Eco. Env. & Cons. 30 (Nov. Suppl. Issue) : 2024; pp. (S270-S274)
Copyright@ EM International
ISSN 0971–765X

DOI No. http://doi.org/10.53550/EEC.2024.v30i07s.049

Constraints faced by the farmers in adoption of drip irrigation system in Bhilwara district of Rajasthan

Keshav Kumar[1]*, G.L. Meena[2], Latika Sharma[3], Hari Singh[4], S.S. Burdhak[5] and S.S. Sharma[6]

[1,2,3,4,5]Department of Agricultural Economics and Management,
[6]Department of Plant Pathology,
Rajasthan College of Agriculture, MPUAT, Udaipur 313 001, Rajasthan, India

(Received 3 May, 2024; Accepted 5 July, 2024)

ABSTRACT

The study conducted an in-depth analysis of various constraints- financial, infrastructural, technical, and general- that hinder the adoption of drip irrigation. It was carried out in the Aasind tehsil of Bhilwara district, with a sample of 40 respondents. The key constraints identified included high initial installation costs and expensive equipment or spare parts (financial), insufficient electricity supply and poor after-sales service from companies (infrastructural), emitter or dripper clogging and damage to laterals by rats or squirrels (technical), and varying spacing requirements for different crops and difficulties in inter-cultivation (general).

Key words: *Drip-irrigation, Finance related constraints, Infrastructural constraints, Technical constraints, General constraints, Clogging of emitter.*

Introduction

Water is becoming scarce day by day, which impedes agricultural development in practically every part of the world. Water scarcity is one of the most significant limitations on agricultural production in India than land. Whether food security is achieved, both in India and globally, largely depends on how effectively we develop and manage our limited water resources. Demand for water across all major sectors in India is increasing impulsively and demand management mechanisms have emerged as the primary means of managing the country's limited water supplies.

Since agriculture accounts for 78 per cent of India's fresh water consumption, the demand management system in water-scarce and water-stressed areas should be of particular importance for sustainable management of water resources (Kumar, 2008).

Due to widespread water shortages in the country, micro irrigation systems have become more popular. Their use has been good for both the economy and society. They help crops grow better and use less energy and chemicals like pesticides and fertilizers. Also, they help save groundwater, reduce the cost of weeding and relief from labour migration because of water shortages (Viswanathan and Bahinipati, 2015).

The cutting-edge irrigation technique drip irrigation has to introduce in order to increase irrigated area in Rajasthan. Increased irrigation efficiency can be achieved by using water-saving irrigation technique drip irrigation.Cost is a significant factor in determining whether a micro irrigation system is economically viable or not. It is a crucial economic indicator for those who use drip irrigation systems, including farmers, consumers and policymakers, in order to establish an efficient relationship between

producers and consumers for logically determining the price of crop output.

In the district of Bhilwara, there is a lot of potential for increasing the effectiveness of current water irrigation projects. Therefore, an attempt has been made to calculate the water productivity, costs and profitability of crop production in this study.

Rajasthan faces significant challenges with water scarcity, uneven rainfall, recurring droughts, sandy soils, and undulating topography. Given these conditions, adopting a drip irrigation system is crucial. However, many farmers still rely on traditional irrigation methods, leading to substantial water wastage. This study aims to identify the constraints farmers face in adopting the drip irrigation system.

Materials and Method

This study was conducted in the Bhilwara district of Rajasthan, specifically focusing on the Aasind tehsil due to its extensive area and large number of farmers benefiting from the drip irrigation system. Two villages within this tehsil were chosen, and 20 farmers from each village were interviewed, resulting in a total sample of 40 respondents. Data collection was carried out through personal interviews using an interview schedule. The gathered data were then classified, tabulated, and statistically analyzed.

Results

Various constraints like finance related, infrastructural, technical and general constraints in adoption of drip irrigation have been presented based on the sample farmer response.

Finance-related constraints in adoption of drip-irrigation system Top of Form

The finance related constraints faced by farmers in adoption of drip-irrigation system have been depicted in Table 1. The findings of the study about the finance related constraints revealed that the sample farmers felt that high initial installation cost (first rank) was a serious constraint with Garrett score of 66 followed by high cost of equipment/ spare part (with Garrett score of 34), inadequate subsidy (with Garrett score of 22) andtime consuming and complicated process of loan (with Garrett score of 78) were ranked as the second, third and fourth constraints. This finding is in line with the finding of studied like Pandya and Dwivedi (2016). The sample farmers facing least problem with high rate of interest on loan (with Garrett score of 43), inadequate credit facilities for farmers (with Garrett score of 57) and high maintenance cost of equipment (with Garrett score of 50) which were ranked as fifth, sixth and seventh constraints in the order of seriousness of constraints.

Infrastructural constraints in adoption of drip-irrigation system

The infrastructural constraints faced by farmers in adoption of drip-irrigation system have been depicted in Table 2. Insufficient supply of electricity to irrigate the field was a serious problem that was faced by farmer in study area, that is why it stood on first position with Garrett score 54 followed bypoor

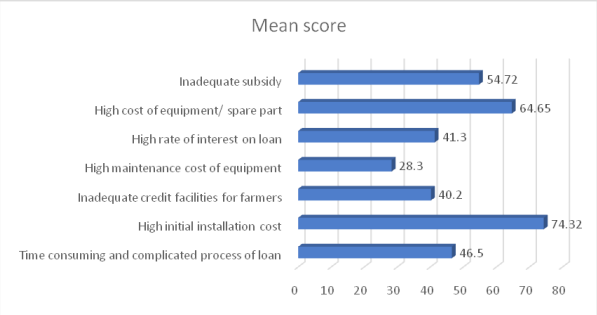

Fig. 1. Finance-related constraints in adoption of drip irrigation system

Table 1. Finance-related constraints in adoption of drip irrigation system (n=40)

S. No.	Finance-related Constraints	Per cent position	Garrett score	Mean score	Rank
1.	Time consuming and complicated process of loan	7.14	78	46.50	IV
2.	High initial installation cost	21.42	66	74.32	I
3.	Inadequate credit facilities for farmers	35.71	57	40.20	VI
4.	High maintenance cost of equipment	50.00	50	28.30	VII
5.	High rate of interest on loan	64.28	43	41.30	V
6.	High cost of equipment/ spare part	78.57	34	64.65	II
7.	Inadequate subsidy	92.85	22	54.72	III

after sales service of the companies, which stood on the second position (with Garrett score 23). Other constraints like distant location of market of equipment (with Garrett score 63), non- availability of spare parts in time(with Garrett score 77), poor quality of pipes, micro-tubes and spare parts (with Garrett score 37) andinadequate suppliers of equipment and spare parts (with Garrett score 46) were ranked as third, fourth, fifth and sixthin the order of

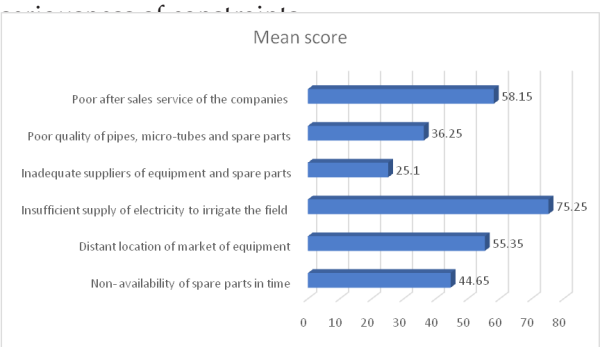

Fig. 2. Infrastructural constraints in adoption of drip irrigation system

Technical constraints in adoption of drip-irrigation system

The technical constraints faced by farmers in adoption of drip-irrigation system have been depicted in Table 3. The findings of the study about the technical constraints revealed that the sample farmers felt that clogging of emitter or drippers (first rank) was a serious constraint with Garrett score of 75 followed bydamage of laterals by rat/squirrel and others (with Garrett score 60), lack of knowledge about pressure and pressure gauge (with Garrett score 24), lack of technical know-how to operate and maintain of drip irrigation system(with Garrett score 40) and blockage of water pipe line (with Garrett score 50) were ranked as the second, third, fourth and fifth constraintsin the order of seriousness of constraints. This finding is in line with the findings of various studied like Chovatia *et al.* (2019), Patil and Poddar (2016), Yadav *et al.* (2017), Hiremath and Makadia (2021), Karki *et al.* (2023), Bhuriya *et al.* (2015) and Karki *et al.* (2023).

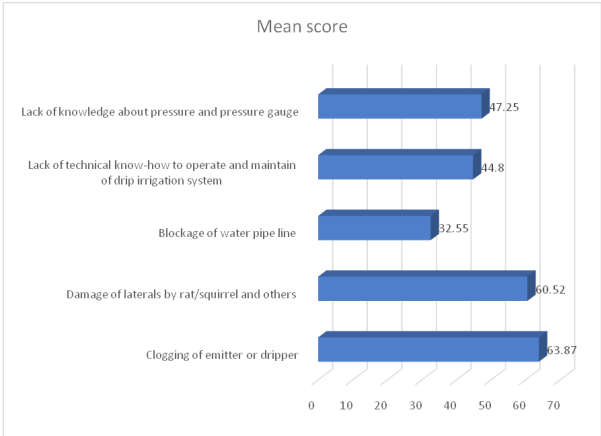

Fig. 3. Technical constraints in adoption of drip irrigation system

Table 2. Infrastructuralconstraints in adoption of drip irrigation system (n=40)

S. No.	Infrastructural Constraints	Per cent position	Garrett score	Mean score	Rank
1.	Non- availability of spare parts in time	8.33	77	44.65	IV
2.	Distant location of market of equipment	25.00	63	55.35	III
3.	Insufficient supply of electricity to irrigate the field	41.67	54	75.25	I
4.	Inadequate suppliers of equipment and spare parts	58.33	46	25.10	VI
5.	Poor quality of pipes, micro-tubes and spare parts	75.00	37	36.25	V
6.	Poor after sales service of the companies	91.67	23	58.15	II

Table 3. Technicalconstraints in adoption of drip irrigation system (n=40)

S. No.	Technica Constraints	Per cent position	Garrett score	Mean score	Rank
1.	Clogging of emitter or dripper	10.00	75	63.87	I
2.	Damage of laterals by rat/squirrel and others	30.00	60	60.52	II
3.	Blockage of water pipe line	50.00	50	32.55	V
4.	Lack of technical know-how to operate and maintain of drip irrigation system	70.00	40	44.80	IV
5.	Lack of knowledge about pressure and pressure gauge	90.00	24	47.25	III

Table 4. General constraints in adoption of drip irrigation system (n=40)

S. No.	General Constraints	Per cent position	Garrett score	Mean score	Rank
1.	Problem in Inter-cultivation operations	6.25	80	64.80	II
2.	Irrigation to be done more frequently	18.75	68	60.60	III
3.	Monopoly of suppliers in supplying the drip sets for irrigation	31.25	60	53.80	IV
4.	Problem of uprooting	43.75	53	38.00	VI
5.	Expensive irrigation charges (diesel/electricity)	56.25	47	37.60	VII
6.	More depth of ground water	68.75	40	50.00	V
7.	Spacing varies from crop to crop, so it becomes difficult to change the place to lateral pipes frequency	81.25	32	70.40	I
8.	Poor quality of irrigation water	93.75	20	24.80	VIII

General constraints in adoption of drip-irrigation system

The general constraints faced by farmers in adoption of drip-irrigation system have been depicted in Table 4. The findings of the study about the general constraints revealed that the sample farmers felt that spacing varies from crop to crop (first rank) was a serious constraint with Garrett score of 32 followed byproblem in inter-cultivation operations with (Garrett score 80), irrigation to be done more frequently with (Garrett score 68), monopoly of suppliers in supplying the drip sets for irrigation (with Garrett score60) and more depth of ground water (with Garrett score40) were ranked as the second, third, fourth and fifth constraints. This finding is in line with the findings of various studied like Yadav *et al.* (2017), Mashaliya *et al.* (2020) and Patil and Podder (2016). The sample farmers facing least problemwith problem of uprooting with (Garrett score 53), expensive irrigation charges (diesel/electricity) (with Garrett score 47) and poor quality of irrigation water (with Garrett score 20) which were ranked as sixth, seventh and eighth constraints in the order of seriousness of constraints.

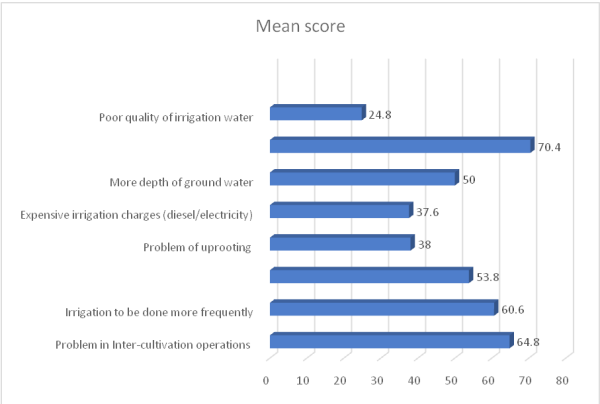

Fig. 4. General constraints in adoption of drip irrigation system

This finding revealed that high initial installation cost and high cost of equipment/spare part (finance related), insufficient supply of electricity and poor after sales services of companies (infrastructural), clogging of emitter or dripper and damage of laterals by rats/squirrel and others (technical) and spacing varies from crop to crop and problem in inter-cultivation (general) were the serious constraints in adoption of drip irrigation. The sample farmers were facing least problem with inadequate credit facilities for farmers (finance related), inadequate suppliers of equipment and spare part (infrastructural), blockage of water pipe line (technical) and expensive irrigation charges (general).

Conflict of Interest - None

References

Bhuriya, M., Choudhary, S. and Swarnakar, V. 2015. Study of adoption behaviour of drip irrigation system on chilli crop in Barwani district of MP. *Journal of Agriculture and Veterinary Science.* 8(12): 12-14.

Chovatia, J.V., Savaliya, V.M., Sindhi, S.J., Gorfad, P.S. and Kalsariya, B.N. 2019. Constraints confronted by the cotton growers of Saurashtra region in adoption of drip irrigation system (DIS). *Journal of Pharmacognosy and Phytochemistry*. 8(5): 365-367.

Hiremath, D. and Makadia, J.J. 2021. Issues in adoption of drip and conventional irrigation methods in banana: A socio-economic analysis of South Gujarat region. *International Journal of Agriculture, Environment and Biotechnology.* 14(3): 341-347.

Karki, P., Amardeep, M.A., Kameswari, V.L.V. and Adhikari, Y.S. 2023. A study on constraints faced by farmers in drip irrigation in Nainital district of Uttarakhand. *The Pharma Innovation Journal.* 12(1): 1715-1717.

Kumar, M.D. 2008. Managing water in the face of grow-

ing scarcity, inequity and declining returns: exploring fresh approaches. *International Water Management Institute.* 2: 1-523.

Mashaliya, K.V., Prajapati, R.R. and Patel, P.H. 2020. Constraints faced by the potato growers in adoption of micro irrigation technology. *Gujarat Journal of Extension Education.* 31(2): 101-103.

Pandya, P.A. and Dwivedi, D.K. 2016. Constraints in adoption of drip irrigation. *Advances in Life Sciences*. 5(6): 2405-2411.

Patil, B.O. and Poddar, R.S. 2016. Financial feasibility of drip irrigation system in grape cultivation. *International Journal of Agriculture, Environment and Biotechnology*. 9(4): 617-624.

Viswanathan, P. K. and Bahinipati, C.S. 2015. Exploring the socio-economic impacts of micro-irrigation system (mis): A case study of public tube wells in Gujarat, Western India. *South Asia Water Studies Journal.* 5(1): 1-25.

Yadav, K., Yadav, J.P. and Kumari, A. 2017. Constraints encountered by the farmers in adoption of drip irrigation system in Jaipurdistrict. *Journal of Krishi Vigyan.* 6(1): 32-36.