

RESEARCH NOTE

Socio Economic Impact of Drip Irrigation System on Drip Owners

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ABSTRACT

The study was conducted to study the socio-economic impact of drip irrigation system on drip owners of Aravali district. The results indicated that after adoption of drip irrigation system drip owners were found that there is increase in self sufficiency and social status. It is also observed that there is saving in water due to adoption of drip irrigation, savings in purchasing fertilisers, plant protection chemicals, weed control expenses, labourers charges, electricity charges. It is obvious from the data that majority of drip owners increased crop production, quality of produce and early maturity of the crop after adoption of drip irrigation system. Overall majority of the drip owners had medium level of socio economic impact.

Key words: *Socio economic impact; Drip owners; Drip irrigation system (DIS);*

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 revealed that about 35 to 65 per cent of the available water could be saved by adopting drip irrigation (Reilly, 2004). This study will be useful for research workers to evaluate the various aspects of drip irrigation system and overall impact of drip irrigation system. Keeping in view of the above concept, a study was carried with the following objectives:

- i. To study the socio economic impact on various aspects of drip owners in before and after adoption of drip irrigation system
- ii. To study the overall impact of drip irrigation system on socio economic status of the drip owners

METHODOLOGY

The study was conducted in Aravalli district of Gujarat state by using ex-post facto research design. Among the six talukas of Aravalli district, three talukas, namely Modasa, Dhansura and Bayad were randomly selected. Five villages were selected from each selected taluka 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 technique making a sample size of 150 respondents. The data were collected by personal interview from the selected drip owners with the help of well structured and pre-tested interview schedule. The socio economic impact was measured in terms of changes in various 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. The socio economic impact of before and after adoption and overall impact of drip irrigation system of each drip farmer was calculated using the formula given ahead.

$$\text{Categorization} = \frac{\text{Maximum Score}}{\text{No. of category}}$$

Based on the mean score obtained, frequency, percentage and the standard deviation (mean ± S.D), farmers were categorized as low, medium and high socio economic impact of drip owners.

RESULTS AND DISCUSSION

Social impact of DIS : Data from Table 1 revealed that majority of drip owners (100.00%) gained self sufficiency in fulfilling the basic needs followed by 96.00 per cent of drip owners increased in area under drip irrigation while 80.00 per cent of drip farmers maintaining the high standard of life and 63.33 per cent of drip farmers purchased new property/ land/ farm machinery.

Table 1. Gain in self-sufficiency after adoption of DIS

Category	No.	%
Fulfil your basic needs	150	100.00
Area under irrigation is increased	145	96.66
Maintain high standard of life	120	80.00
Purchased new property/ land/ farm machinery	95	63.33

The data in Table 2 revealed that by adopting the drip irrigation system, the 44.67 per cent of drip owners

had their high social status, followed by 38.66 per cent of drip owners had medium social status. While 16.67 per cent of drip owners had their low social status, respectively.

Table 2. Change in social status after adoption of DIS

Category	No.	%
High (6.67 - 10 range)	67	44.67
Medium (3.34 – 6.66 range)	58	38.66
Low (1-3.33 range)	25	16.67
Total	150	100.00

Agronomical impact of DIS: It is observed from the Table 3 that before adoption of drip irrigation, majority of 49.33 per cent of drip owners used 51 to 75 per cent of irrigation water. But After adoption of drip irrigation, the 56.00 per cent of drip owners used 26 to 50 per cent of irrigation water. So the majority of water utilization was decreased from 75 per cent to 50 per cent. Thus indicates that there is saving in water utilization.

Table 3. Saving of water before and after adoption of DIS

Water utilization (%)	Before		After	
	No.	%	No.	%
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

Table 4. Saving in fertiliser cost before and after adoption of DIS

Fertiliser utilization in cost (₹)	Before		After	
	No.	%	No.	%
₹ 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

The data in Table 4 indicated that before adoption of drip irrigation system, majority of the 84.67 per cent of drip owners spent money more than ₹10001 for purchasing fertilisers. After adoption of drip irrigation system, majority of the 56.00 per cent of drip owners spent money between ₹1001 to 5000 in purchasing fertilisers. This indicates that the expenditure spend on fertilizer was decreased from ₹10001 to 5000 thus indicates that there is saving in saving in fertilizer cost.

Table 5. Saving in plant protection cost before and after adoption of DIS

Plant protection expenditure (₹)	Before		After	
	No.	%	No.	%
₹1 to 1000	0	0.00	0	0.00
₹ 1001 to 5000	53	35.33	128	85.33
₹ 5001 to 10000	93	62.00	22	14.67
More than 10001	4	2.67	0	0.00
Total	150	100.00	150	100.00

It is evident from the Table 5 that before adoption of drip irrigation system, majority of the 62.00 per cent of drip owners spent money in plant protection chemicals between ₹5001 to 10000. After adoption of drip irrigation system, majority of the 85.33 per cent of drip owners spent money in plant protection chemicals in between the range of ₹1001 to 5000. This indicates that the expenditure spend on plant protection chemicals was slightly decreased from ₹10000 to 5000. This indicates the saving in plant protection chemicals.

Table 6. Saving in weed control expenses before and after adoption of DIS

Expenditure on weed control expenses (₹)	Before		After	
	No.	%	No.	%
₹ 1 to 1000	0	0.00	2	1.33
₹ 1001 to 5000	35	23.33	144	96.00
₹ 5001 to 10000	115	76.67	4	2.67
Total	150	100.00	150	100.00

It is evident from the Table 6 that before adoption of drip irrigation system, majority of the 76.67 per cent of drip owners spent money in weed control chemicals in between ₹5001 to 10000. After adoption of drip irrigation system, majority of the 96.00 per cent of drip owners spent money in weed control chemicals in between the range of ₹ 1001 to 5000. This signifies that weed control expenditures dropped from ₹10000 to 5000. This implies that there is saving in weed control expenses.

Table 7. Per cent increase in crop production after adoption of DIS

% increase in crop production	No.	%
Up to 25 per cent	40	26.67
26 to 50 per cent	110	73.33
Total	150	100.00

Table 7 indicated that majority of drip owners (73.33%) 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.

Table 8. Change in quality of produce after adoption of DIS

Change in quality of produce	No.	%
	Yes	129
No	21	14.00
Total	150	100.00

It is apparent from the Table 8 that majority (86%) of the drip owners expressed that quality of produce after adoption of drip irrigation system was improved after adoption of DIS but 14.00 per cent of drip owners responded that the quality of their production did not improved as compared to conventional irrigation system.

Table 9. Early maturity of the crop after adoption of DIS

Early maturity of the crop	No.	%
	Up to 15 days	96
More than 15 days	54	36.00
Total	150	100.00

It is evident from the Table 9 that majority (64%) of the drip owners got up to 15 days early maturity of the crop and 36.00 per cent of the drip owners got more than 15 days early maturity after adoption of drip irrigation system.

Economic impact of DIS: The data in Table 10 revealed that before adoption of drip irrigation system, majority of the 52.00 per cent of drip owners spent money for labours between ₹ 5001 to 10000. After adoption of drip irrigation system, the 94.67 per cent of drip owners spent money for labourers in between ₹ 1001 to 5000. This implies that expenses on labour utilization were decreased from ₹ 10000 to 5000. So there is a decrease in the cost of expenditure on labour and increased saving in labour utilization cost.

Table 10. Saving in labour utilisation before and after adoption of DIS

Expenditure in labour utilisation (₹)	Before		After	
	No.	%	No.	%
₹ 1 to 1000	0	0.00	1	0.67
₹1001 to 5000	72	48.00	142	94.67
₹5001 to 10000	78	52.00	7	4.67
Total	150	100.00	150	100.00

The data in Table 11 shows that there is increase in the respondents after adoption of drip irrigation system from 81.33 to 98.67 per cent who spent money for electricity between ₹1001 to 5000 and also not a single respondent spent money for electricity between

₹5001 to 10000. This implies that there is saving on expenditure towards electricity charges after adoption of drip irrigation system.

Table 11. Saving in energy cost before and after adoption of DIS

Saving in energy cost (₹)	Before		After	
	No.	%	No.	%
₹ 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

Table 12. Overall impact of DIS

Early maturity of the crop	No.	%
Overall Impact of DIS	No.	%
Low (Up to 20.99 score)	30	20.00
Medium (Between 20.99 -25.30 score)	86	57.33
High (Above 25.30 score)	34	22.67
Total	150	100.00
\bar{X} = 20.63	S. D. = 3.20	

Overall impact of drip irrigation system on drip owners: Considering the impact of social, economical, agronomical aspects, the overall impact of drip irrigation system was studied and respondents were grouped into three categories.

The data in Table 12 indicated that majority of the drip owners (57.33%) 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. The findings are in line with the findings of *Suthar (2010)*.

CONCLUSION

It can be concluded that impact of adoption of drip irrigation system was observed in terms of increase in water saving from 26 to 50 per cent, saving in expenditure on purchase of fertilizer, plant protection chemicals, saving in weed control expenses. There is saving in labour utilization as well as electricity charges between the range of ₹1001 to 5000. Also majority (86.00%) of drip owners improved their quality of produce and increased crop production by 26 to 50 per cent, achieved early maturity of crops up to 15 days after adoption of drip irrigation system. Study further concludes that drip owners gained self sufficiency in food and acquired good social status in society. Results of overall impact showed that majority of the drip owners had medium level of socio economic impact. Thus one can suggest that farmers should go for drip irrigation technology for judicious and efficient use of water for agriculture.

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