation system	84.04	I
2.	Untrained farmers feel difficulty in using drip irrigation system	77.77	II
3.	Lack of knowledge about operation of drip irrigation system	73.61	III
4.	Lack of individual's contact with experts related to drip irrigation system for effective adoption	71.52	IV
5.	Adequate number of demonstrations were not arranged to motivate and develop skills for its adoption	63.88	V
6.	Lack of systematic campaign for popularizing the drip irrigation system	59.37	VI
7.	Farmers training are not arranged for its adoption	56.59	VII

\* Mean percent scores

### Educational constraints

The data (Table 6) revealed that inadequate awareness about the advantages of drip irrigation system (84.04 %) was the most perceived constraint whereas farmers training is not arranged for its adoption (56.59 %) was the least perceived by the farmers in adoption of drip irrigation system.

### Climatic and geographical constraints

The data (Table 7) revealed that DIS was unsuitable in the areas where water was highly saline which caused choking of emitters (82.29 %) was the most perceived constraints whereas DIS

was unprofitable where land was leveled and ground water available in sufficient quantities (56.25 %) was the least perceived constraints by the farmers in adoption of drip irrigation system.

### Miscellaneous constraints

The data (Table 8) revealed that lack of trainings to improve skills about operation and repairing of parts of DIS (82.98 %) was the most perceived constraint whereas the constraint like nepotism and favoritism in installation of drip irrigation sets (55.55 %) was the least perceived constraints by the farmers in adoption of drip irrigation system.

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**Table 7. Climatic and geographical constraints faced by the farmers**

**N = 96**

Sr. No.	Climatic and geographical constraints	M.P.S*	Rank
1	Unsuitable in the area where water is highly saline which causes choking of emitters	82.29	I
2	High temperature reduces the durability of drip irrigation system	69.79	II
3	Inability to minimize temperature of atmosphere	67.01	III
4	Unsuitable for clay soil	60.41	IV
5	Unprofitable where land is leveled and ground water available in sufficient quantity	56.25	V

\* Mean percent scores

**Table 8. Miscellaneous constraints faced by the farmers in adoption of drip irrigation system.**

**N = 96**

Sr. No.	Miscellaneous constraints	M.P.S*	Rank
1	Lack of organizing trainings to improve skills about operation and repairing of parts of DIS.	82.98	I
2	Lack of measurement of water pressure in lateral distributors	78.81	II
3	Lack of extension efforts in popularizing the DIS for getting maximum benefits from DIS	64.23	III
4	Problem of motivation of farmers towards installation of drip irrigation sets. Inability to minimize temperature of atmosphere	63.54	IV
5	Nepotism and favoritism in installation of drip irrigation sets	55.55	V

\* Mean percent scores

Overall constraints faced by the farmers in adoption of drip irrigation system. The data given in table 9 revealed that financial constraints (73.30 MPS) were the most intensely perceived constraints followed by general constraints (72.56 MPS), technical constraints (70.74 MPS), educational constraints (69.54 MPS), miscellaneous constraints (69.02 MPS), infrastructural constraints (68.84 MPS) and climatic and geographical constraints (67.15 MPS).

**Table 9. Overall constraints faced by the farmers. N=96**

Sr. No.	Constraint	M.P.S*	Rank
1.	Financial	73.30	I
2.	General	72.56	II
3.	Technical	70.74	III
4.	Educational	69.54	IV
5.	Miscellaneous	69.02	V
6.	Infrastructural	68.84	VI
7.	Climatic and geographical	67.15	VII

\* Mean percent scores

## CONCLUSION

The most perceived constraint under general constraints was observed to be difficulty in maintenance of DIS, regularly and problem of blocking the drippers due to salt or other impurities in the water. the most perceived constraint under financial constraints was high initial cost of installing drip set and likewise most perceived Infrastructural constraints was of services provided by the companies were poor after sale. Inadequate awareness about the advantage of drip irrigation system and lack of organizing trainings to improve skills about operation and repairing of parts of DIS was most perceived. amongst all the constraints, financial constraints were the most perceived ones.

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