

A Performance Evaluation of KVK with Special Reference to Adoption of Micro Irrigation (One drop more crop) among the Farmers of Barwani District, Madhya Pradesh

S.K. Badodiya^{1*}, D.K. Tiwari², D.K. Jain³ and P. Maratha⁴

¹Principal Scientist, ²PA, ³Scientist and ⁴AFM

RVSKVV, KVK Barwani (M.P.) and Kota (Raj.)

*Corresponding Author E-mail: sbadodiya@gmail.com

Received: 15.07.2020 | Revised: 27.08.2020 | Accepted: 6.09.2020

ABSTRACT

Water is as crucial for crops and vegetation as it is for humans and animals. Micro Irrigation is the most efficient water and nutrient delivery system for growing crops. The technology transfer through training, demonstration and extension activities has been viewed as most important critical factors for increasing agriculture production. The study was conducted in Barwani district of West Nimar region Madhya Pradesh due to its having maximum number of farmers of KVK using drip irrigation. In this study, the total sample was consisted of 120 respondents for the study. KVK is playing most important role in dissemination of technology. Main advantages perceived the respondents, were water and labor saving in guiding irrigation. Out of the total 120 untrained farmers, Majority 51.67 per cent respondents had medium adoption of drip irrigation technology followed by 40.83 percent of the farmers had high adoption of drip irrigation. Education and knowledge was found very important factor and it had highly significant with adoption of drip irrigation. High cost of inputs was the major constraints reported by 78.33 per cent farmers.

Keywords: Performance Analysis, Adoption, Perception, Micro Irrigation, Drip Irrigation and Krishi Vigyan Kendra.

INTRODUCTION

Rise in demand and development pressure changing the characteristics of water in India. Water is the driving force of all nature. Water covers about 71% of the earth's surface but only 3% of the earth's water is fresh. India constitutes 16 per cent of the world's population, but the country has only four per

cent of the world's freshwater resources. With the changing weather patterns and recurring droughts, India is water stressed. Conserving water means using our water supply wisely and be responsible. As every individual depends on water for livelihood, we must learn how to keep our limited supply of water pure and away from pollution.

Cite this article: Badodiya, S. K., Tiwari, D. K., Jain, D. K., & Maratha, P. (2020). A Performance Evaluation of KVK with Special Reference to Adoption of Micro Irrigation (One drop more crop) among the Farmers of Barwani District, Madhya Pradesh, *Ind. J. Pure App. Biosci.* 8(5), 565-572. doi: <http://dx.doi.org/10.18782/2582-2845.8850>

Micro irrigation's popularity may continue to grow as its benefits become more evident. Increased education and awareness, the availability of more technologically-advanced products and word of mouth exposure are all keys to heightening landscape drip irrigation's role as a significant water-conserving irrigation method. Drip irrigation is known to be the most efficient irrigation methods with 95-100% water use efficiency. This is compared to sprinkler systems that have 80-85% water use efficiency or flood and furrow that are 60-70% efficient. Efficiency is related to the effectiveness of the system on crop performance and eventually on yield and profitability of the farmer.

India has the second largest net irrigated area in the world, after China. The irrigation efficiency under canal irrigation is not more than 40% and for ground water schemes, it is 69%. The net irrigated area in the country is 53.5 Mha, which is about 38% of the total sown area. Although considerable area has been brought under irrigation since independence; there is much scope for its expansion in the future. Irrigation water for agriculture finds competition from domestic use, industrial and hydroelectric projects. At present, the efficiency of the irrigation systems adopted is less than 30%. As such as 50% of the water release at the project head is lost in transmission of the canal outlet. There is immense scope for conservation, distribution and on farm utilization of water and attaining higher water use efficiency through micro irrigation system, yield can be maximized significantly with a limited amount of water. Modern irrigation techniques like sprinkler and drip should be promoted where water is scarce and the topographic and soil condition do not permit conventional methods of irrigation.

Madhya Pradesh is one of the state in India where rainfed farming accounts the maximum cultivated area. The rainfed area needs proper and regular management of irrigation water particularly to save as

wastage from conventional type of irrigation. Micro-irrigation (MI) is proved an efficient method in saving water and increasing water use efficiency as compared to the conventional surface method of irrigation, where water use efficiency is only about 35-40 percent.

The Barwani district is known as for their peculiar character of black soil. The main crops of this area i.e. cotton and chilly, as well as vegetables & fruits also but cotton and chili are the main source of income to the farmers. The annual average rainfall rate of last two years is 746 mm hence water scarcity and sources of irrigation are not sufficient for the cultivation of crops influentially the farmers are to be suffered to this problem.

In recent years, The Krishi Vigyan Kendra and other Govt. Institutes are continuously making efforts to create awareness among the farmers about scientific cultivation and adoption of drip irrigation. Krishi Vigyan Kendra is playing major role for promoting the micro irrigation technology through Training programme, Exhibition, Kisan Mela, Sangosthi and other programme for dissemination of information about conservation of water and environmentally safe condition. The success of any programmes depends greatly on the perception of the trainees towards it. Hence it is worthwhile to assess the impact of drip irrigation in term of trainees' perception so that the farmers may adopt these technologies and enhance their production and productivity. The present study was under taken with the following objectives:

- To study the socio-personal profile of the farmers.
- To study the Perception of the farmers about advantages of drip irrigation.
- To measure the adoption level of drip irrigation system among the farmers.
- To Study the impact of KVK intervention about micro irrigation.
- To explore the relationship between socio-personal profile of the farmers

with their adoption of drip irrigation.

- To find out the problems and prospects of drip irrigation system in view of farmers.

MATERIALS AND METHODS

In order to fulfill these objectives, the study was conducted during 2020 in purposively selected Thikari, Barwani and Rajpur blocks of Barwani district of West Nimar region M.P, due to maximum activities and programme were organized by KVK on micro irrigation and these having maximum number of farmers who adopted drip irrigation in different crops. A list of villages where activities/programmes on drip irrigation technology were conducted by KVK was prepared and out of which 12 villages (4 from each block) were selected randomly. A village wise list of farmers, who are trained/awarded about drip irrigation technology by Krishi Vigyan Kendra was prepared and from each village ten farmers were selected by using simple random sampling method. Thus, the total sample was consisted of 120 respondents for the study. The data were collected with the help of pre-tested interview schedule. The data thus collected was tabulated and presented in the form of tables and graphs as per necessity. Keeping in view the objectives of the study and to draw logical results mean, percentage, and correlation tests was applied where they were required.

RESULTS AND DISCUSSION

A. Socio-personnel profile of the respondents-

It revealed from the present study that the higher percentage of respondents were found middle age group (45.83 %), medium level of education (40.83%), most of the respondents belong to general caste (35.83%), they have medium size of land holdings (39.17%), high annual income group (37.50%), medium source of irrigation (39.17%), medium area irrigated under drip irrigation system (40.83),

medium maintenance of the system (36.67%), medium level of attitude (37.50%), medium effect of DIS on production (45.83%) and medium information seeking behavior (41.67%) respectively. Out of the total respondents, most of the respondents 48.34 percent had medium level of knowledge followed by 45.83 percent respondents had high level of knowledge and 05.83 percent had low level of knowledge regarding drip irrigation system respectively.

The above facts lead to show that general profile of farmers in study area. Morya et al. (2020), Madhava and Surendran (2016) were found almost similar findings under socio personal profile of farmers.

B. Perception of the farmers about advantages of drip irrigation technology -

The advantages were perceived by the respondents after laying drip irrigation and they have more than two years of exposure in drip irrigation. Main advantages perceived the respondents, were water and labor saving in guiding irrigation. Labor saving was ranked first among the advantages of drip irrigation. The district experiences a huge shortage in labor force for agricultural operations due to industrialization. So, the respondents' perceived labor saving was the main advantage and it reduced the drudgery of the agricultural labors as well as labor cost. Water saving is also prime among the advantages of drip irrigation. All the respondents felt that, they experienced around 30-40 per cent water saving by adopting drip irrigation.

Much emphasis is given on the yield increase compared to conventional irrigation system and the respondents also had a similar perception. Majority 93.33 percent of respondents accepted yield increase due to the adoption of drip irrigation. The respondents (76.67%) felt that application of fertilizers through drip irrigation was very easy and economical though they did not realize it prior to adoption.

Table 2: Perception of the respondents regarding advantages of drip irrigation technology-

SN	Particulars	frequency	Percent	Rank
1	Enormous water saving	120	100.00	I
2	Efficient use of fertilizer	92	76.67	III
3	Higher yield than normal irrigation	112	93.33	II
4	Reduction of labor cost	120	100.00	I
5	Less evaporation losses of water	79	65.83	V
6	Reduce weeds	84	70.00	IV

Limited wetting of soil through drip irrigation has minimized weed growth. Also, reduced hand weeding resulted in labor saving and effective utilization of water and nutrients by sugarcane crop by avoiding weed compaction. Nearly 70.00 per cent of the respondents perceived that there was reduction in weed growth compared to conventional irrigation methods and followed by 65.83 percent respondents reported less losses of water through evaporation. Almost similar findings were reported by Rajula et al. (2021).

C. Adoption of drip irrigation technology among the farmers-

Drip irrigation system is water saving device and constantly gaining momentum and contributing significantly towards the upliftment of agriculture with limited irrigation water availability. Recognizing the importance of drip irrigation system in farm economy and their contribution to protect from wastage of water, it is necessary to motivate the respondents to adopt drip irrigation system as well as maximum possibilities.

Due to economic and safety point of view, the great emphasis is being paid by both the scientists and extension workers to boost up agriculture production with the use of irrigation particularly with the use of drip irrigation system because there is scarcity of irrigation water. The gain from drip irrigation system is possible only when the respondents adopt this technology as recommended as such. The adoption level of drip irrigation

system by selected respondents is presented in table 3.

The data presented in table 3 indicates that most of the respondents 51.67 percent had medium level of adoption regarding drip irrigation system followed by 40.83 percent had high level of adoption and 07.50 percent had low level respectively.

Thus, it may be concluded that higher number of the respondents had medium adoption level of drip irrigation system in study area followed by high and low. Rajula et al. (2021), Mandlik et al. (2018) and Arumai et al. (2013) also revealed that majority of the respondents found in medium category of adoption.

D. Impact of KVK' intervention about micro irrigation-

After Intervention of KVK, area of major crop is increasing with micro irrigation in Barwani district. Krishi Vigyan Kendra and other Govt. institute are playing major role for promoting the micro irrigation technology through Training programme, Exhibition, Kisan Mela, Sangosthi and other programme. At present Banana, papaya and pomegranate are cultivated in 1597 ha, 399.5ha and 435 ha. under drip irrigation. In vegetables like tomato in 1870 ha, okra in 12665 ha, sponge gourd in 568 ha, bitter gourd in 547 ha and cucumber in 712 ha area are cultivated with drip irrigation. More than 50-60 percent area of major crop like cotton, maize and chickpea are also covered with drip irrigation.

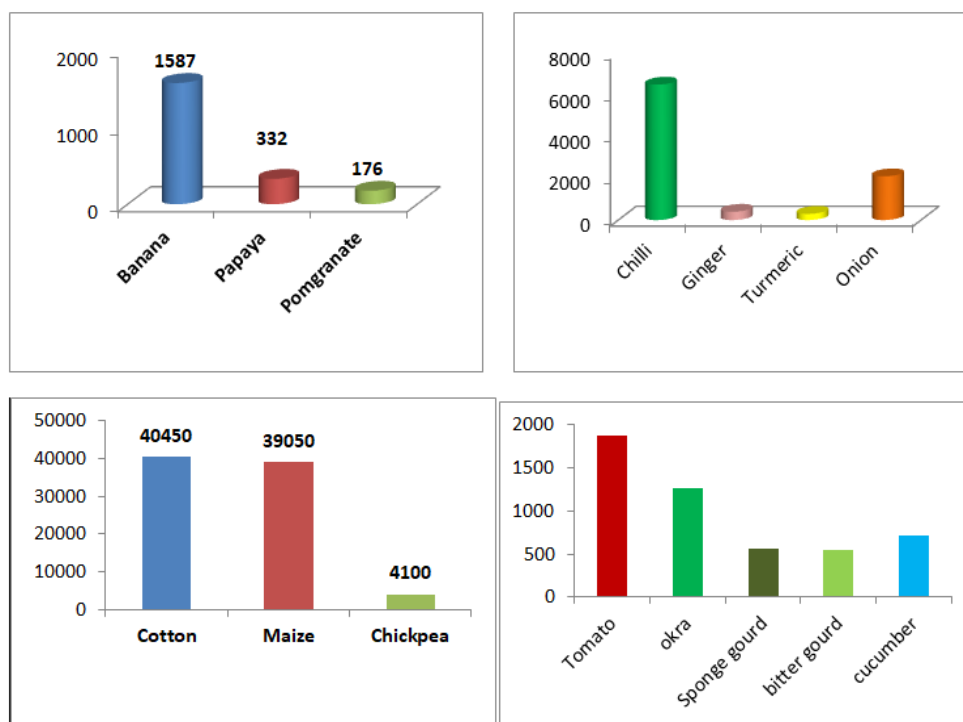


Fig. 1

E. Relationship between personal characteristics of farmers with adoption of drip irrigation-

It is evident from the Table-4 that out of nine independent attributes of trained farmers i.e. education, social participation, size of land holding, maintenance of system, Attitude towards DIS, and knowledge about drip irrigation were found significant relationship with adoption of drip irrigation at 1% level of significance while annual income, irrigation potential, source of information, effect of DIS on production and information seeking behavior were found significant relation with adoption of drip irrigation technology at 5% level of significance and only one attributes found non significant i.e. age. Morya et al. (2020) was also found that similar line of findings.

It is revealed that in case of trained farmers, out of nine independent attributes, only age and cosmopolitaness were found no significant relationship with adoption of drip irrigation technology and rest of the attributes were found in significant relationship with adoption of drip irrigation in different crop production.

E. Constraints experienced by the farmers-

Multiple responses were taken to ascertain the constraints faced by farmers. Various constraints are presented in Table-5 Maximum number of respondents were reported that high cost of inputs, 78.33 per cent. In the next order, non availability of labor was accounted by 73.33 per cent farmers. High wages of labor was also serious constraint which was faced by 71.67 per cent growers.

Table 1: Distribution of respondents according to their Socio-personal profile- (N=120)

S.N.	Attributes	Categories	No. of respondents	Percentage
1	Age	Young	32	26.67
		Middle	55	45.83
		Old	33	27.50
2	Level of Education	Functional literate	38	31.67
		Medium education	49	40.83
		High education	33	27.50
3	Caste	SC/ST	37	30.83

		Other backward	40	33.33
		General	43	35.83
4	Size of land Holding	Small	33	27.50
		Medium	47	39.17
		Large	40	33.33
5	Annual Income	Low	34	28.33
		Medium	41	34.17
		High	45	37.50
6	Source of Irrigation	Low	36	30.00
		Medium	47	39.17
		High	37	30.83
7	Area irrigated under DIS	Small	34	28.33
		Medium	49	40.83
		Large	37	30.83
8	Maintenance of the system	Low	33	27.50
		Medium	44	36.67
		High	43	35.83
9	Attitude towards DIS	Low	34	28.33
		Medium	45	37.50
		High	41	34.17
10	Effect of DIS on production	Low	35	29.17
		Medium	53	45.83
		High	32	26.67
11	Information seeking behavior	Low	34	28.33
		Medium	50	41.67
		High	36	30.00
12	Knowledge about drip irrigation	Low	07	05.83
		Medium	58	48.34
		High	55	45.83

Table 3: Distribution of respondents according to their level of adoption of drip irrigation

S.N.	Category	No. of respondents	Percentage
1.	Low level of adoption	09	07.50
2.	Medium level of adoption	62	51.67
3.	High level of adoption	49	40.83
Total		120	100.00

Table 4: Relationships between attributes of with their level of adoption of drip irrigation-

S. N.	Attributes	Correlation coefficient 'r'
1	Age	0.040 ^{NS}
2		0.521**
3	icipation	0.362**
4	l holding	0.399**
5	ome	0.239*
6	Irrigation potential	0.264*
7	nformation	0.294*
8	Maintenance of the system	0.347**

9	Attitude towards DIS	0.388**
10	Effect of DIS on production	0.251*
11	Information seeking behavior	0.272*
12	Knowledge about drip irrigation	0.589**

** Significant at 1% level of probability

* Significant at 5 % level of probability

Table 5: Constraints faced by the farmers

SN	Particulars	Frequency	Percentage	Rank
1	Timely unavailability of inputs	37	30.83	VI
2	High cost of inputs	94	78.33	I
3	non availability of labor	88	73.33	II
4	high wages of labor	86	71.67	III
5	Abnormal weather conditions	60	50.00	IV
6	High weed infestation	35	29.16	VII
7	Low price of produce	52	43.33	V

In the next order, abnormal weather condition was one of the major problems which were articulated by 50.00 per cent farmers. Another constraint was low price for grain was expressed by 43.33 per cent farmers they need minimum support price for output. Another constraint was high weed infestation which was expressed by 29.16 per cent and 30.83 per cent farmers were facing constraint of timely unavailability of inputs. The findings of Batchelor et al. (1996) and Rajula et al. (2021) were in the same line of the present finding.

CONCLUSION

KVK is playing most important role in dissemination of technology. Farmers are very happy to prefer and using drip irrigation in cultivation of vegetables, spices fruit crops as well as other major crops of the district. Main advantages perceived the respondents, were water and labor saving in guiding irrigation. Out of the total 120 untrained farmers, Majority 51.67 per cent respondents had medium adoption of drip irrigation technology followed by 40.83 percent of the farmers had high adoption of drip irrigation. Education and knowledge was found very important factor and it had highly significant with adoption of drip irrigation. High cost of inputs was the major constraints reported by 78.33 per cent farmers. As evinced in this study, drip irrigation is an important viable technology for

water conservation, labor saving and to overcome water stress during drought situations.

Acknowledgements

The author would like to acknowledge to all of the staff of the RVSKVV, KVK Barwani (M.P.).

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Conflict of Interest

The author(s) declares no conflict of interest.

Author Contribution

All authors contributed equally to establishing the topic of the research and design experiment.

REFERENCES

- Arumai Ruban, J., Balakrishnan, C., Santhoshkumar, S., & Jagan, G. (2020). Study of Smart Farming Techniques in Drip Irrigation using IoT. *International Journal of Advanced Science and Technology*. 29(2), 4595-4613.
- Amrutrao, M. J., Choudhary, H., Maurya, A., & Singh, V. (2018). Drip Irrigation System in Cotton Cultivation: One Step Enroute Intended for Sustainable Agriculture. *Indian Journal of*

- Economics and Development*. 14(1a), 52-58.
- Batchelor, C., Lovell, C., & Murata, M. (1996). Simple micro irrigation techniques for improving irrigation efficiency on vegetable gardens. *Agricultural Water Management*. 32, 37-48.
- Knowledge and Adoption of Maize Production Technology in Aurangabad District of Marathwada Region of Maharashtra LOMT
- Morya, J., Rai, D. P., & Badodiya, S. K. (2020). An Analytical Study on Management of Eco-Friendly Practices of Vegetable Crops among the Tribal farmers of Madhya Pradesh.
- Int. J. Curr. Microbiol. App. Sci.* 9(04), 3036-3046.
- Madhava Chandran, K., & Surendran, U. (2016). Study on factors influencing the adoption of drip irrigation by farmers in humid tropical Kerala, India. *International Journal of Plant Production* 10(3), 347-364.
- Rajula Shanthi, T., Manivel, K., & Saravanan, L. (2021). Adoption of Drip Irrigation in Sugarcane – A Performance Analysis. *Indian Res. J. Ext. Edu.* 21(1), 1-6.