

ORIGINAL ARTICLE

**Socio-economic and Demographic study of various Farmers families in Subtropical region of Himachal Pradesh, India**

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ABSTRACT

*The study was conducted at Bilaspur and Hamirpur district of Himachal Pradesh in 2014-2015 to determine the family structure, sex ratio, literacy and landholding capacity of the farmers. Each district was divided into three altitudinal zones based on altitude namely zone I (400-600 m), zone II (600-800 m) and zone III (800-1000m), and in each altitudinal zone, four farmers category were made based on land holding size, viz., marginal, small, medium and large. Ten farmers from each farmer category were selected for final collection of data. The study revealed that average family size among the selected altitudes in Bilaspur district was maximum in zone II (7.67 no.) while minimum was recorded in zone III (6.77 no.). In Hamirpur district highest average family size was recorded in zone I (6.58 no.) on the other hand lowest was in zone III (5.97 no.). The literacy percent among three altitudinal zones of Bilaspur district was noticed maximum in zone II (96.92%) while lowest was noticed in zone III (92.54%). In Hamirpur district higher literacy was noticed in zone I (97.76%) while lowest literacy was recorded in zone III (91.54%). Sex ratio of Bilaspur district was reported to be highest in zone III (0.94) while lowest was in zone I (0.79). In Hamirpur district maximum sex ratio (0.93) was recorded in zone I and zone II while minimum was in zone III (0.74). This study concluded that highest average family structure and female to male sex ratio was observed in Bilaspur district while higher literacy per cent was observed in Hamirpur District.*

**Key words:** Altitudinal zone, education, family size, farmers, sex ratio

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**INTRODUCTION**

Farmers are the backbone of the nation, without them agricultural production would not be possible. In India there are various categories of farmer based on land holding viz., marginal (<1ha), small (1-2 ha), medium (2-4 ha), large (>4ha), and their share in landholding is 67 per cent, 18 per cent, 14 per cent and 1 per cent respectively [8]. In 2007-08, agriculture accounted for 17.8 percent of India's Gross National Product (GNP) while 70.0 percent of India's workforce was reported to be engaged in farming [1]. Farmers play important role in production of agricultural produce and in order to obtain maximum crop production, they have started adopting new technologies, crop varieties and new agricultural implements. Farmers have also adopted improved farming practices such as agroforestry for economic gain which have a positive effect on their livelihood. However adoption of such improved practices is influenced by different socioeconomic factors such as landholding size, livestock population, gender and the relative importance of agriculture in household [5]. Income is one of the important yardsticks measuring the economic conditions of the farm households. The higher the level of income, the better is the living standard of the farm household. Economic status of the farm households depends upon the land holding capacity of the cultivators. Higher landholding is the indicator of better socio-economic status and standard of living. The basic idea behind the study of assets structure of the farm households across farm size is to know which category of farm is investing more on financial investment, farm equipment, household durable, house and land. Besides it will also indicate the employing capacity of the individual

farmer [10]. With this background the present study was conducted to assess the socio-economic status and demography of various farming families of Sub-tropical region of Himachal Pradesh.

## MATERIALS AND METHODS

The study was conducted during the year 2014-2015 in Bilaspur and Hamirpur districts of Himachal Pradesh. In the first step each district was divided into three altitudinal zones viz., altitudinal zone I (400-600m amsl), altitudinal zone II (600-800m amsl) and altitudinal zone III (800-1000m amsl) with the help of GPS. In each altitudinal zone, a complete list of cultivars/ farmers was prepared along with their operational land holding size and total farmers were categorized into four categories i.e marginal (<1ha), small (1-2 ha), medium (2-4 ha) and large (>4 ha), then finally ten farmers from each category were selected for study. The information was collected from each household through well prepared semi-structured questionnaire format by multistage sampling technique having sample size of 222. The dependency ratio was determined by considering <15 years and >60 years household members as dependents and 15-60 year age members as actively working [6].

Dependency ratio with respect to workers =  $\frac{\text{No. of dependent in a family}}{\text{Total workers}}$

## RESULTS AND DISCUSSION

The findings of the study on family structure, literacy percent, sex ratio and land holdings are described under following heads and subheads.

**Table 1. Family structure in various categories of farmers in different altitudinal zones of Bilaspur district**

Famers category	< 5 year	5-18 year	19-40 year	>40 year	Total	Average
<b>Altitudinal zone -I</b>						
Marginal	3 (4.91)	10 (16.39)	24 (39.34)	24 (39.34)	61 (100.00)	6.10
Small	4 (7.40)	9 (16.66)	19 (35.18)	22 (40.74)	54 (100.00)	5.40
Medium	3 (3.44)	5 (5.74)	34 (39.08)	45 (51.72)	87 (100.00)	8.70
Large	3 (6.97)	2 (4.65)	18 (41.86)	20 (46.51)	43 (100.00)	10.75
<b>Total</b>	<b>13 (5.30)</b>	<b>26 (10.61)</b>	<b>95 (38.77)</b>	<b>111 (45.30)</b>	<b>245 (100.00)</b>	<b>7.20</b>
<b>Altitudinal zone -II</b>						
Marginal	7 (12.72)	9 (16.36)	23 (41.81)	16 (29.09)	55 (100.00)	5.5
Small	4 (6.25)	7 (10.93)	27 (42.18)	26 (40.62)	64 (100.00)	6.4
Medium	3 (4.47)	10 (14.92)	27 (40.29)	27 (40.29)	67 (100.00)	6.7
Large	5 (4.13)	25 (20.66)	49 (40.49)	42 (34.71)	121 (100.00)	12.1
<b>Total</b>	<b>19 (6.18)</b>	<b>51 (16.61)</b>	<b>126 (41.04)</b>	<b>111 (36.15)</b>	<b>307 (100.00)</b>	<b>7.67</b>
<b>Altitudinal zone -III</b>						
Marginal	4 (4.81)	26 (31.32)	29 (34.93)	24 (28.90)	83 (100.00)	8.30
Small	0 (0.00)	11 (20.75)	18 (33.96)	24 (45.28)	53 (100.00)	5.30
Medium	2 (3.03)	15 (22.72)	26 (39.39)	23 (34.84)	66 (100.00)	6.60
Large	5 (6.94)	11 (15.27)	31 (43.05)	25 (34.72)	72 (100.00)	7.20
<b>Total</b>	<b>11 (4.05)</b>	<b>60 (22.14)</b>	<b>102 (37.63)</b>	<b>98 (36.16)</b>	<b>271 (100.00)</b>	<b>6.77</b>

**Table 2. Family structure in various categories of farmers in different altitudinal zones of Hamirpur district**

Famers category	< 5 year	5-18 year	19-40 year	>40 year	Total	Average
<b>Altitudinal zone -I</b>						
Marginal	2 (4.54)	4 (9.09)	18 (40.90)	20 (45.45)	44 (100.00)	4.40
Small	4 (6.15)	13 (20.00)	27 (41.53)	21 (32.30)	65 (100.00)	6.50
Medium	8 (10.52)	2 (2.63)	34 (44.73)	32 (42.10)	76 (100.00)	7.60
Large	2 (3.84)	6 (11.53)	24 (46.15)	20 (38.46)	52 (100.00)	8.67
<b>Total</b>	<b>16 (6.75)</b>	<b>25 (10.54)</b>	<b>103 (43.45)</b>	<b>93 (39.24)</b>	<b>237 (100.00)</b>	<b>6.58</b>
<b>Altitudinal zone -II</b>						
Marginal	4 (6.15)	12 (18.46)	23 (35.38)	26 (40.00)	65 (100.00)	6.50
Small	0 (0.00)	11 (17.74)	24 (38.70)	27 (43.54)	62 (100.00)	6.20
Medium	3 (4.47)	13 (19.40)	24 (35.82)	27 (40.29)	67 (100.00)	6.70
Large	3 (5.66)	7 (13.20)	21 (39.62)	22 (41.50)	53 (100.00)	6.62
<b>Total</b>	<b>10 (4.04)</b>	<b>43 (17.40)</b>	<b>92 (37.24)</b>	<b>102 (41.29)</b>	<b>247 (100.00)</b>	<b>6.50</b>
<b>Altitudinal zone -III</b>						
Marginal	1 (2.08)	10 (20.83)	18 (37.50)	19 (39.58)	48 (100.00)	4.80
Small	2 (3.12)	6 (9.37)	28 (43.75)	28 (43.75)	64 (100.00)	6.40
Medium	1 (1.63)	8 (13.11)	24 (39.34)	28 (45.90)	61 (100.00)	6.10
Large	0 (0.00)	8 (25.00)	8 (25.00)	16 (50.00)	32 (100.00)	8.00
<b>Total</b>	<b>4 (1.97)</b>	<b>32 (15.76)</b>	<b>78 (38.42)</b>	<b>89 (43.84)</b>	<b>203 (100.00)</b>	<b>5.97</b>

\* Figures in parenthesis are percentage

**Family Structure (Number of members)**

Family structure represents the number of individuals in a household comprising of <5 year, 5-18 year, 19-40 year and >40 year old population group. Family structure of altitudinal zone -1 in Bilaspur district revealed that average family size in marginal, small, medium and large categories of farmers was 6.10, 5.40, 8.70 and 10.75 respectively. The average family size was observed maximum in large farmers (10.75), while minimum was noticed in small farmers (5.40). Among different age groups highest population was recorded in > 40 years (111) on the other hand minimum was in <5 years (13), while the overall average was noticed to be 7.20 (Table 1). In altitudinal zone II, highest population was in 19-40 year age group (126) and percentage of population was 41.04 per cent while minimum was found in < 5 year age group (19). The average population among four farmer categories was noticed maximum in large farmers (12.1) on the other hand minimum was recorded in marginal farmers (5.5). However, overall average for all farmer categories was observed to be 7.67. In altitude zone III of Bilaspur district total population was recorded to be 271, while average population was recorded 6.77. Among four farmer categories, maximum population was observed in marginal farmer category (8.30) on the other hand minimum was recorded in small farmer category (5.30). In different age groups, highest population was noticed in 19-40 years age group (102) while lowest was noticed in < 5 years (11). However, among three altitudinal zones maximum total population was recorded in zone II (307) while minimum was recorded in zone I (245).

Data recorded and presented in the table 2 depicts family structure of Hamirpur district. Among three altitude zones, maximum family size was reported in zone I large farmers (8.67) followed by zone III large farmers (8.00), while minimum was found in altitude zone I marginal farmers (4.40). In different age groups among all the three zones highest number of population was recorded in 19-40 year group in zone I (103) while minimum was recorded in zone III with <5 year group (4). However, zone II recorded highest population (247) among the three altitudinal zones in this district.

Current study clearly revealed that most of the population was middle aged working group, which indicate a rising trend towards high economic motivation. This can be attributed to the fact that age is an influencing and important factor in the economic motivation of individuals and as age increases, their needs and requirements also increase, which motivates them to earn more and become economically sound. Similar findings were reported by Singh and Sohal [14].

**Distribution of actively working and their dependent ratio of families in Bilaspur and Hamirpur Districts**

Observation from the table 3 showed that among the three altitudinal zones, higher dependency ratio was noticed in zone III (0.37), which was followed by zone II (0.30). Whereas, lowest was recorded in zone I (0.21). In four farmers category and three altitudinal zones highest dependency ratio was recorded in marginal farmers from zone III (0.57) while lowest was recorded in medium farmers from zone I (0.10). Data indicated that zone I has less dependency as compared to zone II and zone III.

**Table3. Distribution of actively working and their dependents in the family of Bilaspur**

<b>Bilaspur district, altitudinal zone -I</b>				
<b>Farmers category</b>	<b>Average no of dependents</b>	<b>Average no of workers</b>	<b>Average family size (number)</b>	<b>Dependency ration w.r.t workers</b>
Marginal	1.3 (21.3)	4.8 (78.7)	6.1 (100)	0.27
Small	1.3 (24.1)	4.1 (75.9)	5.4 (100)	0.32
Medium	0.8 (9.2)	7.9 (90.8)	8.7 (100)	0.10
Large	1.25 (11.6)	9.5 (88.4)	10.8 (100)	0.13
Overall	1.16 (16.45)	6.58(83.45)	7.74 (100)	0.21
<b>Bilaspur district, altitudinal zone -II</b>				
Marginal	1.6 (29.1)	3.9 (70.9)	5.5 (100)	0.41
Small	1.1 (17.2)	5.3 (82.8)	6.4 (100)	0.21
Medium	1.3 (19.4)	5.4 (80.6)	6.7 (100)	0.24
Large	3 (24.8)	9.1 (75.2)	12.1 (100)	0.33
Overall	1.75(22.62)	5.93 (77.38)	7.68 (100)	0.30
<b>Bilaspur district, altitudinal zone -III</b>				
Marginal	3.0(36.1)	5.3 (63.9)	8.3 (100)	0.57
Small	1.1(20.8)	4.2 (79.2)	5.3(100)	0.26
Medium	1.7 (25.8)	4.9 (74.2)	6.6(100)	0.35
Large	1.6 (22.2)	5.6 (77.8)	7.2(100)	0.29
Overall	1.85 (26.22)	5.00 (73.78)	6.85(100)	0.37

**Table 4. Distribution of actively working and their dependents in the family of Hamirpur**

Hamirpur district, altitudinal zone -I				
Farmers category	Average no of dependents	Average no of workers	Average family size (number)	Dependency ration w.r.t workers
Marginal	0.6 (13.6)	3.8 (86.4)	4.4 (100)	0.16
Small	1.7 (26.2)	4.8 (73.8)	6.5 (100)	0.35
Medium	1.0 (13.2)	6.6 (86.8)	7.6 (100)	0.15
Large	1.33 (15.4)	7.33 (84.6)	8.7 (100)	0.18
Overall	1.16 (17.08)	5.63 (82.92)	6.79 (100)	0.21
Hamirpur district, altitudinal zone -II				
Marginal	1.6 (24.6)	4.9 (75.4)	6.5 (100)	0.33
Small	1.1 (17.7)	5.1 (82.3)	6.2 (100)	0.22
Medium	1.6 (23.9)	5.1 (76.1)	6.7 (100)	0.31
Large	1.25 (18.9)	5.37(81.1)	6.6 (100)	0.23
Overall	1.39 (21.28)	5.12 (78.72)	6.51 (100)	0.27
Hamirpur district, altitudinal zone -III				
Marginal	1.1 (22.9)	3.7 (77.1)	4.8 (100)	0.30
Small	0.8 (12.5)	5.6 (87.5)	6.4 (100)	0.14
Medium	0.9 (14.8)	5.2 (85.2)	6.1 (100)	0.17
Large	2.0 (25.0)	6.0 (75.0)	8.0 (100)	0.33
Overall	1.20 (18.79)	5.13 (81.21)	6.33 (100)	0.24

Figures in the parentheses indicate percentage

Data presented in the table 4 indicated that among three altitudinal zones of Hamirpur district maximum dependency ratio was recorded in zone II (0.27), while minimum was recorded in zone I (0.21). Whereas, among four farmer categories highest dependency ratio was noticed in zone I small farmers (0.35), while lowest was recorded in small farmers from zone III (0.14). The above data revealed that zone I displayed lower dependency in comparison to zone III and II.

Lower dependency ratio indicated better socioeconomic condition of farming families [9]. Hence, it is clear from table 3 and 4 that farmer families from zone I of both the districts in present investigation were having better socioeconomic conditions than their counterparts from other two zones.

#### **Study of literacy per cent in farming families**

Data recorded and presented in the table 5 reveals that in Bilaspur district among the three altitude zones and four farmer categories highest literacy per cent was reported in zone I marginal farmers (100%) which was followed by zone II large farmers (99.15%) on the other hand lowest literacy was noticed in zone III small farmers (86.79%). Literacy rate among different altitudinal zones was observed maximum in zone II (96.92%) while minimum was recorded in zone III (92.53%).

It is clear from data presented in table 6 that in Hamirpur district highest literacy per cent among three altitudinal zones was recorded in altitudinal zone I (97.76%) while lowest was recorded in zone III (91.54%). In interaction between altitude zones and farmer categories, higher literacy per cent was noticed in zone I large farmers and zone II marginal farmers (100%) on the other hand lowest was recorded in zone III large farmers (87.50%).

Data from the Table 5 and 6 revealed that lower altitudinal zone exhibited higher literacy as compared to higher altitudinal zone in both the districts. Higher literacy per cent indicated that people are much aware of need of education in day to day life. Literacy status of farming families was studied keeping in view that literate farmers considered being more aware of modern farming practices are better manager of his/her farm, similar findings were also noticed by Rai *et al.* [12]. Higher literacy was also stated by the Himachal Pradesh Human Development Report [7]. The farming families in the study area were noticed moderately aware of modern farming practices and also they were adopting modern techniques like use of high yielding varieties of maize, wheat, application of fertilizers, pesticides, mechanized harvesting etc.

#### **Male female ratio**

Sex ratio is the number of females per 1000 males. The data in Table 7 and 8 demonstrates male and female population sex ratio for Bilaspur and Hamirpur districts, the values in the ratio are expressed as females per male population.

#### **Bilaspur District**

Data from the table 7 indicated sex ratio of different farmer categories and altitudinal zones, it was observed to be better in zone I marginal farmers (1.03) and zone II large farmers (0.98). Poor sex ratio was noticed in zone I large farmers (0.65). Sex ratio in the three altitudinal zones was recorded, viz., 0.79,

0.90 and 0.94 in zone I, zone II and zone III respectively. The result indicated that sex ratio improved with increasing altitude.

**Table 5. Educational status of various categories of farmers family in different altitudinal zones of Bilaspur district**

Famers category	Primary (P)	Middle (M)	High school (H)	Graduation (D)	Post Graduate (PG)	Illiterate (I)	Literate	Total	Literacy %
<b>Altitudinal zone -I</b>									
Marginal	8 (13.11)	12 (19.67)	16 (26.22)	12 (19.67)	13 (21.31)	0 (0.00)	61 (100.00)	61	<b>100.00</b>
Small	7 (13.46)	8 (15.38)	22 (42.30)	9 (17.30)	3 (5.76)	3 (5.76)	49 (94.23)	52	<b>94.23</b>
Medium	7 (8.53)	15 (18.29)	36 (43.90)	15 (18.29)	1 (1.21)	8 (9.75)	74 (90.24)	82	<b>90.24</b>
Large	2 (5.00)	4 (10.00)	20 (50.00)	11 (27.50)	1 (2.50)	2 (5.00)	38 (95.00)	40	<b>95.00</b>
<b>Total</b>	<b>24 (10.21)</b>	<b>39 (16.59)</b>	<b>94 (40.00)</b>	<b>47 (20.00)</b>	<b>18 (7.65)</b>	<b>13 (5.53)</b>	<b>222 (94.47)</b>	<b>235</b>	<b>94.47</b>
<b>Altitudinal zone -II</b>									
Marginal	9 (18.36)	7 (14.28)	21 (42.85)	9 (18.36)	1 (2.04)	2 (4.08)	47 (95.92)	49	<b>95.92</b>
Small	6 (9.67)	4 (6.45)	30 (48.38)	12 (19.35)	6 (9.67)	4 (6.45)	58 (93.55)	62	<b>93.55</b>
Medium	7 (10.93)	14 (21.87)	25 (39.06)	13 (20.31)	3 (4.68)	2 (3.12)	62 (96.88)	64	<b>96.88</b>
Large	15 (12.82)	10 (8.54)	41 (35.04)	36 (30.76)	14 (11.96)	1 (0.85)	116 (99.15)	117	<b>99.15</b>
<b>Total</b>	<b>37 (12.67)</b>	<b>35 (11.98)</b>	<b>117 (40.06)</b>	<b>70 (23.97)</b>	<b>24 (8.21)</b>	<b>9 (3.08)</b>	<b>283 (96.92)</b>	<b>292</b>	<b>96.92</b>
<b>Altitudinal zone -III</b>									
Marginal	18 (23.07)	4 (5.12)	28 (35.89)	11 (14.10)	13 (16.66)	4 (5.12)	74 (94.87)	78	<b>94.87</b>
Small	6 (11.32)	4 (7.54)	26 (49.05)	9 (16.98)	1 (1.88)	7 (13.20)	46 (86.79)	53	<b>86.79</b>
Medium	11 (17.46)	4 (6.34)	30 (47.61)	9 (14.28)	4 (6.34)	5 (7.93)	58 (92.06)	63	<b>92.06</b>
Large	15 (21.73)	7 (10.14)	25 (36.23)	14 (20.28)	3 (4.34)	5 (7.24)	64 (92.75)	69	<b>92.75</b>
<b>Total</b>	<b>50 (18.65)</b>	<b>19 (7.08)</b>	<b>109 (40.67)</b>	<b>49 (18.28)</b>	<b>21 (7.83)</b>	<b>20 (7.46)</b>	<b>248 (92.54)</b>	<b>268</b>	<b>92.54</b>

**Table 6. Educational status of various categories of farmers family in different altitudinal zones of Hamirpur district**

Famers category	Primary (P)	Middle (M)	High school (H)	Graduation (D)	Post Graduate (PG)	Illiterate (I)	Literate	Total	Literacy %
<b>Altitudinal zone -I</b>									
Marginal	2 (4.76)	5 (11.90)	20 (47.61)	7 (16.66)	7 (16.66)	1 (2.38)	41 (97.62)	42	<b>97.62</b>
Small	11 (18.03)	3 (4.91)	20 (32.78)	14 (22.95)	12 (19.67)	1 (1.63)	60 (98.36)	61	<b>98.36</b>
Medium	7 (10.00)	8 (11.42)	29 (41.42)	20 (28.57)	3 (4.28)	3 (4.28)	67 (95.71)	70	<b>95.71</b>
Large	6 (12.00)	3 (6.00)	23 (46.00)	12 (24.00)	6 (12.00)	0 (0.00)	50 (100.00)	50	<b>100.00</b>
<b>Total</b>	<b>26 (11.65)</b>	<b>19 (8.52)</b>	<b>92 (41.25)</b>	<b>53 (23.76)</b>	<b>28 (12.55)</b>	<b>5 (2.24)</b>	<b>218 (97.76)</b>	<b>223</b>	<b>97.76</b>
<b>Altitudinal zone -II</b>									
Marginal	9 (14.28)	5 (7.93)	31 (49.20)	10 (15.87)	8 (12.69)	0 (0.00)	63 (100.00)	63	<b>100.00</b>
Small	8 (13.11)	3 (4.91)	25 (40.98)	13 (21.31)	9 (14.75)	3 (4.91)	58 (95.08)	61	<b>95.08</b>
Medium	8 (12.30)	8 (12.30)	28 (43.07)	9 (13.84)	6 (9.23)	6 (9.23)	59 (90.77)	65	<b>90.77</b>
Large	4 (8.00)	4 (8.00)	16 (32.00)	15 (30.00)	9 (18.00)	2 (4.00)	48 (96.00)	50	<b>96.00</b>
<b>Total</b>	<b>29 (12.13)</b>	<b>20 (8.36)</b>	<b>100 (41.84)</b>	<b>47 (19.66)</b>	<b>32 (13.38)</b>	<b>11 (4.60)</b>	<b>228 (95.40)</b>	<b>239</b>	<b>95.40</b>

Altitudinal zone -III									
Marginal	13 (27.65)	6 (12.76)	11 (23.40)	12 (25.53)	2 (4.25)	3 (6.38)	44 (93.62)	47	93.62
Small	8 (13.11)	9 (14.75)	21 (34.42)	14 (22.95)	3 (4.91)	6 (9.83)	55 (90.16)	61	90.16
Medium	6 (10.00)	11 (18.33)	21 (35.00)	17 (28.33)	1 (1.66)	4 (6.66)	56 (93.33)	60	93.33
Large	7 (21.87)	11 (34.37)	2 (6.25)	8 (25.00)	0 (0.00)	4 (12.50)	28 (87.50)	32	87.50
<b>Total</b>	<b>34 (16.91)</b>	<b>38 (18.90)</b>	<b>55 (27.36)</b>	<b>51 (25.37)</b>	<b>6 (2.98)</b>	<b>17 (8.45)</b>	<b>184 (91.54)</b>	<b>201</b>	<b>91.54</b>

\* Figures in parenthesis are percentage

**Table 7. Female to Male ratio of various categories of farmer's families in different altitudinal zones of Bilaspur district**

Farmers category	< 18 year			18-40 year			>40 year			Total		
	Male	Female	M:F ratio	Male	Female	M:F ratio	Male	Female	M:F ratio	Total Male	Total Female	M: F ratio
Altitudinal zone -I												
Marginal	6 (9.83)	5 (8.19)	0.83	10 (16.39)	14 (22.95)	1.40	14 (22.95)	12 (19.67)	0.857	30	31	1.03
Small	9 (16.66)	5 (9.25)	0.56	11 (20.37)	8 (14.81)	0.73	10 (18.51)	11 (20.37)	1.100	30	24	0.80
Medium	5 (5.74)	3 (3.44)	0.60	24 (27.58)	13 (14.94)	0.54	22 (25.28)	20 (22.98)	0.909	51	36	0.71
Large	3 (6.97)	1 (2.32)	0.33	12 (27.90)	7 (16.27)	0.58	11 (25.58)	9 (20.93)	0.818	26	17	0.65
<b>Total</b>	<b>23 (9.38)</b>	<b>14 (5.71)</b>	<b>0.61</b>	<b>57 (23.26)</b>	<b>42 (17.14)</b>	<b>0.74</b>	<b>57 (23.26)</b>	<b>52 (21.22)</b>	<b>0.912</b>	<b>137</b>	<b>108</b>	<b>0.79</b>
Altitudinal zone -II												
Marginal	6 (10.90)	8 (14.54)	1.33	13 (23.63)	11(20.00)	0.85	7 (12.97)	10 (18.18)	1.43	26	29	1.12
Small	7 (10.93)	3 (4.68)	0.43	16 (25.00)	13 (20.31)	0.81	13 (20.31)	12 (18.75)	0.92	36	28	0.78
Medium	11 (16.41)	2 (2.98)	0.18	13 (19.40)	13 (19.40)	1.00	15 (22.38)	13 (19.40)	0.87	39	28	0.72
Large	12 (9.91)	11 (9.09)	0.92	28 (23.14)	27 (22.31)	0.96	21 (17.35)	22 (18.18)	1.05	61	60	0.98
<b>Total</b>	<b>36 (11.72)</b>	<b>24 (7.81)</b>	<b>0.67</b>	<b>70 (22.80)</b>	<b>64 (20.84)</b>	<b>0.91</b>	<b>56 (18.24)</b>	<b>57 (18.56)</b>	<b>1.02</b>	<b>162</b>	<b>145</b>	<b>0.90</b>
Altitudinal zone -III												
Marginal	17 (20.48)	10 (12.04)	0.59	17 (20.48)	15 (18.07)	0.88	11 (13.25)	13 (15.66)	1.18	45	38	0.84
Small	5 (9.43)	6 (11.32)	1.20	7 (13.20)	12 (22.64)	1.71	11 (20.75)	12 (22.64)	1.09	23	30	1.30
Medium	8 (12.12)	8 (12.12)	1.00	16 (24.24)	12 (18.18)	0.75	12 (18.18)	10 (15.15)	0.83	36	30	0.83
Large	8 (11.11)	7 (9.72)	0.88	17 (23.61)	16 (22.22)	0.94	12 (16.66)	12 (16.66)	1.00	37	35	0.95
<b>Total</b>	<b>38 (14.02)</b>	<b>31 (11.43)</b>	<b>0.82</b>	<b>57 (21.03)</b>	<b>55 (20.29)</b>	<b>0.96</b>	<b>46 (16.97)</b>	<b>47 (17.34)</b>	<b>1.02</b>	<b>141</b>	<b>133</b>	<b>0.94</b>

**Table 8. Female to Male ratio of various categories of farmers families in different altitudinal zones of Hamirpur district**

Farmers category	< 18 year			18-40 year			>40 year			TOTAL		
	Male	Female	M:F ratio	Male	Female	M:F ratio	Male	Female	M:F ratio	Male	Female	M:F ratio
Altitudinal zone -I												
Marginal	3 (6.81)	2 (4.54)	0.67	10 (22.72)	10 (22.72)	1.00	9 (20.45)	10 (22.72)	1.11	22	22	1.00
Small	8 (12.30)	8 (12.30)	1.00	13 (20.00)	15 (23.07)	1.15	10 (15.38)	11 (16.92)	1.10	31	34	1.10
Medium	6 (7.89)	5 (6.57)	0.83	22 (28.94)	14 (18.42)	0.64	15 (19.73)	16 (21.05)	1.07	43	35	0.81
Large	4 (7.69)	4 (7.69)	1.00	15 (28.84)	11 (21.15)	0.73	9 (17.30)	9 (17.30)	1.00	28	24	0.86
<b>Total</b>	<b>21 (8.86)</b>	<b>19 (8.01)</b>	<b>0.90</b>	<b>60 (25.31)</b>	<b>50 (21.09)</b>	<b>0.83</b>	<b>43 (18.14)</b>	<b>46 (19.40)</b>	<b>1.07</b>	<b>124</b>	<b>115</b>	<b>0.93</b>
Altitudinal zone -II												

Marginal	10 (15.38)	5 (7.69)	0.50	11 (16.92)	15 (23.07)	1.36	10 (15.38)	14 (21.53)	1.40	31	34	<b>1.10</b>
Small	9 (14.51)	1 (1.61)	0.11	10 (16.12)	13 (20.96)	1.30	17 (27.41)	12 (19.35)	0.71	36	26	<b>0.72</b>
Medium	8 (11.94)	7 (10.44)	0.88	14 (20.89)	12 (17.91)	0.86	13 (19.40)	13 (19.40)	1.00	35	32	<b>0.91</b>
Large	4 (7.54)	6 (11.32)	1.50	9 (16.98)	12 (22.64)	1.33	13 (24.52)	9 (16.98)	0.69	26	27	<b>1.04</b>
<b>Total</b>	<b>31 (12.55)</b>	<b>19 (7.69)</b>	<b>0.61</b>	<b>44 (17.81)</b>	<b>52 (20.64)</b>	<b>1.18</b>	<b>53 (21.45)</b>	<b>48 (19.43)</b>	<b>0.91</b>	<b>128</b>	<b>119</b>	<b>0.93</b>
<b>Altitudinal zone -III</b>												
Marginal	6 (12.50)	3 (6.25)	0.50	11 (22.91)	8 (16.66)	0.73	10 (20.83)	10 (20.83)	1.00	27	21	<b>0.78</b>
Small	7 (10.93)	0 (0.00)	0.00	20 (31.25)	10 (15.62)	0.50	13 (20.31)	14 (21.87)	1.08	40	24	<b>0.60</b>
Medium	5 (8.19)	3 (4.91)	0.60	16 (26.22)	10 (16.39)	0.63	14 (22.95)	13 (21.31)	0.93	35	26	<b>0.74</b>
Large	4 (12.50)	5 (15.62)	1.25	4 (12.50)	5 (15.62)	1.25	9 (28.12)	7 (21.87)	0.78	17	17	<b>1.00</b>
<b>Total</b>	<b>22 (10.83)</b>	<b>11 (5.41)</b>	<b>0.50</b>	<b>51 (25.12)</b>	<b>33 (16.25)</b>	<b>0.65</b>	<b>46 (22.66)</b>	<b>44 (21.67)</b>	<b>0.96</b>	<b>119</b>	<b>88</b>	<b>0.74</b>

\* Figures in parenthesis are percentage

**Table 9. Land use statistics per household in different altitudinal zones of Bilaspur and Hamirpur district**

Farmers category	Agricultural land (ha)	Pasture land (ha)	Total (ha)	Average land holding (ha)
<b>Bilaspur Altitude Zone I</b>				
<b>Marginal</b>	0.38 (65.75)	0.2 (34.24)	5.84	0.58
<b>Small</b>	0.80 (56.81)	0.60 (43.18)	14.08	1.40
<b>Medium</b>	1.61 (61.54)	1.00 (38.22)	26.16	2.61
<b>Large</b>	2.28 (50.66)	2.22 (49.33)	18.00	4.50
<b>Total</b>	<b>5.07</b>	<b>4.02</b>	<b>64.08</b>	<b>9.09</b>
<b>Bilaspur Altitude Zone II</b>				
<b>Marginal</b>	0.29 (75.51)	0.09 (24.48)	3.92	0.39
<b>Small</b>	0.75 (65.73)	0.39 (43.26)	11.44	1.14
<b>Medium</b>	1.34 (53.17)	1.17 (46.42)	25.20	2.52
<b>Large</b>	2.76 (51.56)	2.59 (48.39)	53.52	5.35
<b>Total</b>	<b>5.14</b>	<b>4.24</b>	<b>94.08</b>	<b>9.4</b>
<b>Bilaspur Altitude Zone III</b>				
<b>Marginal</b>	0.31 (60.93)	0.2 (39.06)	5.12	0.51
<b>Small</b>	0.92 (54.24)	0.77 (45.40)	16.96	1.69
<b>Medium</b>	1.48 (51.82)	1.37 (47.96)	28.56	2.85
<b>Large</b>	3.03 (58.26)	2.16 (41.33)	52.00	5.20
<b>Total</b>	<b>5.74</b>	<b>4.5</b>	<b>102.64</b>	<b>10.25</b>
<b>Hamirpur Altitude Zone I</b>				
<b>Marginal</b>	0.31 (58.71)	0.21 (39.77)	5.28	0.52
<b>Small</b>	0.78 (65.00)	0.41 (34.16)	12.00	1.20
<b>Medium</b>	1.45 (59.42)	0.98 (40.16)	24.40	2.44
<b>Large</b>	1.84 (44.01)	2.34 (55.98)	25.08	4.18
<b>Total</b>	<b>4.38</b>	<b>3.94</b>	<b>66.76</b>	<b>8.34</b>
<b>Hamirpur Altitude Zone II</b>				
<b>Marginal</b>	0.24 (58.25)	0.17 (41.26)	4.12	0.41
<b>Small</b>	0.57 (51.98)	0.53 (48.01)	11.08	1.10
<b>Medium</b>	1.00 (44.09)	1.26 (55.90)	22.68	2.26
<b>Large</b>	2.00 (42.37)	2.72 (57.62)	37.76	6.29
<b>Total</b>	<b>3.81</b>	<b>4.68</b>	<b>75.64</b>	<b>10.06</b>
<b>Hamirpur Altitude Zone III</b>				
<b>Marginal</b>	0.27 (68.89)	0.12 (30.61)	3.92	0.39
<b>Small</b>	0.92 (66.47)	0.45 (32.51)	13.84	1.38
<b>Medium</b>	1.42 (56.34)	1.10 (43.65)	25.20	2.52
<b>Large</b>	0.83 (47.05)	0.92 (52.15)	17.64	4.41
<b>Total</b>	<b>3.44</b>	<b>2.59</b>	<b>60.6</b>	<b>8.7</b>

\* Figures in parenthesis are percentage

### Hamirpur district

In Hamirpur district (table 8) sex ratio was recorded higher (1.10) in small farmers from zone I and in marginal farmers from zone II whereas, lower was recorded in small farmers in zone III (0.60). Among three altitudinal zones, highest sex ratio was observed in zone I and II (0.93) on the other hand lowest was in zone III (0.74). In this district sex ratio was observed to decrease as altitude increased.

The gender imbalance noticed in present study might be due to consequence of various factors like natural factors, gender selection abortion, infanticides, aging, deliberate gendercide, tradition of son preference [4,2]. The other reasons may be differential mortality rates between the sexes at different ages, and losses and gains through migration [3]. Consequently, the sex ratio tend to reduce as age increases, similar results were also noticed in the present study.

### Land use statistics of Bilaspur district

Land use statistics for agriculture and pasture (table 9) revealed that agriculture land use was found maximum in zone II marginal farmers (75.51 %) whereas; lowest was in large farmers from zone I (50.66 %). Pasture land use was observed maximum in large farmers from zone I (49.33%) while, minimum was in marginal farmers from zone II (24.48%). The average land holding was observed to increase from marginal to large farmer category. However, maximum per cent of agriculture land holding was noticed in marginal farmers this might be due to maximum utilization of available land for crop production in order to meet the livelihood. Panshikar and Mendhapurkar [11] reported 64% of farming families have less than <1ha of agriculture land. However, it is observed that as the land holding increase, farmer's socioeconomic status also increases.

### Land use statistics of Hamirpur district

It is clear from data presented in table 9 that in Hamirpur district agriculture land use was recorded to be higher in comparison to pasture land use. Highest per cent of agriculture land use was noticed in zone III marginal farmers (68.89%), while lowest was recorded in zone II large farmers (42.37%). Whereas, pasture land use was observed to be maximum in zone I large farmers (55.98%) and minimum was recorded in marginal farmers from zone III (30.61%). The study indicated that number of farmers in small and marginal category has increased whereas, farmers in large category has decreased. The above results are in conformity with the findings of Mears [13], who reported that number of small and marginal operational land holdings has increased owing to population growth and sub division, while larger land holdings have decreased proportionately in number.

### CONCLUSION

Family structure and average family size was found to vary with altitude and farmer categories in Bilaspur and Hamirpur districts. The variation observed may be due to variation in socioeconomic condition and preference of number of children, joint/nuclear family. In both the district most of the population was observed to lie in 15-60 year age group, which indicated that there was maximum actively working population. The literacy per cent represented higher literacy, reason being that people were giving more importance to education. In land use system, maximum land use was under agriculture since people kept their available land under cultivation to meet their daily needs.

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