



ISSN (E): 2277-7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2023; 12(1): 1715-1717  
© 2023 TPI

[www.thepharmajournal.com](http://www.thepharmajournal.com)

Received: 27-11-2022

Accepted: 30-12-2022

## Pooja Karki

Research Scholar,  
Department of Agricultural  
Communication, College of  
Agriculture, GBPUA&T,  
Pantnagar, Uttarakhand, India

## Amardeep

Associate Professor,  
Department of Agricultural  
Communication, College of  
Agriculture, GBPUA&T,  
Pantnagar, Uttarakhand, India

## MA Ansari

Professor, Department of  
Agricultural Communication,  
College of Agriculture,  
GBPUA&T, Pantnagar,  
Uttarakhand, India

## VLV Kameswari

Head and Professor,  
Department of Agricultural  
Communication, College of  
Agriculture, GBPUA&T,  
Pantnagar, Uttarakhand, India

## Yogendra Singh Adhikari

Research Scholar, Dr. Y. S.  
Parmar University of  
Horticulture and Forestry,  
Nauni, Himachal Pradesh, India

## Corresponding Author:

### Pooja Karki

Research Scholar,  
Department of Agricultural  
Communication, College of  
Agriculture, GBPUA&T,  
Pantnagar, Uttarakhand, India

## A study on constraints faced by farmers in drip irrigation in Nainital district of Uttarakhand

**Pooja Karki, Amardeep, MA Ansari, VLV Kameswari and Yogendra Singh Adhikari**

### Abstract

The present study was undertaken to identify the constraints faced by the farmers in adoption of drip irrigation technique in Ramgarh block in Nainital district of Uttarakhand. Four villages were selected through purposively and total 120 respondents were selected by PPS (Probability Proportionate to Size) sampling method for the study purpose. The data were collected by personal interview schedule with open-end questions and appropriate statistical procedure was employed to analyze the data. The results of the study demonstrate that among all the constraints the farmers observed technical constraints were most prominent whereas, financial constraints were preserving by least prominent in adoption of drip irrigation technique.

**Keywords:** Constraints, drip irrigation, probability, financial

### Introduction

Water is the most essential natural resource that limits agricultural productivity and sustainable agriculture (Parmar and Thorat, 2016) [7]. As a result, water management technologies must be implemented in order to utilize existing water resources in a sustainable manner. Drip irrigation is an efficient technique or method of providing irrigation water directly into soil at near the root zone of plants and minimizes various problems conventional irrigation losses i.e. surface water, runoff soil erosion (Swetha *et al.*, 2017) [12] and other problems i.e. money labour and water management (Parmar and Thorat, 2016) [7]. It is a modern type of irrigation techniques that not only resolves obstacles for farmers but also plays an important part in the efficient and correct use of water in agriculture. This system is rapidly expanding all over the world, especially in the water scarce areas as well as rainfed areas of developed countries. Uttarakhand is one of the Indian states where farmers mainly use two types of agricultural practices: rainfed farming and irrigated farming (Agricultural Department Govt. of Uttarakhand). The rainfed area requires effective and consistent irrigation water management, notably to reduce water waste from traditional irrigation. Water supply for agriculture is limited in hilly places of Uttarakhand due to factors such as unequal land holding, slope terraces, and long distances between water resources and fields. However, adoption rate of drip irrigation is very low in Uttarakhand compared to other states of Rajasthan, Maharashtra and Madhya Pradesh etc. Farmers abandoned drip irrigation in numerous situations, even after adopting it, due to a lack of maintenance, a lack of technical expertise, a lack of training facilities, a shortage of replacement parts (Kulecho and Weatherhead, 2005) [4]. It is now necessary to investigate the causes or facts that are accountable for the limited adoption of this valuable technology. Keeping these facts in mind, the present study was carried out to identify the primary barriers to the adoption of the drip irrigation techniques.

### Materials and Methods

The research was carried out in Nainital district of Uttarakhand. Nainital district was specifically chosen since it has a larger region where the farmers mostly adopt drip irrigation techniques in commercial cultivated crops. Purposive sampling method was applied to select one block, Ramgarh, and four villages, namely Boharakot, Jhutia, Naikana, and Losgyani, because the majority of the farmers had adopted drip irrigation in their fields and had ceased the drip irrigation technique. As a result, a total of 120 respondents were drawn from these four villages using the PPS (Probability Proportionate to Size) sampling method. The data was collected with the help of interview schedule.

The respondents were asked open ended questions on their issues with drip irrigation adoption. All the issues raised by respondents were documented and classified as constraints; these constraints were categorized into different categories such as technical constraints, climate and geographical

constraints, infrastructural constraints, educational constraints and financial constraints. The data was classified, tabulated, analysed and interpreted using statistical methodologies and processes.

**Table 1:** Different constraints perceived by the respondents in adoption of drip irrigation technique

S.no	Constraints	Frequency	Percentage	Rank
<b>a.</b>	<b>Technical Constraints</b>			
1.	Micro tubes are sensitive for clogging	100	83.33	I
2.	Frequently require of maintenance	92	76.66	II
3.	Mechanical damage to drip system by rodents	25	29.17	IV
<b>b.</b>	<b>Climate and Geographical Constraints</b>			
1.	Frost sensitive pipe of drip irrigation	65	54.17	I
2.	Cracks to pipe line and micro tube	60	50	II
3.	Small land holding for drip irrigation	55	45.83	III
4.	Undulating field or fragmented land created problem in drip irrigation	43	35.83	IV
<b>c.</b>	<b>Infrastructural Constraints</b>			
1.	Timely spare parts are not available	100	83.33	I
2.	Lack of water availability or infrastructure for water storage	45	37.50	II
<b>d.</b>	<b>Educational Constraints</b>			
1.	Lack of technical knowledge about operating drip irrigation technique	80	66.67	I
2.	Lack of training in respect of use of drip irrigation	65	54.16	II
3.	Uneducated farmers are feel difficulty is using drip irrigation technique	50	41.67	III
<b>e.</b>	<b>Financial Constraints</b>			
1.	Difficulty in getting subsidy	30	25	I
2.	High cost in installation	8	6.67	II

## Results and Discussion

### a. Technical Constraints

The analysis of data on technical constraints reported in table 1 revealed that constraint such as micro tubes are sensitive to clogging were the most perceived technical constraints by 83.33 percent of respondents and occupied first ranked. Whereas, frequently require of maintenance rated as rank second most critical technical constraints by 76.66 percent of respondents. Mechanical damage to the drip system by rodents occupied 29.17 percent was reported to be the third major constraint. The data clearly reveal that technical constraints one of the most serious issues where the respondents encountered a variety of challenges in implementing drip irrigation. Due to rodent damage and micro tube clogging, it required frequent maintenance, which might be one of the most important constraints in the research area. The findings of the present study are similar to Badole (2014)<sup>[1]</sup> and Parihar (2017)<sup>[6]</sup> who reported that clogging of micro tube as constraint faced by majority of respondents.

### b. Climate and Geographical Constraints

According to the data in table 1, the constraint like frost sensitive pipe of drip irrigation was perceived by 54.17 percent of respondents and occupied ranked first in climate and geographical constraints in priority of adoption of drip irrigation. About 50 percent of the farmers faced the problem of cracks to pipeline and micro tube were ranked second. Whereas 45.83 percent of respondents identified in small landholding for drip irrigation as major constraints in adoption of drip irrigation which occupied ranked third followed by 35.83 percent of respondents considered in undulating field or fragmented land created problem in drip irrigation which ranked fourth.

It might be because the majority of the respondents suffered various problems owing to climate and geographical constraints such as fragmented of land due to joint family

partition and undulating land, which created a problem in adoption. The pipeline and micro tube become harder and creaked due to frost in winter and high temperature in summer which is most important constraint faced by respondent under climate condition. The present findings are in conformity with those reported by Sengar (2003)<sup>[10]</sup> and Reddy (2005)<sup>[9]</sup>.

### c. Infrastructural Constraints

The perusal of data presented Table 1 indicated that the most perceived infrastructural constraint was the timely spare parts are not available which was reported by 83.33 percent of respondents and occupied ranked first. Whereas, lack of water availability or infrastructure for water storage was considered to be the second ranked which was perceived by 37.50 percent of respondents. According to the data, majority of the respondents were faced major constraints such as a lack of spare parts owing to a lack of transportation facilities purchase by the city and inadequate infrastructure for water storage due to a lack of suitable tank and pond in the village. These findings are comparable to those of Verma and Sharma (2017)<sup>[14]</sup>; Dhirabhai (2015)<sup>[2]</sup> who founded that timely spare parts are not available was the major constraint by the respondents.

### d. Educational Constraints

According to educational constraints data presented in table 1 revealed that 66.67 percent of respondents perceived a lack of technical knowledge about operating drip irrigation technique and rated first. Lack of training in respect of use of drip irrigation was perceived by 54.16 percent of respondents and ranked second. Whereas, 41.67 percent of respondents considered uneducated farmers are feel difficulty is using drip irrigation technique and ranked third constraint in drip irrigation technique adoption. Based on the findings of the study, majority of the respondents faced various problems in adopting of drip irrigation including a lack of knowledge

about how to operate drip irrigation techniques and uneducated farmers who perceived difficulty using drip irrigation techniques might be due to lack of training and field demonstration in their field. The findings are supported by Ulemale *et al.* (2003) <sup>[13]</sup> and Patel *et al.* (2012) <sup>[8]</sup> who concluded that lack of technical knowledge and training facilities were the major constraints in adoption of drip irrigation system.

#### e. Financial Constraints

From the above results of financial constraints shown in table 1, the respondents faced the problem of getting subsidy from the government. The data revealed that 25 percent of respondents facing constraint difficulty in getting subsidy and occupied ranked first under financial constraints. However, high cost in installation was felt by 6.67 percent of respondents and ranked second. The results of the study show that respondents had difficulty obtaining subsidy which might be due to large initial investment for the installation of a drip irrigation system, a high rate of interest on loans and lack of timely technical guidance for farmers. The findings shows similarity with findings of Namara *et al.* (2007) <sup>[5]</sup>; who reported that the main constraint faced by the farmers was difficulties in obtaining subsidies.

#### Conclusions

In general, the results concluded that among all the constraints recognized by the farmers, technical constraints were the most relevant and financial constraints were the least important in adoption of drip irrigation technique. This problem can be solved by implementing appropriate extension strategies such as an organised training programme, field demonstrations, the establishment of coordination and the availability of day to day survives to farmer door which will provide them with sufficient knowledge about the existing gap in drip irrigation technology used by the farmers.

#### Acknowledgment

I am grateful to my adviser, professors, parents, friends, and farmers for their encouragement and assistance in completing the study work.

#### References

1. Badole H. Study on adoption of drip irrigation technology among vegetable growers in Khandwa district of Madhya Pradesh. M.Sc. Thesis. Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior (India).
2. Dhirabhai SM. Status and prospect of drip irrigation system: A market analysis of Anand district in Gujarat. M.sc. Thesis. International Agribusiness Management Institute Anand Agricultural University, Anand Gujarat (India).
3. Ghintala A, Singh K. Knowledge and adoption of sprinkler irrigation system by the farmers of Banaskantha district of North Gujarat. Indian Journal Extension Education and Research Development. 2013;21:26-29.
4. Kulecho IK, Weatherhead EK. Reasons for smallholder farmers discontinuing with low cost micro irrigation: A case study from Kenya. Irrigation and Drainage Systems. 2005;19:179-188.
5. Namara RE, Nagar RK, Upadhyay B. Economics, adoption determinants, and impacts of micro-irrigation technologies: empirical results from India. Irrigation

6. Science. 2007;1(25):283-297.
6. Parihar G. Study on adoption behaviour of farmers towards drip irrigation system (DIS) in Dhar block of Dhar District (M.P.). M.Sc. Thesis. R.A.K. College of Agriculture, Sehore, Maharashtra, 2017.
7. Parmar SD, Thorat GN. Constraints faced by farmers in drip irrigation system. Agriculture Update. 2016;11(3):229-223.
8. Patel YS, Choudhary S, Swankar VK. Adoption behaviour of drip irrigation system of vegetable growers. International Journal of Innovative Research and Development. 2012;1(11):319-325.
9. Reddy N. Study on knowledge, extent of participation and benefits derived by participant farmers of the watershed development programme in Raichur district of Karnataka state. M.Sc. Thesis. University of Agricultural Sciences, Dharwad, Karnataka, 2005.
10. Sengar. Impact of national watershed development programme for rainfed areas among triable farmers- A study of in Bastar district (Chharrisgarh). Unpublished Thesis, PhD. G. B. Pant University Agriculture and Technology, Pantnagar, Uttarakhand, 2003.
11. Singh S, Tewari A, Ratan RPS. Constraints perceived by tribal farmers in adoption of improved production technology of rapeseed-mustard in Ranchi district. Journal Kirishi Vigyan. 2019;7(2):46-50.
12. Swetha M, Rani VS, Rao S, Devi KBS. A study on extent of use of drip irrigation system by sugarcane farmers in Telangana state. International Journal of Current Microbiology and Applied Sciences. 2017;6(10):1643-1647.
13. Ulemale DH, Kanse SA, Shelake PN. Study on knowledge and adoption of recommended package or practices of drip irrigation. Journal of Extension Education. 2003;4(3):734-742pp.
14. Verma HL, Sharaa SK. Constraints faced by the farmers in adoption of drip irrigation system in Bikaner district of Rajasthan. Agriculture Update. 2017;12(4):643-648.