



An exploratory study on farm diversification in Himachal Pradesh

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Abstract

The study was conducted in five districts viz. Una and Bilaspur representing zone I, Kangra and Mandi representing zone II and Kullu representing the Zones III and IV of Himachal Pradesh. There was a total sample of 360 respondents (72 in each district). Enterprise-wise gross income as realized by the farmers during 2012-13 formed the basis of present investigation. In all 103 sub-farming systems were identified. The maximum number of sub-farming systems was under Livestock based system (46) followed by cereals based (28), fruit based (15), vegetable based (10), other enterprises based (2) and oilseed based (1). Based on the adoption of sub-farming systems by larger number of households, the most preferred farming systems were (first two from the first four categories): Livestock + cereals (26 households), Livestock + cereals + fodder + vegetables (22 households), Cereals + livestock (28 households), Cereals + livestock + fodder + vegetables (14 households), Fruits (15 households), Fruits + livestock (14 households), Vegetables + livestock (6 households), and Vegetables + livestock + cereals (2 households). Livestock based farming systems followed by cereals based farming systems were the dominating farming systems in Zone I and II of Himachal Pradesh. In these zones 63.9 and 59.7% of the farmers were dependent on Livestock based farming systems and 33.3 and 36.8% farmers, respectively, were dependent on cereals based farming systems. In Zone III fruit growing was main activity and 72.2% of the households were dependent on fruit based farming systems. This was followed by vegetable based farming systems from which 23.6% of the households earn their livelihood. Overall fruits (36.4%) had highest share in the gross income which was followed by livestock production (28.77%), cereals (23.28%) and vegetables (8.11%).

Key words: Farming system, cereal based, livestock based, fruit based, vegetable based

Agricultural scenario in Himachal Pradesh is quite different from those of other parts of the country. It is a mountainous state with a wide agroclimatic variation in terms of rainfall, elevation and soil type. Based on agroclimatic variations, the state has been divided into four agroclimatic zones. Based on study during 2005-06, nearly 87.03% of the farmers are marginal (<1.0 ha) and small (1-2 ha) having landholding 26.67 and 25.27% (51.94%), respectively, of the total (Statistical Outlines of Himachal Pradesh, 2013). Semi-medium (9.48%) having land holding 2-4 ha and medium farmers (3.12%) having land holding 4-10 ha are possessing 24.82 and 17.04%, respectively of the total land holding. The large farmers

(>10.0 ha) which are just 0.38% (of 933383 holdings) possessing 6.2% of the total land holding (968344.7 ha). As majority of farmers are marginal and small, income from these farms cannot be raised up to the desired level to sufficiently alleviate poverty unless existing crop production systems are diversified through inclusion of high value crops (Singh 2009; Hari Om *et al.* 2008). Furthermore, increased dependence on one or two major cereal crops (wheat, rice, etc.) witnessed after the green revolution makes the farming economy vulnerable to price fluctuation arising due to demand-supply or export-import equations especially after the WTO (World Trade Organization) began influencing markets. Crop diversification on the other

hand, can better tolerate the ups and downs in the market value of farm products and may ensure economic stability for farming families. The adverse effects of aberrant weather, such as erratic and scanty rainfall and drought are very common in a vast area in agricultural production of the state. Under these aberrant weather situations, dependence on one or two major cereals (rice, wheat, etc.) is always risky. Hence, farmers have diversified their farm through substitution of one crop or mixed cropping/inter-cropping as a tool to mitigate problems associated with aberrant weather as well as to sustain their livelihood. Further livestock as is an integral component of agricultural production system is emanating as an income oriented enterprise (Hari Om et al. 2008). The present study was therefore, executed to have preliminary information about the extent of farm diversification in the state.

Materials and methods

The study was conducted in five districts viz Una and Bilaspur representing zone I, Kangra and Mandi representing zone II and Kullu representing the Zones III and IV of Himachal Pradesh. In each district two blocks were randomly selected. In each block, three villages/panchayats were randomly selected and in each village/panchayat 12 farmers representing marginal (having land holding <1.0 ha), small (1-2 ha), semi-medium (2-4 ha) and medium (>4 ha) were randomly selected. Thus there was a total sample of 360 respondents (72 in each district). Enterprise/Component-wise gross income as realized by the farmers during 2012-13 formed the basis of present investigation. The gross income was assessed on a participatory mode for the enterprises such as cereals, pulses, oilseeds, sugarcane, cotton, vegetables, fruits, spices, livestock (cow, buffaloes etc), poultry, piggery, fisheries and others (farm machinery, fodders) whichever are undertaken by the respondents. The enterprise-wise gross income so assessed was noted in a pre-tested proforma/schedule.

Results and Discussion

Six types of farming systems followed in the area based on a major system were: Livestock based, Cereal based, Fruit based, Vegetable based, Other enterprises (Fodder crops, flower crops, Machinery/power tiller and hiring of bullocks, honey bees) based and Oilseeds based. Data collected based on six farming systems are depicted in Table 1. In all 103 sub-farming systems were identified. The maximum number of sub-farming systems was

under livestock based system (46) followed by cereals based (28), fruit based (15), vegetable based (10), other enterprises based (2) and oilseed based (1). Based on the adoption of sub-farming systems by larger number of households, the most preferred farming systems (first two from the first three categories) were Livestock + cereals (26 households), Livestock + cereals + fodder + vegetables (22 households), Cereals + livestock (28 households), Cereals + livestock + fodder + vegetables (14 households), Fruits (15 households) and Fruits + livestock (14 households). Since Himachal Pradesh is a hilly region, the maximum sub-farming systems were either livestock based or involved livestock in the farming system. The number of farm households following livestock system was also highest in the study area.

As a whole importance of Livestock based farming systems in terms of contribution to farm income in the area was next only to fruit based farming systems. The share of fruit based farming system was 42.19% followed by Livestock based farming systems (31.75%), cereal based (18.98%), vegetable based (5.78%), others (1.12%) and oilseed based (0.19%). Share of six most important farming systems towards total income viz. livestock + cereals, livestock + cereals + fodder + vegetables, cereals + livestock, cereals + livestock + fodder + vegetables, fruits, fruits + livestock, vegetable + livestock and vegetable + livestock + cereals was 3.04, 3.79, 2.93, 3.49, 10.24 and 9.32, respectively. This clearly depicting that 'fruits' and 'fruits + livestock' were most important in terms of income as these two farming systems were contributing 19.56% share in total farm income in the area. Therefore, the hypothesis that the major farming system in the study area was livestock based farming system was rejected.

There were clear cut indications that fruits are more paying, followed by vegetables, livestock and the cereals and other field crops the least. Jha et al (2009) have also reported similar findings. Therefore, this is the time, policy interventions have to be geared to cereals and other field crops so that these may get major portion of government investment or farmers should be encouraged to introduce more paying enterprises.

Income base of Major Farming Systems

Farming systems were identified based on the relative share in farm income from different farm enterprises (Table 2).

Livestock based farming systems followed by cereals based farming systems were the dominating farming systems in Zone I and II of Himachal Pradesh. In these zones 63.9 and 59.7% of the farmers were dependent on

Table 1. Major Farming Systems along with important sub farming systems (adopted by at least by 5 households) of sample household in HP

Farming Systems	No of sub farming systems	No of Households					% share of total income
		Ma	S	SM	M	All	
Livestock based	46	109	52	13	6	180	31.75
Livestock +Cereals+Vegetables+Other		4	6	0	2	12	3.26
Livestock +Cereals+Other		9	0	0	0	9	1.73
Livestock +Cereals		24	2	0	0	26	3.04
Livestock		14	2	2	1	19	1.98
Livestock +Cereals+Vegetables		6	0	0	0	6	4.56
Livestock+Cereals+Other Specify+Vegetables		10	11	1	0	22	3.79
Livestock+Vegetables		2	2	1	0	5	0.80
Livestock+Cereals+Spices+Oilseeds+Pulses+Vegetables		2	3	2	0	7	1.18
Livestock+Cereals+Pulses+Oilseeds+Vegetables+spices		5	0	0	0	5	0.58
Livestock+Other		1	4	1	0	6	0.91
Cereal based	29	27	52	12	11	102	18.98
Cereals+Livestock+Vegetables+Other		2	2	1	0	5	1.17
Cereals + Livestock + Other		2	4	1	0	7	0.94
Cereals		4	1	0	0	5	0.29
Cereals+Livestock		11	13	2	2	28	2.93
Cereals+Livestock+Other +Vegetables		1	9	1	3	14	3.49
Cereals+Livestock+Oilseeds+Pulses+Vegetables+Spices		4	2	3	0	9	1.82
Fruit based	15	28	18	7	2	55	42.19
Fruits		6	7	2	0	15	10.24
Fruits +Livestock		10	3	1	0	14	9.32
Fruits+Vegetables+Livestock+Cereals		1	3	1	0	5	4.92
Vegetables based	10	13	6	0	0	19	5.78
Vegetables+Livestock		6	0	0	0	6	1.24
Vegetables+Fruits+Cereals		1	1	0	0	2	1.18
Oilseeds based	1	0	1	0	0	1	0.19
Other enterprises based	2	0	2	0	1	3	1.12
Grand Total	103	177	131	32	20	360	100.00

Ma, marginal; S, small; SM, semi-medium; M, medium

Table 2. Farm size wise number of farmers in different farming systems in the study area

Farming Systems	Category									
	Marginal		Small		Semi Medium		Medium		All Farms	
	No.	%	No.	%	No.	%	No.	%	No.	%
Low hills (Zone I)										
Livestock based	47	88.7	33	51.6	8	57.1	4	30.8	92	63.9
Cereals based	5	9.4	29	45.3	6	42.9	8	61.5	48	33.3
Fruit based	0	0.0	0	0.0	0	0.0	1	7.7	1	0.7
Vegetable based	1	1.9	1	1.6	0	0.0	0	0.0	2	1.4
Oilseeds based	0	0.0	1	1.6	0	0.0	0	0.0	1	0.7
Total	53	100.0	64	100.0	14	100.0	13	100.0	144	100.0
Mid hills (Zone II)										
Livestock based	60	73.2	19	42.2	5	45.5	2	33.3	86	59.7
Cereals based	21	25.6	23	51.1	6	54.5	3	50.0	53	36.8
Fruit based	1	1.2	1	2.2	0	0.0	1	16.7	3	2.1
Vegetable based	0	0.0	2	4.4	0	0.0	0	0.0	2	1.4
Oilseeds based	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Others	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	82	100.0	45	100.0	11	100.0	6	100.0	144	100.0
High hills (Zone III)										
Livestock based	2	5.0		0.0		0.0		0.0	2	2.8
Cereals based	1	2.5		0.0		0.0		0.0	1	1.4
Fruit based	27	67.5	17	77.3	7	100.0	1	100.0	52	72.2
Vegetable based	12	30.0	5	22.7		0.0		0.0	17	23.6
Oilseeds based		0.0		0.0		0.0		0.0		0.0
Total	42	100.0	22	100.0	7	100.0	1	100.0	72	100.0
Himachal Pradesh										
Livestock based	109	65.0	52	36.4	13	37.4	6	22.9	180	50.0
Cereals based	27	15.5	52	39.4	12	42.6	11	44.3	102	28.3
Fruit based	28	13.9	18	16.3	7	20.0	3	32.9	56	15.6
Vegetable based	13	6.6	8	7.2	0	0.0	0	0.0	21	5.8
Oilseeds based	0	0.0	1	0.8	0	0.0	0	0.0	1	0.3
Total	175	100.0	131	100.0	32	100.0	20	100.0	360	100.0

Livestock based farming systems and 33.3 and 36.8% farmers, respectively, were dependent on cereals based farming systems. In Zone III fruit growing was main activity and 72.2% of the households were dependent on fruit based farming systems. This was followed by vegetable based farming systems from which 23.6% of the households earn their livelihood. On an average, livestock based farming system was the major activity for more than 65% marginal farmers, 36% small farmers, 37% semi-medium farmers and 23% medium farmers. Cereals based farming systems was the main activity of the small (39.4%), semi-medium (42.6%) and medium farmers (44.3%). However, irrespective of the farm size, overall the livestock based farming system (50%) was the main activity followed by cereals based (28.3%), fruit based (15.6%) and vegetable based (5.8%) in that order.

A perusal of Table 3 revealed that most of the farmers of Himachal were following livestock based farming system and were earning 60% of the gross income from the system. The marginal, small, semi medium and medium farmers, respectively, were earning 68.9, 56.3, 51.3 and 39.3% of the total income from livestock based farming system. Cereals based farming system was also followed by all categories of farmers and it contributed 62.0, 58.3, 63.3 and 62.6% of total income of marginal, small, semi medium and medium farmers, respectively.

Marginal, small, semi medium and medium farmers following fruit based farming systems earned gross income of about 90, 87, 85 and 67% from fruit crops, respectively. Marginal and small farmers following vegetable based farming system were earning about their 60% of the gross income from the system.

The overall analysis clearly indicated that fruits (36.4%) had highest share in the gross income which was followed by livestock production (28.77%), cereals (23.28%) and vegetables (8.11%). Jha et al (2009) have also reported similar findings where potential of fruits and vegetables as the new source of growth was examined in terms of supply and demand side factors. There have also been studies (Joshi et al. 2007) eulogizing the role of fruits, vegetables and similar exportable crops often termed as 'high value' crops in the ongoing diversification-led growth of agriculture. Pulses (0.30%), oilseeds (0.46%), sugarcane (0.03%), spices (0.27%) and poultry (0.05%) had negligible share in gross total income. Piggery and fishery were not existed in the study area.

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Table 3. Farm size wise share in gross income of different Farming Systems in Himachal Pradesh

Particular	Farm category				
	Marginal	Small	Semimedium	Medium	All
	Livestock based				
Farm size	0.51	1.40	3.09	4.33	1.08
Cereals	23.23	35.24	38.71	49.90	31.27
Pulses	0.12	0.43	0.55	0.26	0.29
Oilseeds	0.25	0.62	0.50	0.38	0.42
Sugarcane	0.00	0.00	0.55	0.00	0.07
Vegetable	3.01	3.55	2.28	7.29	3.41
Fruit	0.46	0.14	1.50	0.00	0.44
Spices	0.28	0.50	2.68	1.03	0.70
Livestock Production	68.93	56.28	51.28	39.30	60.19
Others	3.72	3.24	1.93	1.85	3.21
Total	100.00	100.00	100.00	100.00	100.00
	Cereals based				
Farm size	0.54	1.32	2.68	4.73	1.64
Cereals	62.01	58.30	63.26	62.58	60.78
Pulses	0.36	0.36	0.47	0.25	0.36
Oilseeds	0.76	0.70	1.83	0.54	0.88
Sugarcane	0.00	0.00	0.00	0.11	0.03
Vegetable	1.00	2.58	2.22	3.99	2.56
Fruit	0.00	2.34	0.00	2.00	1.58
Spices	0.29	0.12	0.23	0.13	0.17
Livestock Production	34.15	31.75	28.89	27.18	30.39
Others	1.43	3.85	3.10	3.23	3.26
Total	100.00	100.00	100.00	100.00	100.00

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Particular	Farm category				
	Marginal	Small	Semimedium	Medium	All
Farm size	0.51	1.40	3.09	4.33	1.08
Fruit based					
Farm size	0.50	1.58	1.84	3.40	1.57
Cereals	1.59	0.71	0.96	32.76	1.85
Pulses	0.00	0.00	0.00	0.00	0.34
Oilseeds	0.01	0.00	0.00	0.00	0.03
Vegetable	3.16	8.86	12.29	0.00	6.86
Fruit	90.11	86.57	85.46	67.24	86.14
Spices	0.00	0.01	0.00	0.00	0.01
Livestock Production	4.85	3.85	1.29	0.00	4.07
Others	0.28	0.00	0.00	0.00	0.70
Total	100.00	100.00	100.00	100.00	100.00
Vegetable based					
Farm size	0.93	1.62	-	-	0.83
Cereals	3.57	7.06	-	-	5.30
Pulses	0.05	0.00	-	-	0.00
Vegetable	72.00	46.51	-	-	60.09
Fruit	9.86	33.58	-	-	20.97
Livestock Production	12.99	10.72	-	-	11.93
Others	0.00	2.12	-	-	1.72
Total	100.00	100.00	-	-	100.00
Others					
Farm size	-	1.50	-	16.00	6.33
Cereals	-	34.40	-	32.15	32.99
Oilseeds	-	0.00	-	1.48	0.93
Livestock Production	-	20.53	-	11.56	14.89
Others	-	45.07	-	32.59	37.23
Total	-	100.00	-	100.00	100.00
Oilseeds based					
Farm size	-	1.6	-	-	1.6
Oilseeds	-	71.04	-	-	71.04
Vegetable	-	1.68	-	-	1.68
Livestock Production	-	24.20	-	-	24.20
Others	-	3.08	-	-	3.08
Total	-	100.00	-	-	100.00
All Farm					
Farm size	0.54	1.39	2.66	5.04	1.34
Cereals	14.80	24.29	28.63	54.38	23.28
Pulses	0.39	0.21	0.30	0.21	0.30
Oilseeds	0.16	0.67	0.61	0.55	0.46
Sugarcane	0.00	0.00	0.18	0.06	0.03
Vegetable	2.68	8.38	6.54	6.41	8.11
Fruit	44.03	37.80	36.97	5.12	36.40
Spices	1.00	0.18	0.93	0.36	0.27
Livestock Production	33.90	26.37	24.43	27.43	28.77
Poultry production	1.13	0.11	0.00	0.00	0.05
Others	1.81	2.43	1.40	5.47	2.51
Total	100.00	100.00	100.00	100.00	100.00

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