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AN ECONOMIC ANALYSIS OF VEGETABLES AND HORTICULTURAL CROPS UNDER MICRO IRRIGATION SCHEME IN HIMACHAL PRADESH

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ABSTRACT

The micro irrigation scheme has received considerable attention from policy makers, researchers, and economists etc. for its perceived ability to contribute significantly to groundwater resources development, agricultural productivity, economic growth, and environmental sustainability. In this paper, the impact of micro irrigation scheme has been studied on farming system in terms of production, productivity, cost and returns. At overall level Input-Output Ratio (over total variable cost) was worked out be 5.45, 5.65, 2.23, 5.40, 5.86, 2.84, 17.47, 16.38 and 38.78 for capsicum, tomatoes, brinjal, cauliflower, cabbage ,potatoes, mango, kinnow and pomegranate crops respectively. Returns over variable cost were found to be positive and more than one respectively for all crop, which reveals that farmers cultivating this crop were recovering variable cost as well as getting returns over variable cost incurred. The micro irrigation has been found to have a significant impact on resources saving, cost of cultivation, yield of crops and farm profitability. Hence, the policy should be focused on promotion of micro irrigation in those regions where scarcity of water and labour is alarming and where shift towards wider-spaced crops is taking place.

KEY WORDS: *Micro Irrigation, Sprinkler, Drip, Input, Output, Cost, Cultivation, Return.*

1. INTRODUCTION

Water is a resource that all living species need. Agriculture is an industry that uses a lot of water. Most of the time, this resource is not used efficiently and substantial amount of water are wasted. Irrigation advancements within the last decade have been astounding. Micro irrigation is one of the latest innovations for applying water and it represents a definite advancement in irrigation technology. It can be defined as the frequent application of small quantities of water on or below the soil surface as drops, tiny streams or miniature sprays through emitters or applicators. It differs from sprinkler irrigation by the fact that only part of the soil surface is wetted. Micro irrigation encompasses a number of methods or concepts such as bubblers, drip, trickle, mist or spray and subsurface irrigation.

Drip irrigation is one of the most efficient methods of irrigation. It is viewed as a promising technology for its ability to support farmers in raising incomes and reducing poverty. A number of benefits have been ascribed to the use of micro-irrigation. In addition to saving of water these include increased yield and productivity of certain crops (especially spaced crops), labour cost savings, electricity savings, lesser pumping hours and hence easier irrigation, better crop growth and also better soil health. Strong evidence exists claiming economic benefits from the adoption of micro-irrigation. However there exists little or sparse evidence of socio-economic benefits from the adoption of micro irrigation. There are mentions of positive nutritional impact on adopting households as well but these are few and far apart.

The water use efficiency under conventional surface method is very low due to substantial conveyance and distribution losses. Recognizing the fast decline of irrigation water potential and increasing demand for water from different sectors, a number of demand management strategies and programmes have been introduced to save water and increase the existing water use efficiency in Indian agriculture. One such method introduced relatively recently in Indian agriculture is micro-irrigation, which includes both drip and sprinkler method of irrigation. Micro-irrigation (MI) is proved to be 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 benefits of micro-irrigation in terms of water saving and productivity gains are substantial in comparison to the same crops cultivated under surface method of irrigation. Micro-irrigation is also found to be reducing energy (electricity) requirement, weed problems, soil erosion and cost of cultivation. The coverage of drip (2.13 percent) and sprinkler (3.30 percent) method of irrigation is very meager to its total potential, which is estimated to be 21.01 million hectares for drip and 50.22 million hectares of sprinkler irrigation method.

Expenditure on the implementation of PMKSY is shared in the ratio of 50:30:20 between centre government, state government and the beneficiary in case of small and marginal farmers. In other words, subsidy assistant for small and marginal farmer will be @ 80% of the cost of the drip/sprinkler irrigation system and the remaining 20% will have to be borne by the farmer. In case of medium and large, subsidy assistance will be @ 50% of the cost of the system which will be shared in the ratios of 50:50 by the central government and the beneficiary.

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2. OBJECTIVES

(1) To study the economics of vegetables and horticultural crops under micro irrigation scheme in Himachal Pradesh.
(2) To examine the shortcoming in micro irrigation scheme and suggest measures to remove this problem.

3. METHODOLOGY

The department of Horticulture, Himachal Pradesh has taken step to popularize the micro irrigation systems in all the districts except for districts of Lahaul-Spiti and Kinnaur. It was therefore that the study was conducted in two districts selected from the remaining ten districts where the micro irrigation systems have been installed. The district Kangra has been purposely selected on the basis of having highest area under Micro Irrigation System. The second district i.e. Bilaspur was selected purposely due to higher number of beneficiaries in comparison to Kullu and Sirmour districts, though the area under MIS was slightly higher in these districts than that in Bilaspur. The selected districts were divided in to two development blocks i.e. Indora and Dehra in district Kangra and Jhanduta and Sadar in Bilaspur district on the basis of having largest number of micro irrigation systems.

To fulfill the objectives of the present study, the sampling design was framed in such a way as to cover all classes of beneficiaries in the sampled schemes. In each of the selected blocks 25 vegetable farmers and orchardists using micro irrigation system have been randomly selected from the areas having sufficient concentration of micro irrigation systems, making it possible to draw the sample. Such areas were identified with the help of concerned officials of department of horticulture. Thus, the study is based on 100 farmers using micro irrigation systems (beneficiary). The selected farmers were further classified into four categories on the basis of the size of their land holdings for quantitative analysis. These are marginal (up to 0 to 1 hectares), small (1 to 2 hectares), medium (2 to 4 hectares), and large (above 4 hectares) of land holdings.

Both secondary as well as primary data has been used in this study. Detailed information was gathered regarding farm resources, cropping system, cost and returns from crops and orchards. The secondary information related to micro irrigation scheme was obtained from different departments of Himachal Pradesh. To make the analysis simple and more understandable, tabulator analysis has been used.

4. RESULTS AND DISCUSSION

In this paper, an attempt has been made to calculate the various cost and returns (Gross value- production cost) incurred on cultivation of crops under unprotected conditions by different categories of sampled beneficiary and non-beneficiary farmers in Himachal Pradesh. It was found that the farmers were growing large variety of crops under unprotected conditions. Hence, the present analysis has been carried out of all crops under MIS. These crops included capsicum, tomatoes, brinjal, cauliflower, cabbage, potatoes, mango, kinnow, pomegranate etc. Cost of cultivation includes various operations inputs and cost of labour. The family labour has also been evaluated at the rate of hired labour. Transportation carriage, handling etc, if any, have been added to purchase price of inputs to work out the actual cost of input applied. Many of the inputs are home produced or some portion of these is home produced. Under such circumstances the home produced inputs have been evaluated at the current market price for working out the cost of cultivation of selected crops.

4.1 Cost and return of cultivation of capsicum under MIS in Himachal Pradesh

The cost of cultivation of capsicum under MIS beneficiary has been presented in Table 1. The cost of cultivation, at overall level, was found Rs. 21212 per hectare and this cost was Rs. 20627.5 for marginal and Rs. 22381 for small farmers among beneficiary household in Himachal Pradesh. It was found that value of human labour was the largest cost component accounting for 26 per cent of the total cost of cultivation followed by manure (25) and fertilizer (14). Insecticides/pesticides application was 13 per cent of the total cost. Returns over variable cost were found to be positive and more than one respectively for capsicum crop, which reveals that farmers cultivating this crop were recovering variable costs as well as getting returns over variable costs incurred.

Table-1
Cost and return of cultivation of capsicum under in MIS

(Cost: Rs./Hact)

Cost Components	Marginal Holding	Small Holding	Medium Holding	Large Holding	All Holding
Seed	2500	3125	-	-	2708.5
Manure	5000	5750	-	-	5250
Fertilizer	3000	2700	-	-	2900
I&P	2727.5	2761	-	-	2738.5
Irrigation	50	75	-	-	58.5
Machinery Labour	1200	1250	-	-	1216.5
Animal Labour	900	970	-	-	923.5
Human Labour	5250	5750	-	-	5416.5
Total Variable Cost	20627.5	22381	-	-	21212
Gross Value of Output	91325	112500	-	-	115500
Returns Over Variable Cost	70697.5	90119	-	-	94288
Input-Output Ratio	4.43	5.03	-	-	5.45

Source: Field Survey

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4.2 Cost and return of cultivation of tomatoes under MIS in Himachal Pradesh

The cost of tomatoes cultivation is given in Table 2. The cost of cultivation, at overall level, was found to be Rs. 54560 per hectare and this cost was Rs. 53022.5 for marginal, Rs. 54862.5 for small and Rs. 57152 for medium size of holding in Himachal Pradesh. The analysis revealed that manure was the largest cost component accounting for 31 per cent of the total cost of cultivation. This was followed by human labour (25%) and Insecticides/pesticides (15%). It was found that the net return from cultivation of Tomatoes was Rs. 253940 per hectare at overall level. However, the net returns were Rs. 240777.5 for marginal, Rs. 279037.5 for small and Rs. 280348 for medium beneficiary farmers in Himachal Pradesh. Input-Output Ratio (over total variable cost) was 5.54, 6.09, 5.91 and 5.65 for marginal, small, medium and all holdings respectively for tomato crop. Returns over variable cost were found to be positive and more than one respectively for tomato crop, which reveals that farmers cultivating this crop were recovering variable cost as well as getting returns over variable cost incurred.

Table-2
Cost and return of cultivation of tomatoes under MIS

(Cost: Rs./Hact.)

Cost Components	Marginal Holding	Small Holding	Medium Holding	Large Holding	All Holding
Seed	6100	6612.5	7200	-	6560.5
Manure	16125	16712.5	18750	-	17046
Fertilizer	4575	4612.5	4631	-	4576
I&P	7940	8125	7910	-	7979
Irrigation	137.5	167.5	225	-	183.5
Machinery Labour	1987.5	2217.5	2375	-	2146.5
Animal Labour	2772.5	2357.5	2276	-	2514.5
Human Labour	13385	14057.5	13785	-	13554.5
Total Variable Cost	53022.5	54862.5	57152	-	54560
Gross Value of Output	293800	333900	337500	-	308500
Returns Over Variable Cost	240777.5	279037.5	280348	-	253940
Input-Output Ratio	5.54	6.09	5.91	-	5.65

Source: Field Survey

4.3 Cost and return of cultivation of brinjal under MIS in Himachal Pradesh

The cost of cultivation for brinjal has been presented in Table 3. Wherein, it may be seen from table that the cost of cultivation, at overall level was found to be Rs. 52922.5 per hectare and this cost was Rs. 51275 for marginal, Rs. 53382.5 for small, Rs. 55125 for medium and Rs. 54705 for large farmers in Himachal Pradesh. The analysis revealed that manure was the largest cost component accounting for 30 per cent and this was followed by human labour, Insecticides/pesticides and seeds. It was found that net return from cultivation of brinjal was Rs. 70452.5 per hectare at overall level in Himachal Pradesh. However, the net returns were Rs. 1088.8.5 for marginal, Rs. 34117.5 for small, Rs. 282375 for medium and Rs.76545 for large beneficiary farmers in H.P. Input-Output Ratio (over total variable cost) was 3.12, 1.64, 6.12, 2.40 and 2.33 for marginal, small, medium, large and all holdings respectively for tomato crop. Returns over variable cost were found to be positive and more than one respectively for brinjal crop, which reveals that farmers cultivating this crop were recovering variable cost as well as getting returns over variable cost incurred.

Table-3
Cost and return of cultivation of brinjal under MIS

(Cost: Rs./Hact.)

Cost Components	Marginal Holding	Small Holding	Medium Holding	Large Holding	All Holding
Seed	6200	6550	7285	6650	6657
Manure	15125	15712.5	17750	15575	16118.5
Fertilizer	4587.5	4630	4665	4750	4605.5
I&P	7940	8125	7910	8375	7990.5
Irrigation	137.5	167.5	225	200	185.5
Machinery Labour	1787.5	2067.5	2175	2100	1975
Animal Labour	2917.5	2412.5	2350	2530	2588
Human Labour	12580	13717.5	12765	14525	12802
Total Variable Cost	51275	53382.5	55125	54705	52922.5
Gross Value of Output	160083.5	87500	337500	131250	123375
Returns Over Variable Cost	108808.5	34117.5	282375	76545	70452.5
Input-Output Ratio	3.12	1.64	6.12	2.40	2.33

Source: Field Survey

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4.4 Cost and return of cultivation of cauliflower under MIS in Himachal Pradesh

The cost of cultivation for cauliflower has been presented in Table 4. It can be seen from the table that the cost of cultivation, at overall level, was found to be Rs. 57959 per hectare and this cost was Rs. 57518 for marginal, Rs. 57355 for small and Rs. 59329 for large size beneficiary farmers.

Table-4
Cost and return of cultivation of cauliflower under MIS

(Cost: Rs./Hact.)

Cost Components	Marginal Holding	Small Holding	Medium Holding	Large Holding	All Holding
Seed	7618.5	7529.5	-	8448	7689.5
Manure	16973	17005	-	18000	17344
Fertilizer	7262.5	7257.5	-	7246	7343
I&P	7126.5	7237.5	-	7224	7187
Irrigation	175	210	-	265	210.5
Machinery Labour	2365.5	2450	-	2565	2441.5
Aanimal Labour	2367.5	2103	-	2200	2215
Human Labour	13632.5	13563	-	13381	13528
Total Variable Cost	57518	57355.5	-	59329	57959
Gross Value of Output	325266.5	332150	-	337500	312750
Returns Over Variable Cost	267748.5	274794.5	-	278171	254791
Input-Output Ratio	5.66	5.79	-	5.69	5.40

Source: Field Survey

Further, the analysis revealed that manure was the largest cost component accounting for 30 percent followed by human labour for 23 percent, seed and fertilizer 13 percent each of the total cost of cultivation. Insecticides/pesticides application was 12 per cent of the total cost. The net return from cultivation of cauliflower was Rs. 254791 per hectare at overall level in Himachal Pradesh. However, the net returns were Rs. 267748.5 for marginal, Rs. 274794.5 for small and Rs. 278171 for large size farm in Himachal Pradesh. Input-Output Ratio (over total variable cost) was 5.66, 5.79, 5.69 and 5.40 for marginal, small, large and all holdings respectively for cauliflower crop. Returns over variable cost were found to be positive and more than one respectively for cauliflower crop, which reveals that farmers cultivating this crop were recovering variable cost as well as getting returns over variable cost incurred.

4.5 Cost and return of cultivation for cabbage under MIS in Himachal Pradesh

The cost of cultivation for cabbage has been presented in Table 5. It can be seen from the table that the cost of cultivation, at overall level was found to be Rs. 53738.5 per hectare and this cost was Rs. 52715.5 for marginal, Rs. 53288 for small and, Rs. 54614 for large size of land holding. Further, the analysis revealed that manure was the largest cost component accounting for 30 percent followed by human labour for 25 percent and seed 13 percent of the total cost of cultivation. Insecticides/pesticides application was 12 per cent of the total cost. The net returns from cabbage cultivation for different size categories are given in Table 5. It can be seen from the table that the net returns from cabbage at overall level in Himachal Pradesh was Rs.261261.5. . Input-Output Ratio (over total variable cost) was 4.82, 4.02, 5.15 and 5.86 for marginal, small, large and all holdings respectively for cabbage crop. Returns over variable cost were found to be positive and more than one respectively for cabbage crop, which reveals that farmers cultivating this crop were recovering variable cost as well as getting returns over variable cost.

Table-5
Cost and return of cultivation for cabbage under MIS

(Cost: Rs./Hact.)

Cost Components	Marginal Holding	Small Holding	Medium Holding	Large Holding	All Holding
Seed	6622.5	6885	-	6970	6747.5
Manure	15940	16250	-	17000	16348.5
Fertilizer	5397.5	5060	-	5333	5426.5
I&P	6400	6400	-	6475	6473.5
Irrigation	165	268	-	280	221
Machinery Labour	2425	2475	-	2500	2446
Animal Labour	2553	2200	-	2256	2421
Human Labour	13212.5	13750	-	13800	13655
Total Variable Cost	52715.5	53288	-	54614	53738.5
Gross Value of Output	254183.5	214300	-	281250	315000
Returns Over Variable Cost	201468	161012	-	226636	261261.5
Input-Output Ratio	4.82	4.02	-	5.15	5.86

Source: Field Survey

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4.6 Cost and return of cultivation for potatoes under MIS in Himachal Pradesh

The cost of cultivation for potatoes has been presented in Table 6. It can be seen from the table that the cost of cultivation, at overall level, was found to be Rs. 66133 and this cost was Rs. 65207.5 for marginal and Rs. 68485 for small size beneficiary farmers in Himachal Pradesh. The analysis revealed that seed was the largest cost component accounting for 28 and this was followed by manure 26 percent and human labour 21 percent in Himachal Pradesh. The net returns from potatoes are given in Table 6. It was found that net return from cultivation of potatoes was Rs. 121367 per hectare at overall level and this return were Rs. 108467.5 for marginal and Rs. 127948 for small beneficiary farmers in Himachal Pradesh. Returns over variable cost were found to be positive and more than one respectively for potatoes crop, which reveals that farmers cultivating this crop were recovering variable cost as well as getting returns over variable cost incurred.

Table-6
Cost and return of cultivation of potatoes under MIS

(Cost: Rs./Hact.)

Cost Components	Marginal Holding	Small Holding	Medium Holding	Large Holding	All Holding
Seed	18275	18950	-	-	18560
Manure	16875	18750	-	-	17250
Fertilizer	4575	4575	-	-	4597.5
I&P	7115	7385	-	-	7170.5
Irrigation	217.5	225	-	-	225
Machinery Labour	2325	2400	-	-	2355
Animal Labour	2425	2200	-	-	2335
Human Labour	13400	14000	-	-	13640
Total Variable Cost	65207.5	68485	-	-	66133
Gross Value of Output	173675	196433	-	-	187500
Returns Over Variable Cost	108467.5	127948	-	-	121367
Input-Output Ratio	2.66	2.87	-	-	2.84

Source: Field Survey

4.7 Cost and return of cultivation for mangoes under MIS Himachal Pradesh

The cost of cultivation for mangoes has been presented in Table 7. It can be seen from the table that the cost of cultivation, at overall level, was found to be Rs. 39260.5 per hectare and this cost was Rs. 36625 for marginal, Rs. 37350 for small, Rs. 39105 for medium and Rs.41315 for large size beneficiary farmers in Himachal Pradesh.

Table-7
Cost and return of cultivation for mangoes under MIS

(Cost: Rs./Hact.)

Cost Components	Marginal Holding	Small Holding	Medium Holding	Large Holding	All Holding
Seed	-	-	-	-	-
Manure	4800	4800	4925	5200	4921.5
Fertilizer	6500	6550	6575	6700	6582
I&P	4500	4500	4575	4700	4577.5
Irrigation	200	235	250	265	255
Machinery Labour	0	0	0	0	0
Animal Labour	0	0	0	0	0
Human Labour	20625	21265	22780	24450	22924.5
Total Variable Cost	36625	37350	39105	41315	39260.5
Gross Value of Output	765233	683671.5	685945.5	746988	686046
Returns Over Variable Cost	728608	646321.5	646840.5	705673	646785.5
Input-Output Ratio	20.89	18.30	17.54	18.08	17.47

Source: Field Survey

It can also be seen from the table that human labour was the largest cost component in Himachal Pradesh. No farmer was observed to be using seed, hired animal labour and hired machinery in this crop. The analysis reveals that the net returns from mango cultivation were Rs. 646785.5 in Himachal Pradesh at overall level. The category wise net return was observed to be Rs. 728608 for marginal, Rs.646321.5 for small, Rs. 646840.5 for medium and Rs.705673 for large farmers in Himachal Pradesh. . Input-Output Ratio (over total variable cost) was 20.89, 18.30, 17.54, 18.08 and 17.47 for marginal, small, medium, large and all holdings respectively for mango crop. Returns over variable cost were found to be positive and more than one respectively for mango crop, which reveals that farmers cultivating this crop were recovering variable costs as well as getting returns over variable cost.

4.8 Cost and return of cultivation for kinnow under MIS Himachal Pradesh

The cost of kinnow cultivation has been presented in Table 8. The cost of cultivation, at overall level, was found to be Rs.

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40255 per hectare and this cost was Rs. 37445 for marginal, Rs. 38325 for small, Rs. 39485 for medium and Rs. 41365 for large beneficiary farmers in Himachal Pradesh. Further, the table reveals that human labour was the largest cost component accounting for 61 per cent of the total cost of cultivation. This was followed by manure (14%) and Insecticides/pesticides (13%).

Table-8
Cost and return of cultivation of kinnow under MIS

(Cost: Rs./Hact.)

Cost Components	Marginal Holding	Small Holding	Medium Holding	Large Holding	All Holding
Seed	0	0	0	0	0
Manure	5495	5500	5700	5865	5754
Fertilizer	4000	4200	4500	5000	4709
I&P	4800	4900	5000	5200	5086
Irrigation	150	275	285	300	282
Machinery Labour	0	0	0	0	0
Animal Labour	0	0	0	0	0
Human Labour	23000	23450	24000	25000	24424
Total Variable Cost	37445	38325	39485	41365	40255
Gross Value of Output	808693	625000	645833	629302	659474
Returns Over Variable Cost	771248	586675	606348	587937	619219
Input-Output Ratio	21.60	16.31	16.36	15.21	16.38

Source: Field Survey

The analysis reveals that the net return from kinnow cultivation at overall level was found to be Rs. 619219 per hectare. However, the net returns from kinnow cultivation was Rs.771244 for marginal, Rs.586675 for small, Rs. 606348 for medium and Rs.587937 for large beneficiary farmers in Himachal Pradesh. . Input-Output Ratio (over total variable cost) was 21.60, 16.31, 16.36 , 15.21 and 5.40 for marginal, small, medium, large and all holdings respectively for kinnow crop. Returns over variable cost were found to be positive and more than one respectively for kinnow crop, which reveals that farmers cultivating this crop were recovering variable cost as well as getting returns over variable cost.

4.9 Cost and return of cultivation for pomegranate under MIS in Himachal Pradesh.

The cost of pomegranate cultivation has been presented in Table 9. The cost of cultivation, at overall level, was found to be Rs. 40642 per hectare and this cost was Rs. 36575 for marginal, Rs. 39025 for small, and Rs.42975 for medium beneficiary farmers in Himachal Pradesh. Further, the table reveals that human labour was the largest cost component accounting for 55 per cent of the total cost of cultivation. This was followed by fertilizer (17%) and Insecticides/pesticides (14%). The net returns from pomegranate cultivation for different size categories in Himachal Pradesh among the beneficiary farmers are given in Table 10. It was found that net return from cultivation of pomegranate was Rs.1535445 per hectare at overall level. However, the net returns were Rs.1525925 for marginal and Rs. 1541434 for small and Rs.1519525 for medium beneficiary farmers in Himachal Pradesh. . Input-Output Ratio (over total variable cost) was 42.72, 40.50, 36.36 and 38.78 for marginal, small, medium and all holdings respectively for pomegranate crop. Returns over variable cost were found to be positive and more than one respectively for pomegranate crop, which reveals that farmers cultivating this crop were recovering variable cost as well as getting returns over variable cost.

Table-9
Cost and return of cultivation of pomegranate under MIS

(Cost: Rs./Hact.)

Cost Components	Marginal Holding	Small Holding	Medium Holding	Large Holding	All Holding
Seed	0	0	0	-	0
Manure	5225	5350	5400	-	5354
Fertilizer	6200	6500	7000	-	6706
I&P	5000	5400	6800	-	6054
Irrigation	150	200	225		204
Machinery Labour	0	0	0	-	0
Animal Labour	0	0	0	-	0
Human Labour	20000	21575	23550	-	22323
Total Variable Cost	36575	39025	42975	-	40642
Gross Value of Output	1562500	1580459	1562500	-	1576087
Returns Over Variable Cost	1525925	1541434	1519525	-	1535445
Input-Output Ratio	42.72	40.50	36.36	-	38.78

Source: Field Survey

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5. CONCLUSION AND RECOMMENDATION

The per hectare costs of cultivation of capsicum, tomato, brinjal, cauliflower, cabbage, potatoes, mangoes, kinnows and pomegranate at overall level have been worked out to be Rs. 21212, Rs. 45560, Rs. 52922.5, Rs. 57959, Rs. 53738.5, Rs. 66133, Rs. 39260.5, Rs. 40255, and Rs. 40642 in Himachal Pradesh respectively. The manure and human labour was the largest cost component among the MIS beneficiary farmers in Himachal Pradesh. For the horticultural crops, fertilizer and human labour was the largest cost component among the beneficiary farmers in both the districts. On an average, the per hectare net returns from the cultivation of capsicum, tomato, brinjal, cauliflower, cabbage, potatoes, mangoes, kinnow and pomegranate at overall level, have been worked out to be Rs. 94288, Rs. 253940, Rs. 70452.5, Rs. 254791, Rs. 261261.5, Rs. 121367, 646785.5, Rs. 619219 and Rs. 1535445 in Himachal Pradesh respectively.

The major problems related to installation of Micro Irrigation System, which were reported by farmers, are information delay, misleading information, information regarding Micro Irrigation System not broad cast in newspaper, television and radio etc. The design of micro irrigation system not was provided by the concern authorities, available design was high technological and it was difficult to implement those. The various problems faced by the farmers in the study area related to transportation facilities were; non availability of vehicles in time, long wait to get vehicles or payment of more charges during the peak season of vegetables and horticultural crops. Besides transportation, problems like shortage of packing material, high prices of these and lack of storage facilities were also of major concerned to the grower in the study areas. The prices of produce depend mainly on the market conditions, and if the growers do not have proper information regarding market, then they cannot take the advantage of high prices. The farmers were facing the problems of getting late information, information available for few markets only, inadequate information and misleading information. Sometimes vegetable growers get very little out of their sale because of low prices in the market, high marketing cost, malpractices by commission agents and other market functionaries etc. In most of the cases, commission agents quote lower prices than the actual one.

It is clear from the above discussion that the Micro Irrigation Scheme in Himachal Pradesh has increased the production, productivities and income of the farmers. But in spite of these, there are many problems faced by farmers. The following suggestions are given to improve the conditions of these farmers.

- Establishment of vegetable and fruits processing units in producing areas can improve the profitability by reducing the losses in picking, grading and packing etc. This will also solve the problem of packing material and transportation up to some extent.
- Arrangement should be made to provide low interest loan, sanction of loan and subsidies in time, good quality of seed and fertilizer.
- Government should organize awareness camps about Micro Irrigation System at Village levels.
- Keeping in view the perishable nature of vegetables and fruits and variations in market prices, adequate storage facilities should be developed.
- Arrangement should be made to provide latest information regarding prices and arrivals of the vegetables and fruits in the markets.
- The emphasis should be given to expand the market facilities and on developing infrastructure by improving packing and transportation facilities.
- In present marketing system of vegetables and fruits, most of the benefits are reaped by the middleman. An attempt should be made to strengthen the marketing system by organizing cooperative societies, particularly for small farmers. This will help in minimizing the margin of the intermediaries and will ultimately ensure better producers share in consumer rupee.

6. REFERENCES

1. *Puranik, R. P., Khonde, S. R., and Ganorkar, P. L. (1992), Constraints and problems as perceived by non adopters and adopters of drip irrigation systems, Agricultural Situation in India, 47(1):33-34.*
2. *Sivanappan, R.K. (1994), Prospects of micro-irrigation in India, Irrigation and Drainage Systems, **8** (1):49-58.*
3. *Reddy, K. S. and Reddy, G. P. (1995), Micro irrigation for water scarce areas, Yojana, 39(8): 39-42.*
4. *Narayanamoorthy, A. (1997), Economic Viability of drip irrigation: An empirical analysis from Maharashtra, Indian Journal of Agricultural Economics, 52(4): Oct.-Dec.*
5. *Narayanamoorthy, A. (2005), Economics of drip irrigation in sugarcane cultivation: Case study of a farmer from Tamil Nadu, Indian Journal of Agricultural Economics, **60** (2):.235-248.*
6. *Dhawan, B.D. (2000). Drip irrigation: Evaluating returns, Economic and Political Weekly, **35**(42): 3775-3780.*
7. *Narayanamoorthy, A. (1997), Drip irrigation: A viable option for future irrigation development, Productivity, **38** (3): 504-511.*
8. *Narayanamoorthy, A. (2003), Averting water crisis by drip method of irrigation: A study of two water intensive crops, Indian Journal of Agricultural Economics, **58**(3): 427-437.*
9. *Kannan, S. and Gurumurthy, S. (1999), Drip irrigation and water management, Yojana, 13(1): 15-16.*
10. *Narayanamoorthy, A. and Deshpande, R. S. (1998), Economics of drip irrigation: A comparative study of Maharashtra and Tamil Nadu, Mimeograph Series No. 47, Agro-Economic Research Centre, Gokhale Institute of Politics and Economics, Pune, Maharashtra.*