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NATURE AND EXTENT OF CROP DIVERSIFICATION IN THE TRIBAL ECONOMY OF HIMACHAL PRADESH

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ABSTRACT

An attempt has been made to study the land use pattern, cropping pattern, cropping intensity and magnitude of crop diversification in the tribal areas of Himachal Pradesh. A multistage random sampling technique and Herfindhal Index has been applied to achieve the objectives. The results show that the crop diversification is comparatively less among the marginal holdings as compared to small and medium size of holdings. The diversification in agriculture took place due to increasing trend of agricultural productivity because of technical changes and use of high yielding variety of seeds, fertilizers, pesticides and improved method of cultivation in agriculture. The level of diversification of crop enterprise reflects the extent of economic development in rural sector. The rural economy, crop diversification has been largely considered as a ray of hope for its economic uplift. The diversification in agriculture is also practiced with a view to avoid risk and uncertainty due to climatic and biological vagaries.

WORDS KEY: ***Crop Diversification, Tribal, Himachal Pradesh***

INTRODUCTION

The tribal areas of Himachal Pradesh have a rugged and tough terrain, inhospitable climate, and remain snowbound and comparatively inaccessible; these are of no consequences in the economy of the Pradesh and the country. Chandra-Bhaga or Chenab, Satluj, Ravi, Beas, and a number of other rivulets or streams either originate in or traverse though the tribal areas of the Pradesh. Similarly, many snow-beds or snow-fields and glaciers which serve as perennial sources of water are located in the tribal belt. These areas have a strategic location from the socio-economic point of view in the north-west of the country as the perennial rivers which feed the rich granaries of the nation in the Indo-Gangetic plains of Panjab, Haryana, Uttar Pradesh and Rajasthan have their watersheds there in the tribal areas. In the recent past, the economic potential of the tribal area has been visualized, assessed and highlighted from other diverse angles as well. There is no doubt that the tribal economy has been mainly agro-pastoral, and agriculture continues to be the mainstay of the overwhelmingly large number of tribal people. The physical environment and ecological setting of the tribal area have certain comparative and even absolute advantages in producing certain valued crops and fruits, medicinal herbs and plants cultivated or growing wild. To be precise, kuth, hops, disease free seed potatoes and certain off-season vegetables and seeds, kala zeera, chikori, fafra, ogla, saffron, dry fruits like chilgoza, pistachio nuts, apricot, almonds, walnut, raisin grapes, sea buckthorn, etc. can only be produce in the tribal areas. Even the quality apples from certain areas like Kinnaur are much more valued than the apples of traditional apple belts of Himachal. Whenever some of these commercial crops are exported, these also fetch good foreign exchange for the country.

OBJECTIVE AND METHODOLOGY

The tribal areas in the State of Himachal Pradesh constitute the universe of the present empirical investigation which consist of the district Kinnaur, Lahaul & Spiti, Bharmour and Pangi blocks of Chamba district. All the development blocks in each of the above three districts have been arranged in an ascending order on the basis of their respective population and one block has been selected randomly form each district. The selected blocks are Pooh block of district Kinnaur, Lahual block of district Lahaul & Spiti and Bharmour block of Chamba district. At the second stage all the panchayats in each of the selected block have been arranged in an ascending order on the basis of their respective population and three panchayats have been selected randomly in each selected block. The selected panchayats are gram panchayat Kanam, Labrang and Spillow in Pooh block, Gram Panachayat

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Trilokinath, Jhalma and Muring of Lahual block and gram panchayat Bharmour, Sanchuhi and Parndhala of Bharmour block. Finally a sample of 110 households, have been selected randomly in proportion to the total number of households falling in each holding group. The total sample consists of 60 marginal, 35 small and 15 medium farmers.

The magnitude of crop diversification among the sample household has been worked out with the Help of Herfindhal Index.

$$\text{Herfindhal Index} = \sum_{i=1}^{n} pi^2$$

Where

Pi = is the proportion of area under ith crop and

$$Pi = \frac{Ai}{\sum_{i=1}^{n} Ai}$$

In which

Ai = actual area under ith crop.

I = 1, 2, 3----------n (Number of crops)

n = total number of crops.

The index is defined as sum of the squares of all 'n' proportions and is a measure of concentration. For increasing diversification, H is decreasing and vice-versa. It is bounded by '0' (complete diversification) and 1 (complete specialization). Herfindhal index is an inverse measure of crop diversification. It assumes that very large alternative of production choices are available. Taking the case of crops, Herfindhal Index assumes that there exist a very large number of crops, which can be grown by the farmers. If the total area was equally shared among the large number of crops alternatives then the share of each crop would be near to zero. Therefore, this index uses deviations between actual shares of each crop against equal share of all possible alternatives given by zero.

RESULTS AND DISCUSSION

Land Use Pattern

The examination of land use pattern showed that the average cultivated land shows an increasing tendency and uncultivated land shows a decreasing tendency with an increase in the size of holdings. The percentage value of cultivated land is highest on the smaller holdings mainly due to the reason that with their tiny holdings they cultivate the available land area more intensively in order to meet out their domestic food requirements. The percentage of cultivated land on the marginal, small and medium size of holdings has been worked out 85.71, 67.48 and 66.52 respectively. Among all the holdings together this value came out 71.43. The percentage of uncultivated land on the marginal, small and medium size of holdings has been worked out 14.29, 32.52 and 33.48 respectively. Among all the holdings together this value came out 28.57.

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Table: 1
Land Use Pattern among the Sample Households

(Area in Hectares, per Household)

Particulars	Size of Holdings			
	Marginal Holdings	Small Holdings	Medium Holdings	All Holdings
1. Cultivated Land	0.30 (85.71)	0.83 (67.48)	3.10 (66.52)	0.85 (69.67)
Neat Area Sown	0.28 (80.00)	0.78 (63.41)	3.02 (64.81)	0.81 (66.39)
Current Fallow	0.01 (2.86)	0.03 (2.44)	0.07 (1.50)	0.02 (1.64)
Other Fallow	0.01 (2.86)	0.02 (1.63)	0.03 (0.64)	0.02 (1.64)
2. Uncultivated Land	0.05 (14.29)	0.40 (32.52)	1.56 (33.48)	0.37 (30.33)
Area not available for Cultivation	0.01 (2.86)	0.10 (8.13)	0.42 (9.01)	0.09 (7.38)
Cultivable Waste Land	0.01 (2.86)	0.10 (8.13)	0.35 (7.51)	0.09 (7.38)
Permanent Pasture and Grazing Land	0.02 (5.71)	0.15 (12.20)	0.60 (12.88)	0.14 (11.48)
Area Exclusively under Miscellaneous Tree and Tree Crops	0.01 (2.86)	0.05 (4.07)	0.19 (4.08)	0.05 (4.10)
Total	0.35 (100)	1.23 (100)	4.66 (100)	1.22 (100)

Note: Figures in parentheses denote percentages to the column total.
Source: Primary Probe

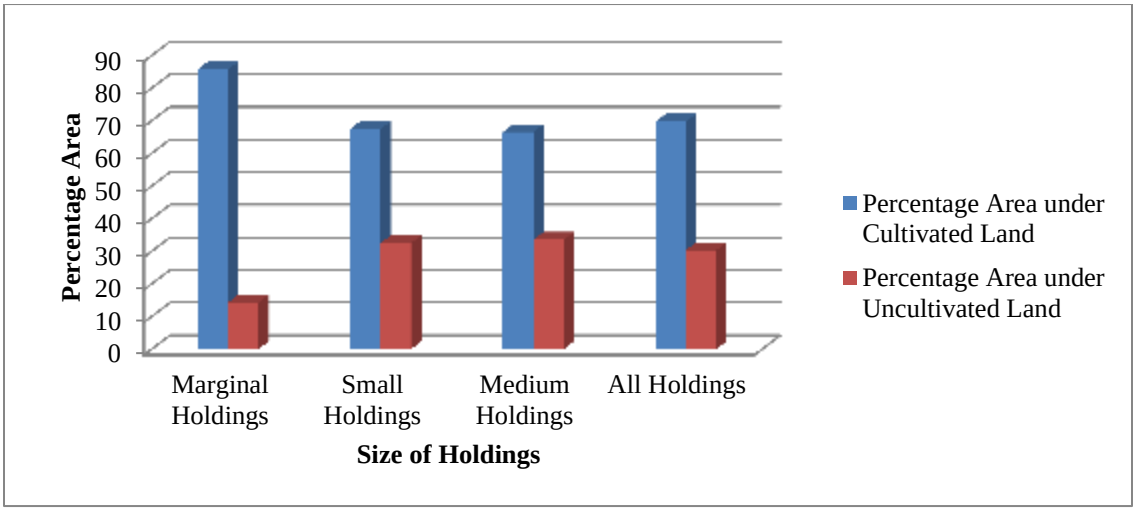

Figure: 1

Cropping Pattern

The percentage of area under field crops on the marginal, small and medium size of holdings has been worked out 74.42, 66.36 and 62.38 respectively. Among all the holdings together this value came out 62.38. The percentage of area under horticultural crops on the marginal, small and medium size of holdings has been worked out 25.58, 33.64 and 37.62 respectively. Among all the holdings together this value came out 33.33.

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Table: 2
Cropping Pattern and Cropping Intensity among the Sample Households
(Area in Hectare, per Household)

Particulars	Size of Holdings			
	Marginal Holdings	Small Holdings	Medium Holdings	All Holdings
1. Field Crops				
Maize	0.03 (6.98)	0.25 (23.26)	0.35 (8.50)	0.14 (12.28)
Pulses	0.02 (4.65)	0.11 (10.28)	0.34 (8.25)	0.09 (7.89)
Wheat	0.03 (6.98)	0.13 (12.15)	0.35 (8.50)	0.11 (9.65)
Barely	0.01 (2.33)	0.05 (4.67)	0.33 (8.01)	0.07 (6.14)
Potato	0.20 (46.51)	0.07 (6.54)	0.50 (12.14)	0.20 (17.50)
Peas	0.02 (4.65)	0.05 (4.67)	0.40 (9.71)	0.08 (7.02)
Small millets	0.01 (2.33)	0.05 (4.67)	0.30 (7.28)	0.06 (5.26)
Sub-Total	0.32 (74.42)	0.71 (66.36)	2.57 (62.38)	0.75 (65.79)
2. Horticultural Crops	0.11 (25.58)	0.36 (33.64)	1.55 (37.62)	0.39 (34.21)
Gross Cropped Area (1+2)	0.43 (100)	1.07 (100)	4.12 (100)	1.14 (100)
Cropping Intensity	153	137	136	141

Note: Figures in parentheses denote percentages to the column total.
Source: Primary Probe

The Table further reveals that the percentage of area under field crops shows a decreasing tendency with an increase in the size of holdings. Contrary to it the percentage of area under horticulture crops shows an increasing tendency with an increase in the size of holding. This tendency in the use of land takes place due to the reason that the horticultural crops are more remunerative than the field crops. Due to this reason larger holding group invest more in horticultural crops as compared to field crops.

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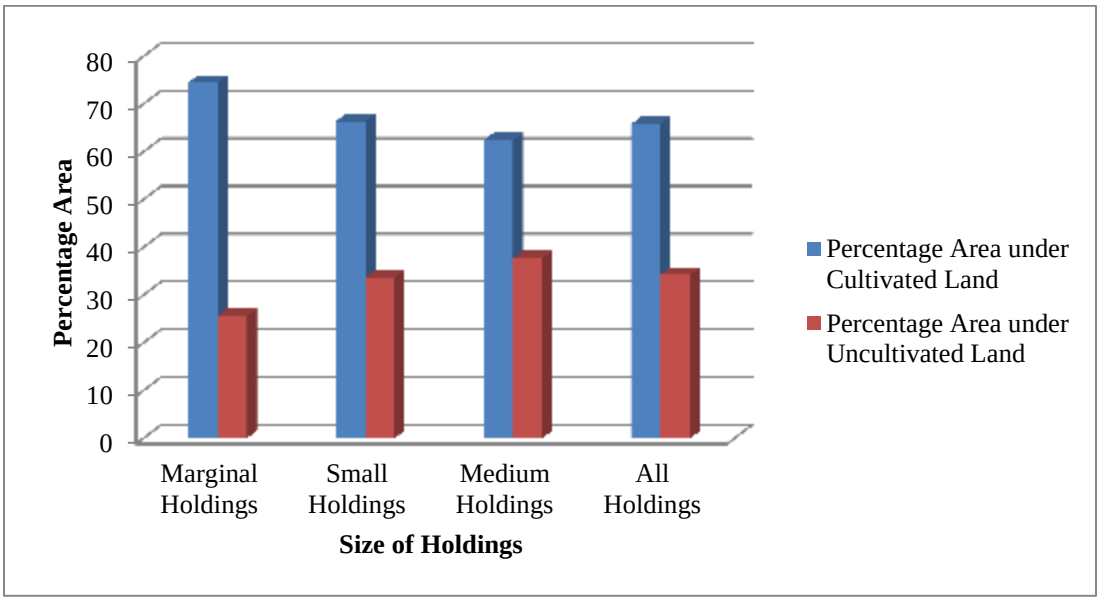

Figure: 2

Cropping Intensity

The cropping intensity represents the percentage of the gross cropped area to the net area sown. Table 2 revealed that the cropping intensity on the marginal, small and medium size of holdings has been worked out 153, 137 and 136 respectively. Among all the holdings together this value came out 141.

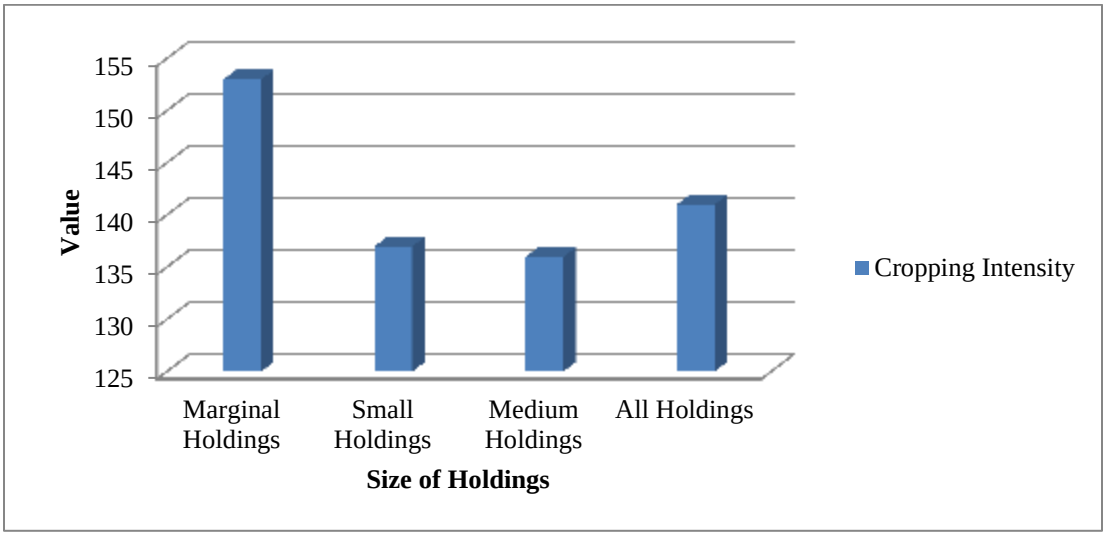

Figure: 3

Crop Diversification

The value of Herfindhal Index on the marginal, small and medium size of holdings has been worked out 0.2969, 0.2039 and 0.1987 respectively. Among all the holdings together this value came out 0.1899.

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Table: 3
Magnitude of Crop Diversification among the Sample Households

Particulars	Size of Holdings											
	Marginal Holdings			Small Holdings			Medium Holdings			All Holdings		
	Ai	Pi	Pi^2	Ai	Pi	Pi^2	Ai	Pi	Pi^2	Ai	Pi	Pi^2
Maize	0.03	0.0698	0.0049	0.25	0.2336	0.0546	0.35	0.0850	0.0072	0.14	0.1228	0.0151
Pulses	0.02	0.0465	0.0022	0.11	0.1028	0.0106	0.34	0.0825	0.0068	0.09	0.0789	0.0062
Wheat	0.03	0.0698	0.0049	0.13	0.1215	0.0148	0.35	0.0850	0.0072	0.11	0.0965	0.0093
Barely	0.01	0.0233	0.0005	0.05	0.0467	0.0022	0.33	0.0801	0.0064	0.07	0.0614	0.0038
Potato	0.20	0.4651	0.2163	0.07	0.0654	0.0043	0.50	0.1214	0.0147	0.20	0.1754	0.0308
Peas	0.02	0.0465	0.0022	0.05	0.0467	0.0022	0.40	0.0971	0.0094	0.08	0.0702	0.0049
Small millets	0.01	0.0233	0.0005	0.05	0.0467	0.0022	0.30	0.0728	0.0053	0.06	0.0526	0.0028
Horticultural Crops	0.11	0.2558	0.0654	0.36	0.3364	0.1132	1.55	0.3762	0.1415	0.39	0.3421	0.1170
$\sum_{1=1}^{n} Pi^2$	0.43	1	0.2969	1.07	1	0.2039	4.12	1	0.1987	1.14	1	0.1899

Note: Ai indicates actual area under each crop
Pi indicates proportionate area under each crop.
Source: Primary Probe

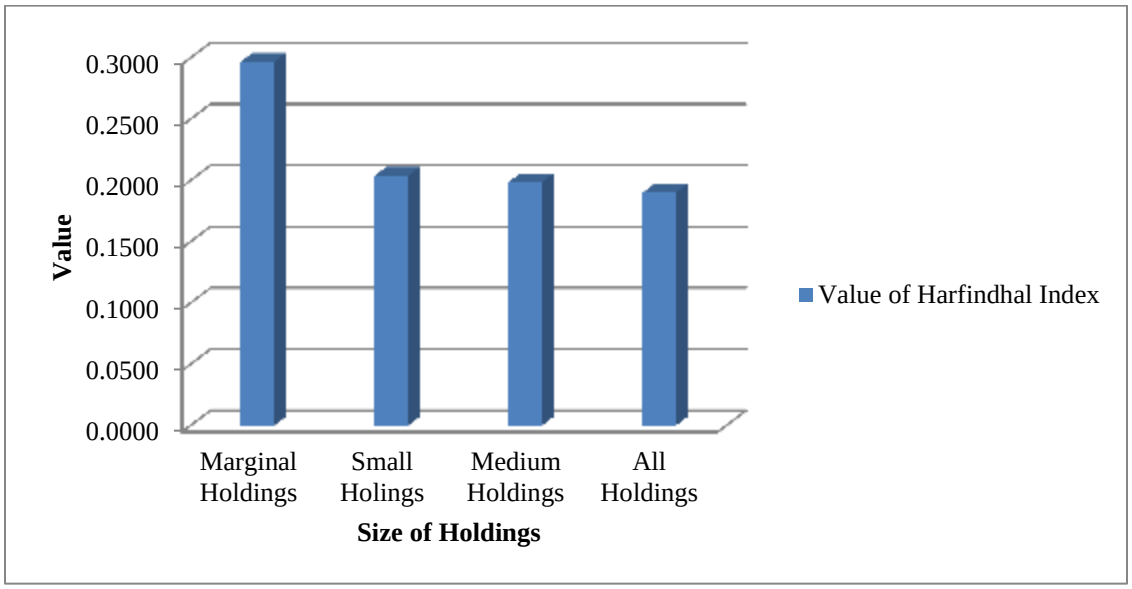

Figure: 4

The data in the table and figure depicts that the magnitude of crop diversification is comparatively less on the marginal holdings as compared to small and medium holdings.

CONCLUSIONS AND RECOMMENDATIONS

The results of examination of land use pattern showed that the average cultivated land shows an increasing tendency and uncultivated land shows a decreasing tendency with an increase in the size of holdings. Further the examination of cropping pattern revealed that the percentage area under field crops show a decreasing tendency and area under horticultural crops show increasing tendency with an increase in the size of holdings. The cropping intensity shows decreasing tendency with an increase in the size of holdings. The results further depicts that extent of crop diversification is comparatively less on smaller holdings as compared to larger of holdings. Agriculture is quite backward in tribal areas. In-fact it is mainly on account of their climatic and geographical problems. It is important to mention here that new varieties of seeds, new methods of production, new crops, and new techniques

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should be introduced in these areas. There is a need to intensify research and development activity with a view to bring about agricultural improvement specially required in the tribal areas. Tribal are simple people, not aware of modern inputs. It is important that sufficient, of training facilities in modern agricultural practices should be imparted to them.

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