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Original Research Article

Socio Economic Impact of Adoption of Drip Irrigation System on Drip Owners of Aravalli District

Mahammad Shafi Rupanagudi Shaik[1]* and J.J. Mistry[2]

[1]Department of Extension Education, C. P. Collage of Agriculture, S. D. A. U., Sardarkrushinagar -385506, Gujarat, India
[2]Directorate of Extension Education, S. D. A. U., Sardarkrushinagar -385506, Gujarat, India
**Corresponding author*

A B S T R A C T

The study was conducted to explore the socio economic impact of adoption of drip irrigation system on drip owners of Aravalli district. Data were collected through personal interview during the year 2017 from purposively selected of Aravalli districts of Gujarat with the sample size of 150 respondents. This indicated that majority of the drip owners were having medium level of socio economic impact, followed by high and low level of socio economic impact, respectively.

Keywords

Socio economic impact, Drip owners and drip irrigation system (DIS)

Introduction

Agriculture forms the main base for Indian socio economic development. Its development towards modernization is observed since couple of decades. However, the agricultural production and productivity are yet to be boosted to meet the need in respect to the crop commodities *viz.*, oilseeds, pulses, fibers, fruits and vegetables. The requirement can only be met by maximizing productivity of unit land in unit time through efficient and judicious use of technology and inputs, particularly the irrigation water. More than 70.00 per cent of the cropped area in the country depends on the vagaries of monsoon. For increasing the agricultural production, the importance of irrigation is fully realized, but the proper use of water is seldom practiced in our country. World Bank predicted that by the year 2035, three million people will live in the tough conditions because of water shortage (World Bank, 2009). Generally, farmers look for a method of irrigation, which is most efficient with less water, labour, fertilizer and power requirements. Among the irrigation methods, the drip irrigation system, is the advanced method of irrigation to overcome the various problems

of water losses and other problems such as labour, money and water management. This method is rapidly gaining importance in the area where water is scarce as well as high value crops are grown. Drip irrigation is an effective and efficient method of providing water directly to the root zone of the plant. Several results of the research established that about 35 to 65 per cent of the available water could be saved by adopting drip irrigation (Reilly, 2004).

Materials and Methods

The study was conducted in Aravalli district of Gujarat state in 2017. Among the six talukas of Aravalli district, three talukas, namely Modasa, Dhansura and Bayad were randomly selected. Five villages were selected from each selected talukas on the basis of maximum number of drip owners. Thus, total 15 villages were selected for the study. Ten respondents from each village were selected by using random sampling techniques making a sample size of 150 respondents. The data were collected by personal interview from the selected drip owners with the help of carefully constructed structured and pre-tested interview schedule. The socio economic changes were measured in terms of 11 aspects viz., change in self sufficiency, change in social status, saving in water, saving in fertilizer cost, saving in plant protection cost, saving in weed control expenses, saving in labour utilization, saving in energy cost, increase in crop production, early maturity of crop and improving quality of produce. The before and after approach was followed for getting the information about the aspects selected for study. The scoring was followed for each aspect. The categorization of drip owners were made through obituary method by dividing the number of categories in context to minimum and maximum range of observation. In order to obtain overall socio economic impact, the score obtained by each aspect by an individual was summed up. The score of each aspect was added to get the socio economic impact score.

Results and Discussion

The information regarding change in self-sufficiency after adoption of DIS is presented in below Table 1.

Majority of drip owners (82.67 per cent) were found in range of 7 - 8 self sufficiency followed by 15.33 per cent of drip owners between 5 to 6 range and 2.00 per cent between 3-4 range.

The information regarding change in social status after adoption of DIS is presented in below Table 2.

The data in Table 2 revealed that by adopting the drip irrigation system, the 26.67 per cent of respondents had their social status between 0 - 2 range, followed by 25.33 per cent of drip owners between 5-6 range and 18.00 per cent of drip owners between 3-4 range. While 16.67 per cent and 13.33 per cent of drip owners had their social status between 7 - 8 range and between 9 - 10 range, respectively.

The information regarding saving of water before and after adoption of DIS is presented in below Table 3.

It is observed from the Table 3 that before adoption of drip irrigation, the 49.33 per cent of drip owners used 51 to 75 per cent of irrigation water followed by 31.33 per cent of drip owners used above 76 per cent. The 18.67 per cent of drip owners used irrigation water up to 26 to 50 per cent and 0.67 per cent of the drip owners used irrigation water up to 25 per cent. After adoption of drip

irrigation, the 56.00 per cent of drip owners used 26 to 50 per cent of irrigation water followed by 34.67 per cent of drip owners used irrigation water up to 25 per cent. The 8.67 per cent of the drip owners used irrigation water between the range of 51 to 75 per cent and 0.67 per cent of the drip owners used irrigation water above75 per cent.

The information regarding saving in fertiliser cost before and after adoption of DIS is presented in below Table 4.

The data in Table 4 indicated that before adoption of drip irrigation system, the 84.67 per cent of drip owners spent money more than ₹ 10001 for purchasing fertilisers followed by 15.33 per cent of drip owners spent money between ₹ 5001 to ₹ 10000. After adoption of drip irrigation system, the 56.00 per cent of drip owners spent money between ₹ 1001 to ₹ 5000 in purchasing fertilisers followed by 34.67 per cent of drip owners spent money between ₹ 1 to ₹ 1000. While 8.67 per cent of drip owners spent money in ₹ 5001 to ₹ 10000 and 0.67 per cent of drip owners spent more than Rs. 10001 for purchasing fertilisers.

The information regarding saving in plant protection cost before and after adoption of DIS is presented in below Table 5.

It is evident from the Table 5 that before adoption of drip irrigation system, the 62.00 per cent of drip owners spent money in plant protection chemicals between ₹ 1001 to ₹ 5000, followed by 35.33 per cent of drip owners spent money between ₹ 5001 to ₹ 10000. While 2.67 per cent of drip owners spent money more than ₹ 10001 in plant protection chemicals. After adoption of drip irrigation system, the 85.33 per cent of drip owners spent money in plant protection chemicals in between the range of ₹ 1001 to ₹ 5000 followed by 14.67 per cent of drip owners spent money between ₹ 5001 to ₹ 10000 in plant protection chemicals.

The information regarding saving in weed control expenses before and after adoption of DIS is presented in below Table 6.

It is evident from the Table 6 that before adoption of drip irrigation system, the 76.67 per cent of drip owners spent money in weed control chemicals in between ₹ 1001 to ₹ 5000 followed by 23.33 percent of drip owners spent money in between ₹ 5001 to ₹ 10000 for weed control chemicals. After adoption of drip irrigation system, the 96.00 per cent of drip owners spent money in weed control chemicals in between the range of ₹ 1001 to ₹ 5000 followed by 2.67 percent of drip owners spent money between ₹ 5001 to ₹ 10000. While 1.33 per cent of drip owners spent money in between ₹ 1to ₹ 1000 in weed control chemicals.

The information regarding saving in labour utilisation before and after adoption of DIS is presented in below Table 7.

The data in Table 7 revealed that before adoption of drip irrigation system, the 48.00 per cent of drip owners spent money for labours between ₹ 5001 to ₹ 10000 followed by 52.00 per cent of drip owners spent money in between range of ₹ 1001 to ₹ 5000 for labour purpose. After adoption of drip irrigation system, the 94.67 per cent of drip owners spent money for labourers in between ₹ 1001 to ₹ 5000 followed by 4.67 per cent of drip owners spent money between ₹ 5001 to ₹ 10000. While 0.67 per cent of drip owners spent between ₹ 1 to ₹ 1000 in labour cost.

The information regarding saving in energy cost before and after adoption of DIS is presented in below Table 8.

The data in Table 8 shows that before adoption of drip irrigation system, the 81.33 per cent of drip owners spent money for electricity between ₹ 1001 to ₹ 5000 followed by 18.67 per cent of drip owners spent money in between ₹ 5001 to ₹ 10000 for .electricity charges. After adoption of drip irrigation system, the 98.67 per cent of drip owners spent money for electricity charges in between ₹ 1001 to ₹ 5000 followed by 1.33 per cent of drip owners spent money between ₹ 1to ₹ 1000.

The information regarding per cent increase in crop production after adoption of DIS is presented in below Table 9.

It is obvious from the data indicated in Table 9 that majority of drip owners (73.33 per cent) increased crop production between 26 to 50 per cent followed by 26.67 per cent of drip owners increased their crop production up to 25 per cent.

The information regarding quality of produce as compared to conventional irrigated produce after adoption of DIS is presented in below Table 10.

It is apparent from the Table 10 that majority (86.00 per cent) of the drip owners increased their quality of produce after adoption of drip irrigation system but 14.00 per cent of drip owners responded that the quality of their production did not improved as compared to conventional irrigation system.

The information regarding early maturity of the crop after adoption of DIS is presented in below Table 11.

It is evident from the Table 11 that majority (64.00 per cent) of the drip owners got up to 15 days maturity of the crop and 36.00 per cent of the drip owners got more than 15 days maturity after adoption of drip irrigation system.

The information regarding the overall impact of DIS is presented in below Table 12.

Change in self-sufficiency after adoption of DIS			
Sr. No.	**Category**	**Frequency**	**Per cent**
1	0 - 2 range	0	0.00
2	3 - 4 range	3	2.00
3	5 - 6 range	23	15.33
4	7 - 8 range	124	82.67
Total		**150**	**100.00**

Change in social status after adoption of DIS			
Sr. No.	**Category**	**Frequency**	**Per cent**
1	0 - 2 range	40	26.67
2	3 - 4 range	27	18.00
3	5 - 6 range	38	25.33
4	7 - 8 range	25	16.67
5	9 - 10 range	20	13.33
Total		**150**	**100.00**

Saving of water (Per cent)	Before Adoption		After Adoption	
	Frequency	Per cent	Frequency	Per cent
Up to 25 per cent	1	0.67	52	34.67
26 to 50 per cent	28	18.67	84	56.00
51 to 75 per cent	74	49.33	13	8.67
Above 76 per cent	47	31.33	1	0.67
Total	**150**	**100.00**	**150**	**100.00**

Saving in fertiliser cost (₹)	Before Adoption		After Adoption	
	Frequency	Per cent	Frequency	Per cent
₹ 1 to ₹ 1000	0	0	52	34.67
₹ 1001 to ₹ 5000	0	0.00	84	56.00
₹ 5001 to ₹ 10000	23	15.33	13	8.67
More than ₹ 10001	127	84.67	1	0.67
Total	**150**	**100.00**	**150**	**100.00**

Saving in plant protection cost (₹)	Before Adoption		After Adoption	
	Frequency	Per cent	Frequency	Per cent
₹ 1to ₹ 1000	0	0.00	0.00	0.00
₹ 1001 to ₹ 5000	93	62.00	128.00	85.33
₹ 5001 to ₹ 10000	53	35.33	22.00	14.67
More than ₹ 10001	4	2.67	0.00	0.00
Total	**150**	**100.00**	**150**	**100.00**

Saving in weed control expenses (₹)	Before Adoption		After Adoption	
	Frequency	Per cent	Frequency	Per cent
₹ 1 to ₹ 1000	0	0.00	2	1.33
₹ 1001 to ₹ 5000	115	76.67	144	96.00
₹ 5001 to ₹ 10000	35	23.33	4	2.67
Total	**150**	**100.00**	**150**	**100.00**

Saving in labour utilisation (₹)	Before Adoption		After Adoption	
	Frequency	Per cent	Frequency	Per cent
₹ 1to ₹ 1000	0	0.00	1	0.67
₹ 1001 to ₹ 5000	78	52.00	142	94.67
₹ 5001 to ₹ 10000	72	48.00	7	4.67
Total	**150**	**100.00**	**150**	**100.00**

Saving in energy cost (₹)	Before Adoption		After Adoption	
	Frequency	Per cent	Frequency	Per cent
₹ 1 to ₹1000	0	0.00	2	1.33
₹ 1001 to ₹ 5000	122	81.33	148	98.67
₹ 5001 to ₹ 10000	28	18.67	0	0.00
Total	**150**	**100.00**	**150**	**100.00**

Sr. No.	Per cent increase in crop production	Frequency	Per cent
1	Up to 25 per cent	40	26.67
2	26 to 50 per cent	110	73.33
	Total	**150**	**100.00**

Quality of produce as compared to conventional irrigated produce		
	Frequency	**Per cent**
Yes	129	86.00
No	21	14.00
Total	**150**	**100.00**

Early maturity of the crop		
Up to 15 days	96	64.00
More than 15 days	54	36.00
Total	**150**	**100.00**

Sr. No.	Impact of DIS	Frequency	Per cent
1	Low (Up to 20.99 score)	30	20.00
2	Medium (Between 20.99 -25.30 score)	86	57.33
3	High (Above 25.30 score)	34	22.67
	Total	**150**	**100.00**
$\bar{X}$ = 20.63			**S. D. = 3.20**

The data in Table 12 indicated that majority of the drip owners (57.33 per cent) were having medium level of socio economic impact, followed by 22.67 per cent and 20.00 per cent of them had high and low level of socio economic impact, respectively.

It can be concluded that majority of drip owners were found in range of 7 - 8 self sufficiency while respondents had their social status between 0 - 2 range. It is observed that before adoption of drip irrigation, majority of drip owners used 51 to 75 per cent of irrigation water but after adoption of drip irrigation, most of drip owners used 26 to 50 per cent of irrigation water. The results indicated that before adoption of drip irrigation system, majority of drip owners spent money more than ₹ 10001 for purchasing fertilisers. But after adoption of drip irrigation system, most of drip owners spent money between ₹ 1001 to ₹ 5000 in purchasing fertilisers. It is evident that before adoption of drip irrigation system, the most of drip owners spent money in plant protection chemicals between ₹ 1001 to ₹ 5000. But after adoption of drip irrigation system, most of drip owners spent money in plant protection chemicals in between the range of ₹ 1001 to ₹ 5000. It is revealed that before adoption of drip irrigation system, majority of drip owners spent money for labours between ₹ 5001 to ₹ 10000. But after adoption of drip irrigation system, most of drip owners spent money for labourers in between ₹ 1001 to ₹ 5000. It is evident that before adoption of drip irrigation system, majority of the drip owners spent money for electricity between

₹ 1001 to ₹ 5000. After adoption of drip irrigation system, most of drip owners spent money for electricity charges in between ₹ 1001 to ₹ 5000. It is obvious from the data that majority of drip owners increased crop production between 26 to 50 per cent. It is apparent that majority (86.00 per cent) of the drip owners increased their quality of produce after adoption of drip irrigation system. It is evident that majority of the drip owners got up to 15 days maturity of the crop. Overall majority of the drip owners had medium level of socio economic impact.

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