

Techno-Economic Consequences Implicit Through Adoption of Drip Irrigation System

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ABSTRACT

The present study was conducted in six talukas of Junagadh district to analyze the constraints faced by mango orchard growers in adoption of drip irrigation system. The data collected from the respondents by arranging personal interview with randomly selected 175 mango orchard growers of the twenty-four selected villages with the help of interview schedule. The results of the research revealed the most important economic constraints faced by mango orchard growers in adoption of drip irrigation. It is also reflected that the adoption of drip irrigation system had resulted in many changes. The system had contributed for a significant increase in area under fruit crops. Cropping intensity and cropping pattern had been changed in the farmers' fields with the inclusion of several fruit and commercial crops. Farm machinery / farm implements and household possession had also been increased and many farmers had diverted their cropped area to orchards. The savings and investment, standard of living and self-sufficiency of majority of respondents had been increased as a result of adoption of drip irrigation system.

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INTRODUCTION

Land and water are the two basic inputs for progress in agriculture and economic development of any country. Gujarat State has a relatively lower share in the overall availability of water in India.

Saurashtra region is considered as a dry farming area, where the availability of water for irrigation in wells is extremely scarce and irregular. Therefore, the farmers of this region have been attracted towards the modern method of irrigation and they have introduced drip irrigation system with the hope of making the judicious and scientific use of irrigation water at hand on farm lands and thereby overcoming the various problems such as labour, money and water management. Any technology

that is adopted needs to be assessed periodically to suggest the effective changes for subsequent functioning and this truly holds good with drip irrigation system as quite a few years have already been passed and probably this is the high time to examine the consequences of this system. Therefore, a study on techno economic consequences implicit through adoption of drip irrigation system was undertaken.

MATERIALS AND METHODS

In this study the resultant changes occurred among the mango orchard growers as a result of adoption of drip irrigation system in the form of techno-economic changes have been taken into account as consequences of drip irrigation

system. It is operationally defined as the resultant changes due to adoption of drip irrigation system in terms of techno-economic aspects that prospered among the mango orchard growers. The techno-economic change was measured in terms of ten aspects namely changes in land use, cropping intensity, cropping pattern, farm machinery / farm implements and household possession, savings and investment, food habits, clothing pattern, housing condition and change in self-sufficiency. Change taken place in a particular aspect during two points of time viz., before and after approach was followed for getting information about the aspects selected for the study. The scoring procedure followed for these aspects was as under :

Change in land use

Actual area increased in hectares under fruit crops be taken as change in land use. One score was assigned to each in case of increased land.

Change in cropping intensity

Actual increase in cropping intensity was taken as cropping intensity after deducting the cropping intensity from prior to adoption of DIS. Scoring was done based $\bar{x} \pm S. D.$

Change in cropping intensity

	Score
No change	0
Upto 15 per cent change	1
16 to 102 per cent change	2
Above 102 per cent change	3

Change in cropping pattern

Actual area increased in hectares under different field crops was taken as change in cropping after deducting the area from the area prior to adoption of DIS. One

score was assigned to each 0.50 ha of increased area.

Change in farm machinery/farm implements

Farm machinery/farm implements and equipment purchased by the mango orchard growers after adoption of DIS was taken as change in farm machinery/farm implements and equipment. Scoring was done on the basis of cost as given in Table-2.

Change in household items

Additional household items purchased by the mango orchard growers after adoption of DIS was taken as the change in household items. Scoring procedure was followed on the basis of household items as given in Table-2.

Change in savings and investment

Eight statements regarding change in savings and investment were included in the study. The score of 1 and 0 was assigned for 'yes' and 'no' answer, respectively. The score of such statement was added to obtain final score indicating change in savings and investment.

Change in food habits

The statements regarding change in food habits were prepared. The respondents were asked to give their reply to each statement in the form of 'yes' or 'no'. The score of 1 and 0 was assigned for yes and no answer to each statement, respectively. Thus, the summated score was obtained as total score for change in food habits in quantitative items.

Change in clothing pattern

Four statements pertaining to change in clothing pattern were prepared. The respondents were asked to reply each statement as yes or no. The score of 1 and 0 was assigned to yes and no answer to

each statement, respectively. In order to obtain total score for change in clothing pattern, the score of each statement was added up.

Change in housing condition

The statements about change in housing condition were prepared. The respondents were asked to give their response. The answer to each statement was yes or no and score was assigned 1 and 0 respectively. The score of each statement was summed up to obtain final score indicating change in housing condition.

RESULTS AND DISCUSSION

TABLE 1

Distribution of Mango orchard growers according to their level of Techno-economic consequences.

N = 175				
Sr. No.	Level of techno-economic consequences	Score range	Frequency	Per cent
1.	Low	Upto 38	23	13.14
2.	Medium	39 to 72	128	73.14
3.	High	Above 72	24	13.72

Mean = 54.989

SD = 17.267

The data presented in table - 1 indicate that majority of (73.14 per cent) of the mango orchard growers were found to have medium level of techno-economic consequences, whereas merely similar number (13.72 per cent and 13.14 per cent) of respondents were found to have high and low level of techno economic consequences, respectively.

Thus, it can be concluded that majority (73.14 per cent) of the mango orchard growers were found to have medium level of techno-economic consequences. The probable reason may be due to the fact that nearly two fifth of the adopters had covered only quarter to half of the mango orchards under drip method of irrigation rather than covering their entire orchards.

Change in self-sufficiency

Change in self-sufficiency was measured with the help of six statements and the responses of the mango orchard growers were obtained against each statement in terms of yes or no. The scoring procedure was 1 and 0 for yes and no response, respectively. An individual respondents scores on change in self-sufficiency were computed summing the scores obtained by him on six statements.

Further an effort had been made to know the techno economic consequences before and after adoption of drip irrigation system in few aspects.

Drip irrigation system has played a significant role in the context of techno-economic developments on mango orchard growers. Results of the farm level performance with mango orchards before and after adoption of the system are summarized in Table-2.

The data presented in table-2 reveal the fact that there was significant increase in the average area taken up under fruit crops plantation by reducing of growing field crops significantly. The probable reason may be that the farmers might have visualized about the success of the drip irrigation system in orchard crops than in other field crops.

So far as change in cropping intensity is concerned, the drip irrigation system had contributed for a significant increase in the average intensity of cropping system. The possible reason may be that there might have tremendous saving of water, which might be resulted in increase of total cropped area. It is also possible that the farmers might have diverted their areas to the orchard crops. Since in orchards, the plants as well as the rows are widely spaced, the farmers might have grown the crops in between the rows of the fruit

crops, which might have resulted in increase of total cropped area. It was also observed that there was significant change in cropping pattern. This change may be due to the diversion of field crops area to fruit crops and farmers might have used their cultivable wasteland or agricultural land for plantation of fruit crops. It is also possible that more area could be brought under irrigation by introducing drip irrigation system, especially for fruit and commercial crops.

TABLE 2

Aspect wise Techno-economic consequences implicit through Adoption of Drip Irrigation system.

Sr. No.	Particulars	Prior to adoption	After adoption of DIS	Mean difference	't' value
1.	Change in land use				
i)	Area under fruit crops (Mean area in ha)	1.910	3.093	1.183	**9.516
ii)	Area under field crops (Mean area in ha)	2.109	1.117	0.992	**9.066
2.	Change in cropping intensity (Mean intensity in per cent)	123.040	181.651	58.611	**17.727
3.	Change in farm machinery and farm implements (Mean score)	19.640	29.942	10.302	14.730
4.	Change in cropping pattern				
i)	Fruit crops (Mean area in ha)	1.910	3.093	1.183	**9.516
ii)	Field crops (Mean area in ha)	0.519	1.780	1.261	**13.698
5.	Change in household possession (Mean score)	18.020	29.642	11.622	**22.776

** Significant at 0.01 level of profitability.

The data further reveal that the average increase in farm machinery / farm implements and household possession score of mango orchard growers was significant after adoption of drip irrigation system. The probable reason may be that the adoption of drip irrigation system might be of a great advantage to the farmers in achieving agricultural production and

thereby approving their economic conditions, which might have resulted a raising the farm machinery / implements and household possession of the mango orchard growers.

It can be inferred that the drip irrigation system had contributed for a significant increase in area under fruit crops. Cropping intensity and cropping pattern had been

changed with the inclusion of several fruit and commercial crops. Farm machinery / farm implements and household possession had also been increased and many farmers had diverted their cropped area to orchards.

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