

RESEARCH ARTICLE :

Constraints faced by farmers in drip irrigation system

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ARTICLE CHRONICLE :

Received :
08.06.2016;
Revised :
20.06.2016;
Accepted :
01.07.2016

SUMMARY : The study was conducted to identify the constraints in adopting the drip irrigation system by collecting data from 150 farmers in Anand and Vadodara Districts of Gujarat. The data analyzed by statically tools. The constraints were grouped into four categories viz., economic, technological, administrative and personal socio-psychological constraints. The major constraints faced by farmers in adopting drip irrigation system were time-to-time attention for minor repairs (3.88), inadequate and uncertainly in power supply (3.86), frequent clogging of drippers and microtubes (3.78), heavy initial expenses (3.56) and lack of technical know-how as well as lack of proper training.

How to cite this article : Parmar, S.D. and Thorat, G.N. (2016). Constraints faced by farmers in drip irrigation system. *Agric. Update*, 11(3): 229-233, DOI : 10.15740/HAS/AU/11.3/229-233.

KEY WORDS :

Constraints, Adoption, Drip irrigation system (DIS)

BACKGROUND AND OBJECTIVES

The agriculture sector occupies a prominent place in the economy of Gujarat. The contribution of agriculture sector is around 35 to 50 per cent in state domestic product. However, such contribution is not stable due to erratic and irregular pattern of rainfall. The total (196 Lakh hectares) geographical area of the state, only 94.99 lakh hectares of land is cultivated and 36.27 per cent of land uses the irrigation facilities (Anonymous, 2006).

The water is a major natural resource which is limiting factor in agricultural production. Therefore, it is necessary to adopt water management technology for utilizing the available water resources. At the end of this century, a drop of water will be more costlier than the drop of oil.

The drip irrigation systems are the advanced methods of irrigation for overcoming the various problems of water losses and other problems such as labour, money and water management. Various efforts are being made at various levels for diffusing the drip and water management technologies at Government level, University level and some private organizations.

The benefits of a technology are actually derived only when it is efficiently used by the farmers at their local situation. However, many of them could not do so because of a large number of constraints coming up in the way. Constraints imply forcible restriction and confinement of action. Considering the importance of drip irrigation system in effective water management and its knowledge and

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adoption among the farmers, efforts have been made to study the constraints that come across in the adoption of drip irrigation system. With this background in view, the present investigation is a modest endeavour to study the constraints faced by the farmers using drip irrigation system.

RESOURCES AND METHODS

The present study was conducted in two talukas from Anand district and eight talukas from Vadodara districts were selected. A list of talukas along with total number of drip sets installed in farmers' orchards was obtained from the office of the Gujarat Green Revolution Company Ltd., Vadodara. Thus, having maximum number of drip sets in farmers' orchards 95.00 per cent of the Anand district and 90.00 per cent of Vadodara district's drip sets in the talukas were selected. From each village, 5 respondents were randomly selected for the study which constituted a total sample size of 150 respondents.

It was operationalized as the items of difficulties faced by the respondents in adoption of drip irrigation system. With a view to identify the inhibitors of drip irrigation system use, a list of 35 specific constraints items was prepared initially based on literature available, discussions with the scientists and field extension functionaries and informal interview with a group of about 40 DIS adopter farmers other than the respondents of the study. These constraints were grouped into four categories *viz.*, economic, technological, administrative and personal socio-psychological constraints. Thereafter, the constraints were got rated by the respondents on a four-point continuum by asking them to indicate the extent to which each constraint was perceived as hindering the adoption of DIS.

The four responses categories provided against each constraint were "very much", "much", "not so much" and "not at all" with scores of 3, 2, 1 and 0, respectively. The total weighted score for each constraint was computed by summoning the frequencies of respondents in different response categories. The mean weighted score was calculated by dividing the total weighted score with the number of respondents. The constraints were ranked on the basis of mean weighted scores.

OBSERVATIONS AND ANALYSIS

The details of constraints faced by the farmers in adopting regarding drip irrigation in their order of

importance are presented in Table 1.

Economic constraints :

The perusal of data presented in Table 1, reveal that out of the five economic constraints experienced by the respondents in adoption of DIS, respondents had assigned first rank to heavy initial expenses for installation DIS (3.56) followed by equipment and spare parts of drip irrigation system are costly (3.40), lack of capital for covering entire area under DIS (3.14), addition tank required for proper pressure (2.56) and lack of credit facilities to farmers (1.89), respectively.

Thus, it can be concluded that the major economic constraints were observed as, heavy initial expenses and equipment/spare parts of drip irrigation system are costly.

Technical constraints :

It is evident from the Table 1, that improper pressure hinders uniform distribution of water (3.88) was perceived as most important constraint and occupied first position within the category. Followed by clogging of drippers and microtubes (3.78), time-to-time attention for minor repair (3.48), lack of technical know-how (3.30), training required (2.88), awareness among the benefits of DIS (2.54), water leakage (2.01), proper water pressure maintain (1.92), technologically complicated (1.68), difficulty in weeding within rows (1.41) and difficulty in interculturing (1.24), respectively.

It clearly indicates that, the improper pressure hinders uniform distribution of water, clogging of drippers due to salt deposition and other impurities, essentiality of technical knowledge and complexity of the system were the main technical constraints (Vora, 1993 and Desai, 1997).

Administrative (extension) constraints :

A glance at Table 1, indicates that the more constraints perceived by drip adopters with respect to administration (extension) were, inadequate and uncertainly in power supply was first major constraint followed by lack of proper training, non-availability of spare parts at proper time with reasonable rates, lack of after sell services got second, third and fourth rank, respectively. Non-availability of technical guidance in time, clumsy procedure for loan/subsidy, delay in sanction of loan/subsidy and lack of credibility of extension workers were the fifth, sixth, seventh and eighth most important problems face by them adoption in DIS. It is

evident from the above results that, Inadequate and uncertainly in power supply, lack of proper training, non-availability of spare parts at proper time with reasonable rates, lack of after sell services were major administrative (extension) constraints (Chaudhari, 1995).

Personal and socio-psychological constraints :

The data reported in Table 1, reveals that the personal and socio-psychological constraints are concerned lack of spirit among the farmers regarding DIS first rank constraints followed by lack of motivation, frustration due to failure of DIS in work and resistance from family members were second, third and fourth ranked constraints, respectively. It is evident from the above results concerned lack of spirit among the farmers regarding DIS was the main constraint under personal

and socio-psychological constraints category.

From the overall discussion it could be concluded that the main constraints faced by the farmers in adoption and usage of drip irrigation system were, heavy initial expenses, costly equipment and spare parts of the system, improper pressure hinders uniform distribution of water, clogging of dripper and microtubes due to salt deposition and other impurities, inadequate and uncertainly in power supply, unavailability of technical person and guidance from extension workers, complicated procedure for getting subsidy/loan from Government, inconvenience to perform interculturing operation, regular maintenance of the system etc.

The present findings are in conformity with those reported by Anonymous (1989-90); Ingle and Sagane (1992); Phadtare *et al.* (1992); Puranik *et al.* (1992);

Table 1: Details of constraints faced by the farmers regarding adoption of drip irrigation system			(n=150)
Sr. No.	Type of constraints (Category-wise)	Mean score	Rank order effectiveness
Economic constraints			
1.	Heavy initial expenses for installation DIS	3.56	I
2.	High equipment / spare parts of drip irrigation system are costly	3.40	II
3.	Lack of capital for covering entire area under DIS	3.14	III
4.	Addition tank required to get proper pressure	2.58	IV
5.	Lack of credit facilities to farmers	1.89	V
Technical constraints			
1.	Required time-to-time attention for minor repairs	3.88	I
2.	Frequent clogging of drippers and microtubes	3.78	II
3.	Lack of technical know-how	3.48	III
4.	Training requirement	3.30	IV
5.	Lack of awareness among the farmers regarding benefits of DIS	2.88	V
6.	Improper pressure hinders discharge rate	2.54	VI
7.	Problems of water leakages in the system	2.01	VII
8.	Difficult to keep proper water pressure	1.92	VIII
9.	Technologically complicated	1.68	IX
10.	Difficulty in weeding within the rows	1.41	X
11.	Difficulty in interculturing	1.24	XI
Administrative (extension) constraints			
1.	Inadequate and uncertainly in power supply	3.86	I
2.	Lack of proper training	3.49	II
3.	Non-availability of spare parts at proper time with responsible rates	3.28	III
4.	Lack of after sell service from the company dealers	3.08	IV
5.	Non-availability of technical guidance in time	2.61	V
6.	Clumsy procedure for getting loan/subsidy	2.06	VI
7.	Delay in sanction of loan/subsidy	1.86	VII
8.	Lack of credibility of extension workers	1.28	VIII
Personal and socio-psychological constraints			
1.	Lack of spirit among the farmers regarding DIS	1.75	I
2.	Lack of motivation	1.39	II
3.	Frustration due to failure of DIS in work	1.12	III
4.	Resistance from family members	0.81	IV

Patil (1990); Patel (1997) and Kalasariya *et al.* (2003).

Suggestions to overcome the constraints experienced by the respondents :

An attempt was also made to know the suggestions of the respondents to overcome the constraints and thereby promoting the use of DIS. The respondents' suggestions were elicited through a simple open-ended question. They were asked to suggest possible solution(s) in form of their suggestions to overcome the constraints associated with adoption of DIS and thereby promoting the use of drip irrigation system. Number of respondents making the same suggestion(s) was counted in frequency and then percentage of the respondents making the same suggestion(s) was calculated.

Inviting suggestions from the respondents is always desirable as well as advantageous. They provide strong to make the programme more perfect and viable by eliminating bottlenecks.

Keeping this in view, the drip adopters were asked to suggest possible solutions to overcome the constraints associated with adoption of drip irrigation system. The suggestions were compiled and percentage was calculated to arrange them from highest to lowest percentage as presented in Table 2.

A perusal of data presented in Table 2, reveals that a thumping majority of the drip adopters endorsed suggestions for provisions should be made to purchase DIS sets directly from open market (94.00 %), training should be imparted for betterment of knowledge/skill to use the system efficiently and effectively (90.66 %) and provisions of regular guidance on maintenance and free service from company agents (80.66 %). The next notable suggestions given were, at least five years guarantee against DIS sets should be provided by company (72.67 %), demonstrations by manufactures

should be organized frequently (64.00 %), spare parts of the system should be available locally at reasonable rates (60.00 %). The other suggestions were and technical know-how of the system should be provided through combination of media (58.66 %). Half of the drip adopters (49.37 %) suggested for increase in subsidy/loan and should be made available timely.

From the whole discussion, it could be concluded that the important suggestion endorsed by the farmers to overcome the constraint faced by them in adoption and usage of drip irrigation system were, provisions should be made to purchase DIS sets directly from open market, training should be imparted for betterment of knowledge/skill to use the system efficiently and effectively, provisions of regular guidance on maintenance and free service from company agents, etc. should be made readily available on reasonable rates and provision for technical know-how of the system. Similar suggestions were also reported by Kandaswamy (1990); Ingle and Sagane (1992); Phadtare *et al.* (1992); Puranik *et al.* (1992); Narayanmoorthy (1997) and Kalasariya *et al.* (2003).

Conclusion:

From the above findings it can be concluded that heavy initial expenses, costly equipment and spare parts of the system, improper pressure hinders uniform distribution of water, clogging of dripper and microtubes due to salt deposition were the major constraints as perceived by the respondents in adoption of drip irrigation technology. The suggestions as sought out from the respondents overcome the constraints were: provisions should be made to purchase DIS sets directly from open market, training on drip origination technology should be imparted for betterment of knowledge/skill to use the system efficiently and effectively. Subject matter specialists and Agricultural Extension Officers should visit

Table 2 : Suggestions to overcome the constraints faced by the farmers regarding adoption of drip irrigation system

Sr. No.	Suggestions	Respondents	
		Number	Percentage
1.	Provisions should be made to purchase DIS sets directly from open market	141	94.00
2.	Training should be imparted for betterment of knowledge/skill to use the system efficiently and effectively	136	90.66
3.	Provisions of regular guidance on maintenance and free service from company agents	121	80.66
4.	At least five years guarantee against DIS sets should be provided by company	109	72.67
5.	Demonstrations by manufactures should be organized frequently	96	64.00
6.	Spare parts of the system should be available locally at reasonable rates	90	60.00
7.	Technical know-how of the system should be provided through combination of media	88	58.66
8.	Increase in subsidy/loan and should be made available timely	79	49.37

the farmers' field and guide them to solve the field problems in accordance with resources available with drip owners. The cost of essential inputs needs to be subsidized to accelerate adoption rate. All the possible efforts should be made to overcome the major constraints related to finance and assured supply of inputs.

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