

Original Research Article

Comprehensive Socio economic and Demographic profile of farm households in West Bengal, India

ABSTRACT

A Comprehensive Scheme for Study on Cost of Cultivation or Production of Principal Crops (CCPC) in India has collected data on costs and returns of various inputs and their prices of principal crops along with social, economic and demographics of farm households in West Bengal. The accurate information that has been generated through these surveys is of paramount importance. In this study socio demographic data has been utilized to identify the distribution of social, economic and demographic characteristics of farm households among different agro climatic zones of West Bengal. Results revealed that the distribution of these characteristics viz. land holding size ($\chi^2 = 32.55$; $P < .01$), farmers' education ($\chi^2 = 46.22$; $P < .01$), farm household education ($\chi^2 = 58.42$; $P < .01$), farmers' age ($\chi^2 = 39.94$; $P < .01$), dependency status ($\chi^2 = 30.05$; $P < .01$), labour force participation rate ($\chi^2 = 17.69$; $P = .05$), farmers occupation ($\chi^2 = 27.63$; $P = .05$) and annual net family income ($\chi^2 = 35.33$; $P = .05$) found significant and independent among the different agro-climatic zones of West Bengal.

Keywords: Farm households, Cost of Cultivation, Agro climatic zones, Socio economic and demographic characters.

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1. INTRODUCTION

Agricultural household is referred as “households engaged in self-employment or own account activities in agriculture such as crop production, raising livestock, fishing and forestry-related activities” [1]. Similarly, a household has been described as “a site in which intense social and economic interdependencies occur between a group of individuals” [2]. Household demography is one of the capital and labour saving technology, which determines not only the amount of labour available for farming but also determines the amount of land that can be used during the absence of capital and labour.

A demographic base becomes more relevant to have a comprehensive profile of the farm households [3]. The demographic characteristics like gender, age, family size and dependency ratio, affects the economic conditions and in turn the social conditions (i.e education) of farm households. The age of the household head is an important factor as it determines whether the household benefits from the experience of older farmers or the risk taking attitude of young farmers [3]. Demographic variables like gender, income and education have a significant relationship with technology adoption and its application [4]. Tarhini et al. [5] studied the impact of age and technology usage behavior. Prado et al. [6] identified that young farmers have been keen interest in collecting agricultural information for increasing their efficiency in farm operations, more aware and ready to adopt new technologies for long term benefits [7]. The availability of labour force had shown an influence on different types of farming systems like subsistence farming, transition farming or large scale farming [8]. Economic conditions of the farmers are determined by available capital, occupation and income levels etc. farmers with more wealth cultivate much larger areas and use higher levels of animal traction, resulting in higher levels of household wealth which will alter the status on agricultural practices [9]. The study on demographic profile also helps us to understand the attitude of farmers on the adoption of modern production methods and also use of other non-labour inputs for their proper utilization. Chen and Korinek [10] reported that rural household economic activity point to the significance of household demography, life course transitions, and local economic structures as factors facilitating household labour reallocation. Keeping in view of these social, economic and demographic variables of farm households in West Bengal, the present study was undertaken to understand the distributional pattern and its variability across different agro-climatic zones of West Bengal in India

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2. MATERIAL AND METHODS

The study area (i.e West Bengal) is situated in eastern part of the country between 21° 25' 24" to 27° 13' 15" N latitude and 85° 48' 20" to 89° 53' 04" E longitude covering an area of 88,752 sq. km which is about 2.7 percent of India's total geographical area. Bengal is predominantly an agrarian state and for the attainment of scientific management of regional resources and sustainable agricultural development, the state has been stratified into six agro-climatic sub-zones viz., hill zone, terai zone, new alluvial zone, old alluvial zone, red lateritic zone and coastal zone. The study excludes hill agro-climatic zone due to non availability of cost of cultivation data.

The data relevant to the present study was collected through three-stage stratified Probability Proportional to Size With Replacement (PPSWR) followed by stratified Without Replacement sampling design under the scheme entitled "Comprehensive Scheme for Studying Cost of Cultivation of Principal Crops in India" launched by the Government of India in 1970-71 and is operated by the Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare [11]. The representative demographic data of 600 farmers in different agro-climatic zones of West Bengal which had been collected under the above said scheme during the block year 2008-2011 (where one block year consists of a cluster of three years viz. 2008-09, 2009-10 and 2010-11) have been utilized for the present study. The frequency analysis was performed to determine the share of demographics of farm households for each agro-climatic zone and comparing these shares to choose a strategy across the farmers in each zone. The chi-square test has also been performed to assess the significance of differences among k independent groups (agro-climatic zones). In general, the chi-square test is similar for both two and k independent samples or groups.

2.1. The Chi-square test for k independent samples

Chi-square test is used when the experimental data consist of frequencies in discrete categories (either nominal or categorical or sometimes ordinal) [12]. To apply the chi-square test, first arrange the frequencies in an $r \times k$ contingency table where the data in each column are the frequencies of each of the r categorical responses for each of the k different groups or samples. The null hypothesis is that k samples of frequencies have come from the same population or from identical populations. This hypothesis, i.e. k populations do not differ among themselves may be tested by applying the following equations.

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^k \frac{(n_{ij} - E_{ij})^2}{E_{ij}}$$

or

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^k \frac{n_{ij}^2}{E_{ij}} - N$$

Where

n_{ij} = observed number of cases categorized in the i^{th} row of the j^{th} column

$E_{ij} = \frac{R_i C_j}{N}$ number of cases expected in the i^{th} row of the j^{th} column

$R_i = \sum_{j=1}^k n_{ij}$ = total frequency in the i^{th} row

$C_j = \sum_{i=1}^r n_{ij}$ = total frequency in the j^{th} column and the double summation is over all rows and columns of the table (i.e. summation across all cells).

The values of χ^2 obtained by using above equations are distributed asymptotically (as N gets large) as χ^2 with $df = (r - 1)(k - 1)$, where r is number of rows and k is number of columns in the contingency table. The Chi square test was performed using Statistical Program for the Social Science (SPSS 25.0).

3. RESULTS AND DISCUSSION

This study deals with demographic characteristics of farmers which are associated with socio economic conditions of the farm households. However, These included farmers' age, land holding size, household size, level of education, sex ratio, dependency status, labour force participation rate (%), occupation, annual net income of family, as well as other relevant information. The distributions of socio economic and demographic characteristics of farm households are helpful in understanding the demographic profile of farm households in different agro-climatic zones of West Bengal.

3.1. Age

Age wise distribution of population helps to know about the proportion of the total labour force, occupational structure, demand pattern and dependency ratios of the population. The findings about the age of the farm households (Table 1), revealed that majority of the farm households (65.55%) in West Bengal belongs to the age group of 15-59 years. About 9.77% percent households were found above the age of 60 years. When comparison has is made between the zones, red lateritic zone (68.75%) has maximum number of farm households in the group of 15-59 years followed by new alluvial zone (66.44%), old alluvial zone (64.63%), terai zone (63.56 %) and coastal zone (62.40%). Thus, all the zones have low percentage of children, youth and marginally low percentage of old and substantially high percentage of productive age group (15-59 years). The findings indicate that majority of farm households in the study area were having an average age of 49 years and this may be because of much involvement of young and medium age people in farming operations.

Table 1: Age distribution of farm households in each agro-climatic zone of West Bengal (n=600)

Age (in years)	Terai Zone	New Alluvial Zone	Old Alluvial Zone	Red Lateritic Zone	Coastal Zone	West Bengal
0 - 9 (Child)	83 (16.80)	133 (12.86)	146 (13.31)	109 (15.48)	58 (15.47)	529 (14.28)
10 – 15 (Youth)	60 (12.15)	122 (11.80)	110 (10.03)	55 (7.81)	38 (10.13)	385 (10.39)
15 – 59 (Adult)	314 (63.56)	687 (66.44)	709 (64.63)	484 (68.75)	234 (62.40)	2428 (65.55)
60 and above (Old)	37 (7.49)	92 (8.90)	132 (12.03)	56 (7.95)	45 (12.00)	362 (9.77)
Total	494 (100.00)	1034 (100.00)	1097 (100.00)	704 (100.00)	375 (100.00)	3704 (100.00)
χ^2	39.94**					

Source: Computed based on cost of cultivation survey data for the block year (2008-11)

Figures in parenthesis indicates per cent distribution of farm households

** represents statistical significance at 1% level.

3.2. Land holding size

According to land holding size, farmers' are grouped into five categories given in Table 2 [13] viz., marginal (less than 1 ha.), small (1-2 ha.), semi-medium (2-4 ha.), medium (4-10 ha.) and large (more than 10 ha.). From Table 2, it was observed that terai zone has the highest number of semi-medium land holders (45.71%), while small land holders were dominated in coastal zone (56.67%) followed by old alluvial (47.78%), red lateritic (46.67%) and new alluvial (41.76%) zones. Out of 600 surveyed farmers in the study area as a whole, 44% per cent of farmers are small land holders, 27.17% per cent are semi-medium land

holders, 24.83% per cent are marginal land holders, four per cent are medium land holders and no farmers had above 10 hectares of land (large land holders).

Table 2: Distribution of farm households according to their land holding size (n=600)

Farm Category	Terai Zone	New Alluvial Zone	Old Alluvial Zone	Red Lateritic Zone	Coastal Zone	West Bengal
Marginal (<1 ha.)	15 (21.43)	50 (29.41)	43 (23.89)	24 (20.00)	17 (28.33)	149 (24.83)
Small (1-2 ha.)	17 (24.29)	71 (41.76)	86 (47.78)	56 (46.67)	34 (56.67)	264 (44.00)
Semi-Medium (2- 4 ha.)	32 (45.71)	42 (24.71)	47 (26.67)	35 (29.17)	7 (11.67)	163 (27.17)
Medium (4-10 ha.)	6 (8.57)	7 (4.12)	4 (2.22)	5 (4.17)	2 (3.33)	24 (4.00)
Large (>10 ha.)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
Total	70 (100.00)	170 (100.00)	180 (100.00)	120 (100.00)	60 (100.00)	600 (100.00)
χ^2	32.55**					

Source: Computed based on cost of cultivation survey data for the block year (2008-11)

Figures in parenthesis indicates per cent distribution of farm households

** represents statistical significance at 1% level.

3.3. Household size

The demographic factors like family size, sex ratio and dependency may influence the economic activity of the farm family. The farm households in all agro-climatic zones were dominated by medium sized farm households (4-6 persons) with an average household size of six members. According to Patel [14], the farm households were classified into four

categories such as small (1-3 persons), medium (4-6 persons), large (7-9 persons) and very large (more than 10 persons). The distribution of farm households according to the size of household (Table 3) indicated that majority (52.33%) of farm households in the state of West Bengal have 4 to 6 members (medium size) where as 22.50 per cent belongs to large size families, 12.67 per cent belongs to very large sized families and rest 12.50 per cent farm households have 1 to 3 family members (small size).

Table 3: Distribution of farmers according to their household size (n=600)

Family Category	Terai Zone	New Alluvial Zone	Old Alluvial Zone	Red Lateritic Zone	Coastal Zone	West Bengal
Small (1-3 persons)	5 (7.14)	26 (15.29)	18 (10.00)	19 (15.83)	7 (11.67)	75 (12.50)
Medium (4-6 persons)	31 (44.29)	84 (49.41)	102 (56.67)	62 (51.67)	35 (58.33)	314 (52.33)
Large (7-9 persons)	24 (34.29)	38 (22.35)	37 (20.56)	25 (20.83)	11 (18.33)	135 (22.50)
Very Large (>= 10 persons)	10 (14.29)	22 (12.94)	23 (12.78)	14 (11.67)	7 (11.67)	76 (12.67)
Total	70 (100.00)	170 (100.00)	180 (100.00)	120 (100.00)	60 (100.00)	600 (100.00)
χ^2	12.42					

Source: Computed based on cost of cultivation survey data for the block year (2008-11)

Figures in parenthesis indicates per cent distribution of farm households

3.4. Education

Education is one of the important factors which indicate the social status and development of the family or a society. It also reflects the economic condition of the family, imparts better knowledge and nature of understanding. The distribution of farmers and their households according to their education level are presented in Tables 4 (a) and 4 (b) respectively. From

Table 4 (a), it can be observed that 16.67 per cent of farmers in the state of West Bengal were illiterates and 26.17 per cent farmers were educated upto primary school level. Interestingly about 47 per cent had secondary school level of education and only 10.17 per cent farmers have passed higher secondary school. It is also observed that majority farmers have secondary school level of education in all agro-climatic zones of West Bengal. The poor education status in the study area may be due to poor access to higher secondary school and colleges to the farmers.

Table 4 (a): Distribution of education of household head in West Bengal (n=600)

Education Category	Terai Zone	New Alluvial Zone	Old Alluvial Zone	Red Lateritic Zone	Coastal Zone	West Bengal
Illiterate	20 (28.57)	35 (20.59)	32 (17.78)	12 (10.00)	1 (1.67)	100 (16.67)
Primary	16 (22.86)	57 (33.53)	39 (21.67)	29 (24.17)	16 (26.67)	157 (26.17)
Secondary	32 (45.71)	69 (40.59)	82 (45.56)	68 (56.67)	31 (51.67)	282 (47.00)
Post Secondary	2 (2.86)	9 (5.29)	27 (15.00)	11 (9.17)	12 (20.00)	61 (10.17)
Total	70 (100.00)	170 (100.00)	180 (100.00)	120 (100.00)	60 (100.00)	600 (100.00)
χ^2	46.22**					

From the Table 4 (b), it can be observed that 19.30 per cent of members in household were illiterates and 27.40 per cent of them are with primary level of education. About 45.76 per cent of farm households have secondary level of education and only 7.53 per cent have post secondary level of education. Similar to household head, the household members also have secondary level of education in all agro-climatic zones of West Bengal.

Table 4 (b): Distribution of education of household members in West Bengal (n=3704)

Education Category	Terai Zone	New Alluvial Zone	Old Alluvial Zone	Red Lateritic Zone	Coastal Zone	West Bengal
Illiterate	99 (20.04)	244 (23.60)	213 (19.42)	111 (15.77)	48 (12.80)	715 (19.30)
Primary	162 (32.79)	297 (28.72)	257 (23.43)	200 (28.41)	99 (26.40)	1015 (27.40)
Secondary	215 (43.52)	441 (42.65)	521 (47.49)	341 (48.44)	177 (47.20)	1695 (45.76)
Post Secondary	18 (3.64)	52 (5.03)	106 (9.66)	52 (7.39)	51 (13.60)	279 (7.53)
Total	494 (100.00)	1034 (100.00)	1097 (100.00)	704 (100.00)	375 (100.00)	3704 (100.00)
χ^2	58.42**					

Source: Computed based on cost of cultivation survey data for the block year (2008-11)

Figures in parenthesis indicates per cent distribution of farm households

** represents statistical significance at 1% level.

3.5. Sex ratio

Sex ratio may influence the economic power of family especially women [15]. Both male and female are required in the process of farm operations and other economic activities. Response of results revealed that on an average 53.08 per cent are males and 46.92 per cent are females out of 3704 members of 600 farm households in the study area (Table 5). The male to female ratio is found to be 1.13 and female to male ratio is 0.88. When comparison has made among the agro-climatic zones, terai zone has highest male to female ratio (1.27) and least female to male ratio (0.79), while coastal zone has least male to female ratio (1.07) and highest female to male ratio (0.93).

Table 5: Sex ratio of the farm households in each agro-climatic zone of West Bengal

Sex	Terai Zone	New Alluvial Zone	Old Alluvial Zone	Red Lateritic Zone	Coastal Zone	West Bengal
Male	276 (55.87)	543 (52.51)	573 (52.23)	380 (53.98)	194 (51.73)	1966 (53.08)
Female	218 (44.13)	491 (47.49)	524 (47.77)	324 (46.02)	181 (48.27)	1738 (46.92)
Total	494 (100.00)	1034 (100.00)	1097 (100.00)	704 (100.00)	375 (100.00)	3704 (100.00)
Male to Female Ratio	1.27	1.11	1.09	1.17	1.07	1.13
Female to Male Ratio	0.79	0.90	0.91	0.85	0.93	0.88
χ^2	4.69					

Source: Computed based on cost of cultivation surveys data for the block year (2008-11)

Figures in parenthesis indicates per cent distribution of farm households

3.6. Dependency status

The socio-economic life of a household is affected by the ratio of dependency i.e. the ratio between non-working populations to working population. More the number of working members in a household have higher possibility to lead a better economic life than those who have less number of working members. The classification of members such as earners, earning dependents (An earning dependent is not able to earn adequate income to maintain himself or herself) and dependents are furnished in the Table 6. Out of total surveyed population, 59.77 per cent are dependents, 18.71 per cent are earning dependents and only 21.52 per cent are earners in the study area. Among the agro-climatic zones, terai zone has highest percentage of dependents (64.57%) and coastal zone has lowest percentage of

dependents (56%). Approximately 20 per cent of farm households in each agro-climatic zone earn money for their families.

Table 6: Distribution of farm households according to their dependency status

Category	Terai Zone	New Alluvial Zone	Old Alluvial Zone	Red Lateritic Zone	Coastal Zone	West Bengal
Earners	101 (20.45)	215 (20.79)	226 (20.60)	184 (26.14)	71 (18.93)	797 (21.52)
Earning Dependents	74 (14.98)	169 (16.34)	233 (21.24)	123 (17.47)	94 (25.07)	693 (18.71)
Dependents	319 (64.57)	650 (62.86)	638 (58.16)	397 (56.39)	210 (56.00)	2214 (59.77)
Total	494 (100.00)	1034 (100.00)	1097 (100.00)	704 (100.00)	375 (100.00)	3704 (100.00)
χ^2	30.05**					

Source: Computed based on cost of cultivation survey data for the block year (2008-11)

Figures in parenthesis indicates per cent distribution of farm households

** represents statistical significance at 1% level.

3.7. Labour Force Participation Rate (LFPR %)

The labour force of population determines the level of socio economic development. All the members in a population may not participate in production activities but some of them are actually participate in those activities. This population may be termed as economically active population or labour force or working population. The work force participation indicates the number of eligible labour available in the farm households and is calculated by using the formula given by Suri and Chhabra [16]. The working population in an enterprise generally includes the persons work for pay or profit, unpaid family workers and the persons who involved in production of economic goods and services.

$$\text{Labour Force Participation Rate (\%)} = \frac{\text{Number of working population}}{\text{Total population}} \times 100 \quad (1)$$

The results revealed that an average labour force participation rate was 67.30 per cent in West Bengal (Table 7), where highest participation rate was in the coastal zone (78.57%) followed by red lateritic zone (77.33%), old alluvial zone (71.94%), new alluvial zone (59.08%) and lowest in terai zone (54.86%).

Table 7: Labour force participation rate of farm households in West Bengal

Members of Labourers	Terai Zone	New Alluvial Zone	Old Alluvial Zone	Red Lateritic Zone	Coastal Zone	West Bengal
Total Population	494	1034	1097	704	375	3704
Working population	175	384	459	307	165	1490
Dependent population	319	650	638	397	210	2214
LFPR (%)	54.86	59.08	71.94	77.33	78.57	67.30
χ^2						17.69*

Source: Computed based on cost of cultivation survey data for the block year (2008-11)

* represents statistical significance at 5% level.

3.8. Occupation

Majority of the farmers' occupation in India revolves round the land activities, as a cultivator or agricultural labour. Occupational distribution of farmers in various sectors of activities gave us further insight into the economic wellbeing of the farm households. In West Bengal more than 90 per cent of farmers in all agro-climatic zones have crop production as major occupation except coastal zone farmers (73.33%). While considering the occupation in service and other sectors coastal zone farmers' involvement is much more compared to other zone farmers and negligible per cent of sampled farmers is have non-crop agriculture as a major occupation in all agro-climatic zones (Table 8).

Table 8: Distribution of farmers according to their occupation in West Bengal (n=600)

Occupation	Terai Zone	New Alluvial Zone	Old Alluvial Zone	Red Lateritic Zone	Coastal Zone	West Bengal
Crop production	69 (98.57)	154 (90.59)	165 (91.67)	109 (90.83)	44 (73.33)	541 (90.17)
Non-crop agriculture	0 (0.00)	0 (0.00)	2 (1.11)	0 (0.00)	1 (1.67)	3 (0.50)
Service and other sectors	1 (1.43)	16 (9.41)	13 (7.22)	11 (9.17)	15 (25.00)	56 (9.33)
Total	70 (100.00)	170 (100.00)	180 (100.00)	120 (100.00)	60 (100.00)	600 (100.00)
χ^2	27.63*					

Source: Computed based on cost of cultivation survey data for the block year (2008-11)

Figures in parenthesis indicates per cent distribution of farm households

* represents statistical significance at 5% level.

3.9. Annual net family income

Income is another important yardstick used in measuring economic conditions of the farm households. Higher the level of income, better is the living standard of farm households. The details regarding annual net income of the farm households include net income from agriculture and other subsidiary sources, business and services during the study period. The findings revealed that 50.67 per cent of farm households have annual net income of below Rs. 24,000 (Table 9). While 28.17 per cent falls under the income group of Rs. 24000-60000 per annum and 13.67 per cent comes under the income group of Rs. 60000-120000 per annum. Less than 10 per cent of farm households have an annual net income of Rs. 120000 and above in the study area of West Bengal. Among the agro climatic zones, more than 75 per cent of farm households have a net income up to Rs. 60,000 per annum except in coastal zone (63.33%).

Table 9: Distribution of farm households based on annual net family income (n=600)

Annual family income (Rs.)	Terai Zone	New Alluvial Zone	Old Alluvial Zone	Red Lateritic Zone	Coastal Zone	West Bengal
Below 24000	42 (60.00)	87 (51.18)	76 (42.22)	76 (63.33)	23 (38.33)	304 (50.67)
24000-60000	15 (21.43)	51 (30.00)	65 (36.11)	23 (19.17)	15 (25.00)	169 (28.17)
60000-120000	7 (10.00)	21 (12.35)	30 (16.67)	10 (8.33)	14 (23.33)	82 (13.67)
120000-240000	6 (8.57)	7 (4.12)	7 (3.89)	9 (7.50)	6 (10.00)	35 (5.83)
Above 240000	0 (0.00)	4 (2.35)	2 (1.11)	2 (1.67)	2 (3.33)	10 (1.67)
Total	70 (100.00)	170 (100.00)	180 (100.00)	120 (100.00)	60 (100.00)	600 (100.00)
χ^2	35.33*					

Source: Computed based on cost of cultivation survey data for the block year (2008-11)

Figures in parenthesis indicates per cent distribution of farm households

*represents statistical significance at 5% level.

Finally, the chi-square test of the socio economic and demographic characteristics viz., farmers' age ($\chi^2 = 39.94$; $P < .01$), land holding size ($\chi^2=32.55$; $P < .01$), household head education ($\chi^2=46.22$; $P < .01$), household members education ($\chi^2=58.42$; $P < .01$), dependency status ($\chi^2=30.05$; $P < .01$), labour force participation rate ($\chi^2=17.69$; $P < .05$), farmers occupation ($\chi^2=27.63$; $P < .05$) and annual net family income of farm households ($\chi^2=35.33$; $P < .05$) were found significant and implying that the distribution of these characteristics are independent among the different agro-climatic zones of West Bengal.

The chi-square test of household size ($\chi^2=12.42$) and sex of the farm households ($\chi^2=4.69$) had shown non-significant results.

4. SUMMARY AND CONCLUSION

The anatomy of social and demographic characteristics such as farmers' age, size of holding, family size, sex ratio, dependency ratio, occupational structure, literacy level have an influence on the process of economic development. The demographic study observed that majority farmers in the study area are small farmers (43.83%) with an average land holding size of 1.5 hectares and have crop production as a major occupation. The households in this study are medium sized families (4 to 6 members). The educational status of households revealed that 80.70 per cent were literates and only 19.30 per cent were illiterates. Majority of them have secondary level of education and minimum of two members earn money for their family. It is also visualized that farm households in red lateritic and coastal zone has maximum literacy percentage. While examining the sex ratio, male population seems to dominate in all zones to the extent of 50-55 per cent and only 45-50 per cent are females. The annual family income of farm households revealed that 50.67 per cent farm households annual income range falls below Rs. 24,000 per annum, and they were considered as living under the poverty line. The average labour force participation rate in West Bengal is 67 per cent.

A wide variety of social and economical outcomes are impacted by demographic processes and distributions in a particular locality or region. The cost of cultivation survey data utilized in the present study is an important source for policy makers, administrators and individual researchers for making decisions at the macro as well as micro level. The results from this demographic study could help us to understand the investment behavior of agriculturists on crop production and aid in the importance of education to farmers, estimate the required funding for welfare of farming community and develop workable healthcare systems. The significance of independence of these characteristics across different agro-climatic zones lies in its contribution to help government and society to deal with regional issues and demands of the farmer's community.

Comment [M.3]: This should have been covered in the abstract

Comment [M.4]: This should be transferred under abstract

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