

Original Article

Impact of Agricultural Diversification on Household Agricultural Income in the Mid Hill Zone of Himachal Pradesh

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Abstract - The present study is conducted to work out the pattern and impact of agricultural diversification on the agricultural income of the households before and after diversification in the Mid hill Zone of Himachal Pradesh, India. This study reveals that before agricultural diversification, the major source of households income was traditional foodgrains, crops and livestock. After agricultural diversification, the household's source of income has been shifted from traditional crops to cash crops like vegetables, floricultural crops and horticultural crops. Diversification has led to a significant increase in their income and has also generated more employment due to multi- crops production throughout the year. The impact of agricultural diversification has been a workout and explained with the help of primary data collected and presented in the tables.

Keywords – Agricultural Diversification, Household Income, Mid Hill Zone, Himachal Pradesh.

I. INTRODUCTION

In the rural economy of Himachal Pradesh, crop production is a dominant activity. Initially, this sector was dominated by the production of traditional subsistence crops, but later on, the production of vegetables, fruits and flowers have also been included in the cropping pattern. This study is conducted to find out the impact of agricultural diversification on the agricultural income of the households in the Mid Hill Zone of Himachal Pradesh. In the present study, the Kandaghat block of Solan district, Gohar and Karsog blocks of Mandi districts were selected randomly.

II. OBJECTIVES OF THE PRESENT STUDY

The specific objectives of the present study are: -

1. To study the pattern of household's agricultural income before diversification in the study area.
2. To study the pattern of household's agricultural income after diversification in the study area.
3. To study the impact of agricultural diversification on the agricultural income of the households in the study area.

III. SAMPLING PROCEDURE

The present study is based on primary data. The primary data has been collected from the selected households with the help of a pre-tested schedule by conducting a personal interview of selected farmers.

IV. NATURE OF DATA COLLECTED

By conducting the personal interview of the selected households, data pertaining to family composition, literacy, operated area (i.e. owned land, leased in and leased out land), household assets and durables, income, employment, consumption expenditure and borrowings have been recorded on a pre-tested schedule as it existed at the time of the survey. The information relating to the quality and value of agricultural inputs, i.e. seeds, fertilizers, manures, implements, insecticides, and pesticides, family human labour days (hired in or hired out, permanently attached labour), bullock labour days, machinery charges vis-à-vis the value of main and by-products of food grain crops and other field crops have been collected during the year 2019-20 for both the pre and post-agricultural diversification period along with the problems faced in agricultural diversification as well as suggestions of the households for the further diversification have been recorded.

V. STATISTICAL TOOLS OF ANALYSIS

After arranging the data in homogeneous categories and by working out the averages and percentages, the following statistical tools have been used:

A. Tabular Analysis

The net returns from food grain and other field crops have been worked out with the help of tabular analysis, i.e. by deducting the total cost incurred from the total value of output at the prevailing prices in the study area.

B. Total Value of Output

It includes the value of food grains (both main and by-product) as well as other field crops at prevailing local prices.



C. Total Cost

The total cost incurred in the production of food grains and other field crops by parts, i.e. cost A₁, A₂, B and C, which have been worked out as follows:

Cost A₁: This includes the value of hired human labour, the value of hired bullock labour, hired machinery charges, the value of owned machine labour, the value of seed (both purchased and produced), the value of insecticides and pesticides, the value of manure (owned and purchased) value of fertilizers, depreciation of implements and farm building, irrigation charges, land revenue, taxes, interest on working capital and miscellaneous expenses.

Cost A₂: Cost A₁ plus rent paid for leased-in land.

Cost B: Cost A₂ plus the imputed rental value of owned landless land revenue paid thereon + imputed interest on owned fixed capital (excluding land).

Cost C: Cost B plus imputed value of family labour used.

D. Net Returns

Thus the net returns have been worked out equal to the total value of the output of food- grain crops (both main and by-product) and other field crops minus total cost involved in the production of these crops during the year preceding the survey in the study area.

E. Imputed Value

The imputed value of owned resources has been calculated by taking into account the owned seed and farmyard manures at village market prices prevailing at sowing time and owned bullock labour days at market rates prevailing in the study area. The family human labour cost has been imputed at the same rate as applicable to casual labour while taking into account the statutory minimum or actual wage, whichever is higher. The rate of interest on working capital has been charged at 12.5 per cent per annum as per the prevailing rate for working capital being charged by all the banks during the time of the survey, and the rental value of owned land has been calculated as one-fifth of the value of output at farm gate price. The depreciation on farm implements, machinery,

and buildings has been worked out by dividing their present replacement value by their expected life. The total depreciation has been distributed over different crops based on the area under each crop. The gross farm income has been defined as the gross value of output, including the value of by-products at farm harvest rates. The net farm income represents the remuneration for the farmer's management and has been calculated by deducting expenses (cost of cultivation) from the gross farm income.

$$\text{Net Farm Income} = \text{Gross Farm Income} - \text{Cast C (total cost)}$$

VI. PATTERN OF HOUSEHOLD PER MONTH AGRICULTURAL INCOME BEFORE AGRICULTURAL DIVERSIFICATION

In Himachal Pradesh, agriculture, horticulture and floriculture are the major sources of income. The pattern of household per month agricultural income before agricultural diversification has been presented in Table 1 for the sample households. This table clearly shows that farm income from food grain crops accounted for 43.18, 44.57, 48.68 and 50.73 per cent on the marginal, small, semi- medium and medium farmers respectively, whereas this percentage for all holdings together, has been calculated 46.92 per cent. The share of vegetables has been less before diversification among all the size of holdings, which has been came out 7.21, 9.91, 15.47 and 20.04 per cent on the marginal, small, semi- medium and medium size of holdings respectively. This percentage for all sizes of holdings together has been worked out 13.24 per cent. Livestock has been another important activity before diversification, and its share in the total income has been worked out 46.33, 42.68, 32.73 and 25.94 per cent on the marginal, small, semi- medium and medium size of holdings respectively, whereas this percentage came out 36.98 per cent for all size of holdings together. The other agricultural activities accounted for 2.68, 2.84, 3.12 and 3.28 per cent of the total income among the marginal, small, semi- medium and medium size of holdings respectively, whereas this percentage for all sizes of holdings together has been came out 2.86 per cent.

Table 1. Household per month agricultural income before agricultural diversification among the sample households (Value in Rupees)

Particulars	Marginal Holdings	Small Holdings	Semi-Medium Holdings	Medium Holdings	All Holdings
Food Grain Crops	1747.98 (43.18)	3660.42 (44.57)	7242.16 (48.68)	13810.45 (50.73)	6215.25 (46.92)
Non- Food Grain Crops (Vegetables)	316.09 (7.21)	814.05 (9.91)	2301.33 (15.47)	5456.76 (20.04)	1753.83 (13.24)
Livestock and Products	1875.78 (46.33)	3505.03 (42.68)	4869.42 (32.73)	7063.30 (25.94)	4898.55 (36.98)
Horticultural Crops	—	—	—	—	—
Floricultural Crops	—	—	—	—	—
Others*	108.49 (2.68)	233.24 (2.84)	464.16 (3.12)	892.93 (3.28)	378.85 (2.86)
Total Income	4048.34 (100)	8212.74 (100)	14877.07 (100)	27223.44 (100)	13246.48 (100)

Note: Figures in parentheses indicate percentages to the column total. Other* include poultry, forestry, fisheries, logging, beekeeping etc.

This table further reveals that income from food grain crops, vegetables and other agricultural activities showed an increasing tendency with an increase in the size of holdings, whereas with an increase in the size of holdings, the percentage income from livestock has shown a decreasing tendency. It happened mainly due to the reason that marginal and small farmers supplement their meager household income by selling livestock products.

2 clearly depicts that income from food grain crops has been reduced steeply, and contrary to it, the income from vegetable crops, horticultural crops, floricultural crops and livestock activities has shown an increasing tendency with an increase in the size of holdings. This table reveals that income from food grain crops accounted for 18.46, 18.33, 11.22 and 7.22 per cent on the marginal, small, semi-medium and medium size of holdings respectively, whereas for all holdings together, this percentage has been worked out 13.89 per cent.

VII. PATTERN OF HOUSEHOLD PER MONTH AGRICULTURAL INCOME AFTER AGRICULTURAL DIVERSIFICATION

After agricultural diversification, the source-wise per month pattern of per household income has changed. Table

Table 2. Household Per Month Agricultural Income After Agricultural Diversification Among the Sample Households (Value in Rupees)

Particulars	Marginal Holdings	Small Holdings	Semi-Medium Holdings	Medium Holdings	All Holdings
Food Grain Crops	1065.80 (18.46)	2232.59 (18.33)	2583.84 (11.22)	3089.56 (7.22)	2755.27 (13.89)
Non- Food Grain Crops(Vegetables)	1874.38 (32.46)	4447.90 (36.51)	11092.50 (48.18)	21913.30 (51.22)	8411.51 (42.41)
Livestock	2115.86 (36.64)	3885.26 (31.89)	5461.53 (23.72)	7836.44 (18.32)	5452.25 (27.49)
Horticultural Crops	361.67 (6.26)	840.94 (6.90)	2326.67 (10.11)	6680.35 (15.61)	1951.21 (9.84)
Floricultural Crops	187.50 (3.25)	404.05 (3.32)	775.09 (3.37)	1671.15 (3.91)	680.87 (3.43)
Others*	169.78 (2.94)	370.39 (3.04)	732.53 (3.40)	1589.85 (3.72)	581.52 (2.93)
Total Income	5774.99 (100)	12181.13 (100)	23022.26 (100)	42780.68 (100)	19832.63 (100)

Note: Figures in parentheses indicate percentages to the column total. Others* include poultry, forestry, fisheries, logging, beekeeping etc.

The percentage of income from vegetables shows an increasing tendency with an increase in the size of holdings. It means that the maximum sample households have shifted the area from the cultivation of foodgrain crops to the production of vegetables horticultural and floricultural crops, which are more remunerative in nature. The reverse trend has been observed in the case of livestock activities, i.e. with an increase in the size of holdings, the income from livestock shows a decreasing tendency. This happened mainly due to the reason that semi- medium and medium farmers mostly use the livestock products for domestic use, whereas the households falling on the marginal and small size of holding groups sell the livestock products in the market in order to supplement their meagre household income. The percentage share of income from vegetables accounted for 32.46, 36.51, 48.18 and 51.22 on the marginal, small, semi- medium and medium size of holdings, respectively, whereas this percentage has been worked out 42.41 per cent for all sizes of holdings together.

Livestock activities occupy the most important position among the marginal and small farmers as they accounted for 36.64 and 31.89 per cent of the total monthly income, respectively. Among the semi- medium and medium size of holdings, this percentage has been worked out 23.72 and 18.32 per cent of their total income respectively, whereas this percentage share of income among all size of holdings has been recorded 27.49 per cent. In the case of horticultural crops, the percentage share in the total income of the marginal and small farmers has been worked out less due to their small size of holdings as compared to the semi- medium and medium size of holdings. The horticultural crops accounted for 6.26, 6.90, 10.11 and 15.61 per cent of the total monthly income on the marginal, small, semi- medium and medium size of holdings, respectively, whereas this percentage for all holdings together, has been worked out 9.84 per cent. The percentage share of floricultural crops in the total monthly income has been recorded 3.25, 3.32, 3.37 and 3.91 per cent on the marginal, small, semi-medium and

medium size of holdings, respectively. For all sizes of holdings together, this percentage has been worked out 3.43 per cent. The other activities have accounted for 2.94, 3.04, 3.40 and 3.72 per cent of the total monthly income on the marginal, small, semi- medium, and medium size of holdings, respectively, whereas for all sizes of holdings together, this percentage came out 2.93 per cent. Further, this table clearly shows that after agricultural diversification, the percentage share of income from commercial crops like vegetables, horticulture and floriculture has increased significantly, especially on the semi- medium and medium size of holding groups.

VIII. IMPACT OF AGRICULTURAL DIVERSIFICATION ON THE HOUSEHOLD PER MONTH AGRICULTURAL INCOME

The comparison of the pre diversification and post diversification per household per month income has been presented in Table 3. This table clearly depicts that 16.85, 17.38, 31.30, and 39.38 per cent decrease has been recorded in the income from foodgrains crops on the marginal, small, semi- medium and medium size of holdings respectively, whereas, for all sizes of holdings together, this percentage has been worked out 26.12 per cent. In the case of vegetable crops, about 38.49, 44.25, 59.09, and 60.45 per cent increase in the income has been calculated on the marginal, small, semi- medium and medium size of holdings respectively, whereas this percentage for all sizes of holdings together has been worked out 50.26 per cent.

Table 3. Change in household per month agricultural income after agricultural diversification among the sample households (Value in Rupees)

Particulars	Marginal Holdings	Small Holdings	Semi-Medium Holdings	Medium Holdings	All Holdings
Food Grain Crops	- 682.18 (-16.85)	- 1427.83 (-17.38)	- 4658.32 (-31.30)	- 10720.89 (-39.38)	- 3459.98 (-26.12)
Non-Food Grain Crops (Vegetables)	+1558.29 (+38.49)	+3633.85 (+44.25)	+8791.17 (+59.09)	+16456.57 (+60.45)	+6657.68 (+50.26)
Livestock	+240.08 (+5.93)	+380.23 (+4.63)	+592.11 (+3.98)	+773.14 (+2.84)	+553.70 (+4.18)
Horticultural Crops	+361.67 (+8.93)	+840.94 (+10.24)	+2326.77 (+15.64)	+6680.35 (+24.54)	+1951.21 (+14.73)
Floricultural Crops	+187.50 (+4.63)	+404.05 (+4.92)	+775.09 (+5.21)	+1671.15 (+6.14)	+680.87 (+5.14)
Others*	+61.29 (+1.51)	+137.15 (+1.67)	+318.37 (+2.14)	+696.92 (+2.56)	+202.67 (+1.53)
Total Change in Income	+1726.65 (+42.65)	+3968.39 (+48.32)	+8145.19 (+54.75)	+15557.24 (+57.15)	+6586.15 (+49.72)

Note: Figures in parentheses indicate percentages to the column total.

- + Indicates increase.
- Indicates decrease.

Others* include poultry, forestry, fisheries, logging, beekeeping etc.

The income from livestock activities shows 5.93, 4.63, 3.98 and 2.84 per cent increase on the marginal, small, semi- medium and medium size of holdings respectively, whereas, among all sizes of holdings together, this increase has been recorded 4.18 per cent. The increase in income from horticultural crops shows a higher percentage increase among the semi- medium and medium farmers due to their large size of holdings as compared to the marginal and small farmers. The per month percentage increase in the income of the marginal, small, semi- medium and medium size of holdings has been recorded 8.93, 10.24, 15.64 and 24.54 per cent respectively, whereas, among all sizes of holdings together, this percentage increase in income has been worked out 14.73 per cent. In the case of floricultural crops, the per month percentage increase in income of all sizes of holdings together has been calculated 5.14 per cent, whereas this

percentage increase on the marginal, small, semi- medium and medium size of holdings has been recorded 4.63, 4.92, 5.21 and 6.14 per cent respectively. The income from other activities has also shown an increasing tendency with an increase in the size of holdings. The per month percentage increase in income from other activities has been worked out 1.51, 1.67, 2.14 and 2.56 per cent on the marginal, small, semi- medium and medium size of holdings respectively, whereas this percentage for all size of holdings together, has been calculated 1.53 per cent. This table clearly shows that there has been a decrease in the income from food grain crops after agricultural diversification, but the income from vegetables horticultural and floricultural crops has shown a significant increase. As a result, the overall increase in per month income of the marginal, small, semi- medium and medium size of holdings has been recorded 42.65, 48.32, 54.75 and

57.15 per cent, whereas, among all sizes of holding together, this percentage increase has been recorded 49.72 per cent. The marginal and small farmers have raised their household income mainly through the cultivation of vegetables and rearing of livestock due to their small size of holdings, while semi- medium and medium farmers have raised their income mainly through vegetables and horticultural crops due to their large size of holdings.

IX. CONCLUSION

The present study shows that there is a significant change in the household income of all the holdings after agricultural diversification. Before diversification, all the holdings were totally engaged in the production of traditional crops, i.e. foodgrains and were earning only 13246.48 rupees per month. After agricultural diversification, when all the holdings started production of high-yielding cash crops such as vegetables, horticultural and floricultural crops, the per month income for all the holdings in aggregate has increased to 19832.63 rupees per month. Thus the impact of diversification on household agricultural income is clearly seen in terms of increase in per month income. This impact makes the present study important even for the further scope of agricultural diversification in the Hilly State like Himachal Pradesh.

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