

Socio-economic Characteristics of Homegardens in Bhimtal block of Nainital District, Uttarakhand, India

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Abstract

In the present investigation was carried out to access the socio-economic characteristics of homegardens in Bhimtal block of Nainital district of Uttarakhand during 2014-15. The result show that the maximum number of respondents 34 (51.51%) were middle aged followed by 20 (30.30%) of respondents were in young age category and 12 (18.18%) respondents were in old age. The data showed that maximum number of respondents, 25 (37.87%) were education up to 12th followed by illiterate 17 (25.75%) followed by higher education above 12th respondent 14 (21.21%), whereas 10 (15.15%) had education up to 8th level. It was observed that maximum number of household families 26 (39.39%) belonged to farming which was the primary source of income followed by 22 (33.33%) belonged to service class followed by 13 (19.69%) families that were dependent in the business for their livelihood, followed by wage labourers 5 (7.57%) families. It was found that maximum number of land households 32 (48.48%) were marginal land followed by small landholding households 20 (30.30%), followed by large land holding 14 (21.21%). Almost 50% of the rural households in the hills were headed by women as the men folk migrated to augment the farm income. Data regarding awareness of the forestry programmes among the farmers revealed that majority of the farmers 49 (74.24%) were not aware of the forestry programmes and small number of farmers 17 (25.75%) were aware. About 90% of the total cultivated area is rainfed and irrigated area is only 10 per cent.

Highlights

- The result showed that the maximum number of respondents 34 (51.51%) were middle aged followed by 20 (30.30%) in young age category and 12 (18.18%) old age.
- It was observed that maximum number of household families 26 (39.39%) belonged to farming which was the primary source of income followed by 22 (33.33%) belonged to service class followed by 13 (19.69%) families that were dependent in the business for their livelihood, followed by wage labourers 5 (7.57%) families.
- Data regarding awareness of the forestry programmes among the farmers revealed that majority of the farmers 49 (74.24%) were not aware of the forestry programmes and small number of farmers 17 (25.75%) were aware. About 90% of the total cultivated area is rainfed and irrigated area is only 10%.

Keywords: Homegardens, socio-economic characteristics, Bhimtal block, Nainital, Garhwal, Uttarakhand

Historically, communities have always been using and extracting resources from the forests based on indigenous/traditional management practices such as slash and burn agriculture, grazing, fires and sacred groves to ensure continued availability of

diverse resources. Clearing of natural ecosystems, land degradation due to unsustainable agricultural practices and dramatically growing population are becoming threats to the sustainability and productivity of agricultural systems in developing

country like India while conserving natural resources is one of the greatest contemporary challenges decision makers face. Interestingly, there is a growing interest in integrating traditional farming system into different agroforestry systems especially in homegardens system as a critical step towards achieving the goal “combating extreme poverty and hunger” (Rana *et al.*, 2017; Kumar and Tripathi, 2017). Homegardens is an important wheels of vehicle for biodiversity, environmental and ecological benefits, food security (either directly food grains, fruits, vegetables and root crops or indirectly improving soil conditions and there by promoting understory crop productivity especially on degraded sites), nutritional security, soil conservation potential, mitigation of the impact of climate change and job opportunity in tropics (Kumar, 2017; Kumar and Tripathi, 2017). Homegardens play significant sources of minerals and nutrients (Asfaw and Woldu, 1997). In addition, the diverse products available year round in the homegardens contribute to food security especially during ‘lean’ seasons (Karyono, 1990).

Forest resources have always been an important part of subsistence as well as livelihoods for forest dwellers and rural communities. As the political economy of forest resources changes globally, Non-Timber Forest products (NTFPs) are increasingly argued as having high value in the tropical region (Mahapatra and Tewari 2005). It is only in recent decades that the status of NTFPs has improved due to the realisation that they contribute substantially to the rural economy.

In an Indian context, more than 100 million people who stay within or around forest areas greatly rely on the gathering and trading of NTFPs (Bhat *et al.*, 2003; Rasul *et al.*, 2008). Non-Timber Forest Products play a vital role in livelihood of people in and around the forests in tropics region (Kumar *et al.*, 2014; Kumar, 2014; Kumar, 2015). Interestingly, in the remote areas where even basic health care is not available, people use NTFPs as herbal medicines. Findings in tropical forest regions show that there are certain NTFPs that can be used for both medicinal and food purposes to improve palatability and can act as a health tonic or prophylactic (Angelsen and Wunder, 2003; Quang and Anh, 2006; Kumar and Desai, 2014; Kumar, 2015).

Materials and Methods

The state of Uttarakhand is situated in the northern part of India and shares an international boundary with China in the north and Nepal in the east. It has an area of 53,483 km² and lies between latitude 28°43’ and 31°28’ N and longitude 77°34’ and 81°03’ E. The recorded total forest and tree cover of the state is 21,505 km², which constitutes 45.43 per cent of its geographical area (ISFR, 2015). The population density of Uttarakhand is 829 persons per sq. km whereas in India the average is 382 persons per sq. km. Nainital district of Uttarakhand is situated between 28°8’ and 29°6’ North latitude and between 78°8’ and 80°14’ East longitude and covering an area of about 4251 square kilometres (Fig. 1).

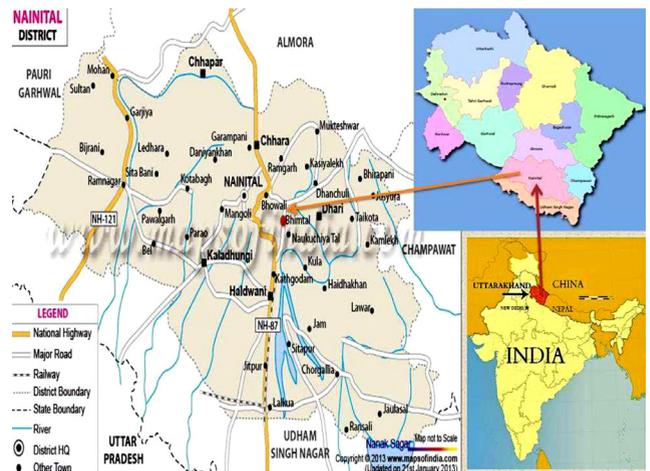


Fig. 1: Geographic map of the study area and dark dot indicate the place of the research area

On the basis of geographical conditions, the district is divided into two regions, *viz.*, Bhabhar and Hilly area. The Bhabhar is an area that lies between tarai track and foot hills of Shivalik range of Himalaya. The soils in this area are porous and contain a lot of gravels in the soil column. The maximum area of Nainital district is covered by hilly region. This region is manifested with wide agro-climatic variability ranging from sub-tropical to alpine zone. Consequently the climate of the region varies from place to place in accordance with altitudinal variation, slope aspect, density and kind of vegetation.

In January, the mean maximum temperature ranges between 9.7° C to 10.2° C and in month of May it varies from 23.5° C to 24.8° C. Annual relative humidity at 830 hours varies from 60-70 per cent (Fig. 2). The annual total rainfall is more

than 1800 mm, out of which more than 90 per cent precipitation is received from summer monsoon *i.e.* June to mid-October, eight per cent from the winter cyclone *i.e.* January-March and the remaining two per cent from the relating monsoon in mid October-December and pre-monsoon showers in April-May. Bhabar soils are shallow with loamy sand with abundant quantities of gravels and stones. Water percolation through profile is very rapid and nutrient and moisture retention capacity and fertility of soil is low.

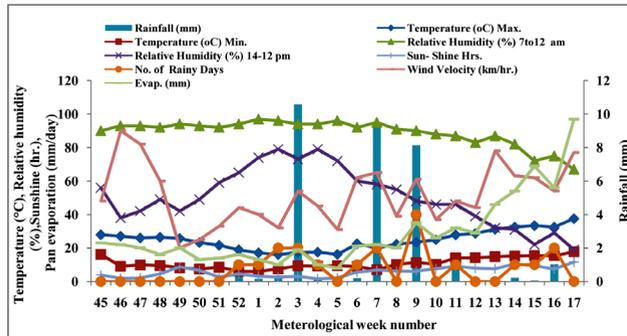


Fig. 2: Weekly average weather parameters during the experimental period of 14th November to 24th April, 2013-14

Sampling area: From Nainital district three villages Amritpur, Jeolikote and Ghorakhal of Bhimtal block were selected due to representative sites of the district and on the basis of variation on type of trees species, soil status and how these help in biological diversity. Amritpur village is situated in Nainital Tehsil placed at 520 mts elevation of uttarakhand, which is 217 km away from the Dehradun. Amritpur is surrounded by Haldwani Tehsil towards south, Dhari Tehsil towards west, Nainital and Ramgarh Tehsil towards north. Jeolikote village situated in Nainital Tehsil placed at height of 1219 mts, which located 19 km from kathgodam and 18 km away from Nainital. Ghorakhal village located in Ramgarh Tehsil at Nainital and placed at a height of 2000 mts. It is located 13 km towards east from district Nainital, 206 km from Dehradun. Ghorakhal is surrounded by Bhimtal and Dhari Tehsil towards south, Nainital Tehsil towards west, Almora Tehsil towards north.

Selection of the Respondents: Twenty two families of each village were selected on the basis of land holding capacity, *i.e.*, marginal (<1ha), small (1-2 ha), medium (2-5 ha) and large (>5 ha).

Socio-economic characteristics of respondents

- (i) **Age:** It refers to the chronological age of the respondent in complete years at the time of investigation. The respondent were classified as young (21-35), medium (36-45) and old (>45) (Chaudhary, 2013).
- (ii) **Education:** It refers to the formal level of education completed by the respondent at the time of investigation and was divided into four categories, viz. illiterate, primary, intermediate and above intermediate.
- (iii) **Caste:** It refers to the endogamous and hereditary sub division which occupies a position of superior or inferior rank in comparison to other sub groups. It was categorized into four groups: *viz*; general, OBC, SC and ST as per norms of Government of Uttarakhand.
- (iv) **Family type:** It refers to a group of two or more individual residing together who are related by blood, marriage or adoption. It was categorized as joint and nuclear family.
- (v) **Family size:** It refers to the number of persons in a single family unit. It considered the total number of members residing in a household at the time of investigation. It was divided into small (up to 5), medium (6-10), and large (more than 10) (Chaudhary, 2013).
- (vi) **Type of house:** It refers to the type of dwelling in which the respondent resides. It was categorized as Kaccha (Wood + Soil), Mixed and pucca (Cemented).
- (vii) **Occupation:** It refers to the work done to earn a livelihood. Information was gathered on both primary and secondary occupation of the households and the respondents. An occupational group includes farming, Farming + labour, Labour, service, caste occupation, business and housewife.
- (viii) **Income:** It refers to the total money earned in rupees per year from various occupational sources. It was grouped according to Government of India criteria of below poverty line (*i.e.* ₹ 26/day for rural and 32/day urban for the year 2010-11) and Above Poverty Line.
- (ix) **Land holding:** It refers to operational size of the farm put into cultivation by respondents

family and was divided as per criteria of Government of India into landless, marginal (>1 ha), small (1 to 2 ha), medium (2 to 5 ha) and Large (above 5 ha) (Chaudhary, 2013).

- (x) **Role of women:** It refers to how women play an important role in maintaining agriculture fields, animal rearing, collection of fodder and fuelwood, household's duties and child care.
- (xi) Awareness of the activities of forestry extension programmes
- (xii) Assets
- (xiii) **Source of irrigation:** It includes type of irrigation facility present in the village. It includes gulls, streams, spring etc.

Results and Discussion

Socio-economic characteristics of respondents the study area

Age: The age of respondents was categorized as young, middle and old. Majority of the respondents *i.e.* 34 (51.51%) were middle aged followed by 20 (30.30%) in young age category and 12 (18.18%) in old age (Fig. 3).

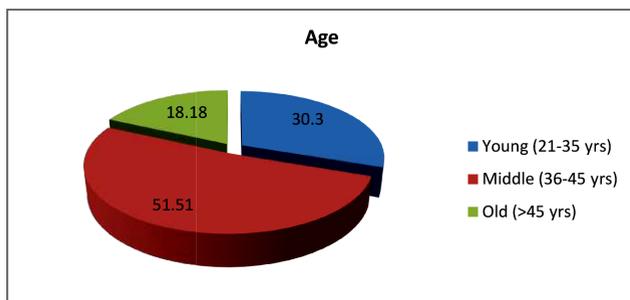


Fig. 3: Distribution of respondents on the basis of age

Recent reports indicated that Majority of the respondents, *i.e.*, 62.50% were middle aged followed by 27.77% in young age category and only 15.27% respondents were in old age in Garhwal Region of Uttarakhand (Rana *et al.*, 2016). The earlier studies also supported the present study which indicates that middle aged persons especially women have more entrepreneurial orientation and innovative ideas and they take up more income generating activities (Arulprakash and Hirevenkanagoudar, 2005; Mehram *et al.*, 2006). On the other hand, young group is busy with their studies and

household activities and old age respondent are not very much involved in planting, collection of fuel wood and fodder activities.

Education: It was revealed from the interview that maximum number of respondents *i.e.* 25 (37.87%) had education up to 12th followed by illiterate 17 (25.75%) followed by higher education above 12th respondent *i.e.* 14 (21.21%), whereas 10 (15.15%) had education up to 8th level (Table 1).

Table 1: Distribution of respondents on the basis of education (N=66)

Sl. No.	Category	Number of respondents	Percentage
1	Illiterate	17	25.75%
2	Primary (1 to 8 th)	10	15.15%
3	Intermediate (8 to 12 th)	25	37.87%
4	Above (12 th)	14	21.21%
5	Total	66	

During informal discussion it was found that education facility was well in the village and nearby area. But the education level of women till the day was less than the man because the women were fully involved in the agriculture as well as household activities. Education may inspire a spirit of self reliance and the willingness to sacrifice immediate financial benefits. According to census 2011-2012, the percentage of literacy rate was 83.88%. Out of this the male literacy rate was found to be 90.07% and female literacy rate 77.29%. Similar study carried out in Garhwal Region of Uttarakhand and observed that maximum number of respondents, *i.e.*, 30.55% had education from 1 to 8th followed by illiterate, *i.e.*, 27.77% whereas 19.44% had education level from 8 to 12th (Rana *et al.*, 2016).

Caste: It was cleared from the table that maximum number of respondents, *i.e.* 35 (53.03%) belonged to general category, followed by 19 (28.78%) who belonged to OBC category and rest, *i.e.* 12 (18.18%) fall under SC/ST category (Fig. 4). Recent reports indicated that 50% of respondents belonged to general category, followed by 40.27% OBC category and rest, *i.e.*, 9.7% fall under SC/ST category in Garhwal Region of Uttarakhand (Rana *et al.*, 2016).

Family type: It was cleared from the data that majority of the family belonged to the nuclear family 39 (59.09%) while only 27 (40.90%) respondent belonged to joint family (Fig. 5). Rana *et al.* (2016)

also reported that 69.49% of the families belonged to the nuclear family while only 30.55% respondents belonged to joint family in Garhwal Region of Uttarakhand. It indicates that nuclear family system is gradually replacing joint family system in rural areas also. This is due to change in socio-cultural fabric in the area under study.

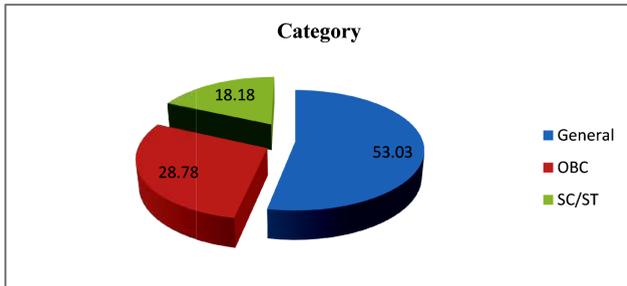


Fig. 4: Distribution of respondents on the basis of Caste

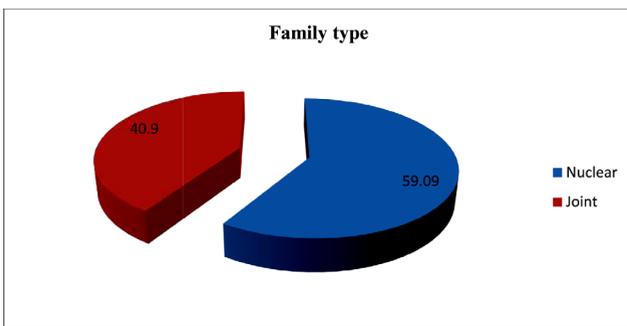


Fig. 5: Distribution of respondents on the basis of Family Type

Family size: It was revealed that majority of respondents *i.e.* 36 (54.54%) belonged to small family, followed by 21 (31.81%) respondent who had medium sized families and only 9 (13.63%) respondent had large family (Fig. 6). Similar study was carried out by Rana *et al.* (2016) and reported that 55.55% of the respondents were small family, followed by 37.50% respondents were medium sized families and only 6.94% respondents had large family in Garhwal Region of Uttarakhand.

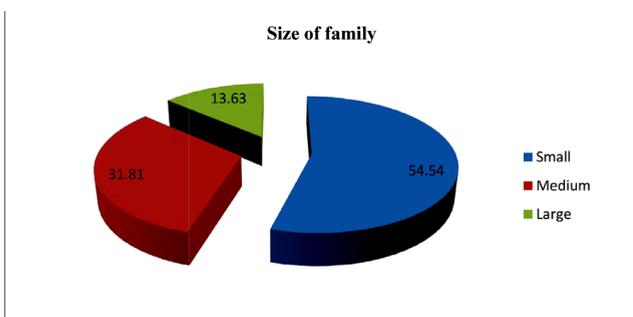


Fig. 6: Distribution of respondents on the basis of size of family

Type of house: It was observed that half of the respondent 55 (83.33%) resided in *pucca* (Cemented) houses, followed by 7 (10.60%) in mixed (*pucca+kaccha*) house. Only 4 (6.06%) respondents were *kaccha* house (Fig. 7).

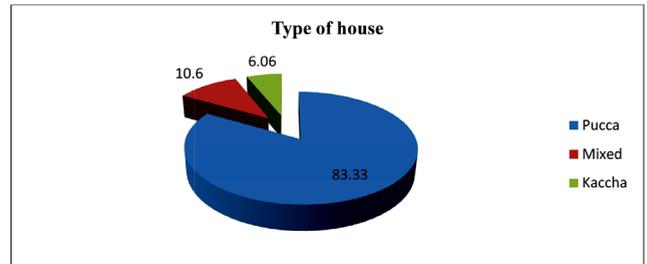


Fig. 7: Distribution of respondents on the basis of type of house

Occupation: It was observed that maximum number of household families *i.e.* 26 (39.39%) belonged to farming which was the primary source of income followed by 22 (33.33%) belonged to service class (13 government, 9 sidcul) followed by 13 (19.69%) families that were dependent in the business for their livelihood, followed by wage labourers 5 (7.57%) families (Fig. 8). In addition to primary occupation, informations were collected on secondary source of income. Out of 66 household, majority of the respondents *i.e.* 49 (74.24%) were house-wives and mainly engaged in domestic chores, and 17 (25.75%) respondents were students. According to (Statistical bulletin, Nainital district, Uttarakhand, 2011-12), 30.36% of persons are farmers, 4.43% agricultural labourers, 1.40% in family business, 3.26% in plantation, 2.97% in transportation and communication, 7.14% in trading and 5.06% in others. The results indicated that selected families earn their income from business, service, self-employment and agriculture.

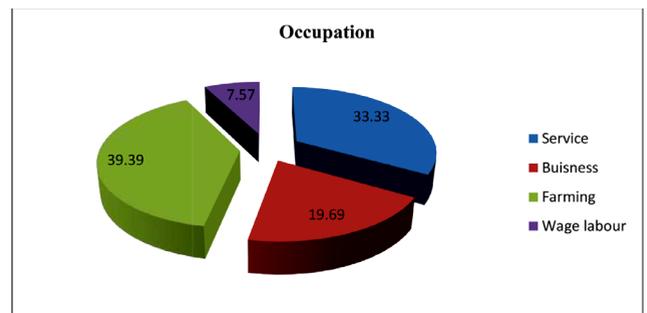


Fig. 8: Distribution of respondents on the basis of Occupation

Income: It was observed that majority of the household *i.e.* 49 (74.24%) belonged to the above poverty line followed by 17 (25.75%) respondents who reported below poverty line cards (Fig. 9).

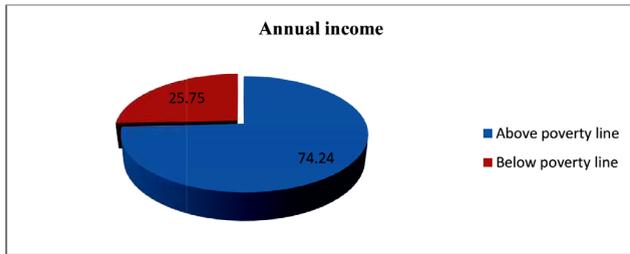


Fig. 9: Distribution of respondents on the basis of annual income

Land holding: It was found that maximum number of land households *i.e.* 32 (48.48%) were marginal land followed by small landholding households 20 (30.30%), followed by large land holding 14(21.21%) (Fig. 10). It was also observed that the agriculture land was rainfed *i.e.* dependent on the rain. It was noted that 48.48% of farmers were marginal homegardens land (6-10 nali) and 30.30% were only a small area of homegardens land (<5 nali).

Thus, a considerable number of farmers possessed a very limited amount of home garden land. Homegardens land was also used as a field for vegetable production mainly for the purpose of household consumption. It was also seen in Bangladesh that 51% of the households had less than 0.08 ha of homestead land, and only 17% of the remaining households had 0.16 ha or more of homestead land. In this also a little number of farmers had limited amount of homestead land (Salam *et al.*, 2000). Similar type of study conducted by Daniel *et al.* (2012) where it was found that small farms of the hill region with an average farm size of less than 2.0 ha do not produce enough to feed the family even if a satisfactory crop was harvested. In the hill areas of Uttarakhand, about 70% of farmers were marginal possessed less than 1.0 ha of land while 15-18% farmers possess 1-2 ha. Land farming is often reduced to a supplementary source of income for the household as men seek employment elsewhere.

As a result, cultivation activities of a large proportion of farms were carried out by women who were already burdened with other daily activities. The overall status was the use of agricultural practices without modern technologies options and low

input levels for crop production. Similar studies reported by Kumar (2014) in Gujarat, Chakraborty and Paul (2014) in west Bengal, Ghosh *et al.* (2014) in Arunachal Pradesh, Kumar (2015) in Kerala, and Rana *et al.* (2016) in Garhwal Region of Uttarakhand.

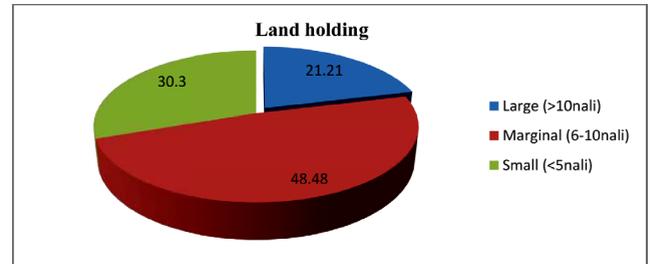


Fig. 10: Distribution of respondents on the basis of land holding

Role of women: Women were participated very actively in different activities like agriculture (90%), horticulture (85%), livestock managing (90%) and household activities (85%). Almost 50% of the rural households in the hills were headed by women as the men folk migrated to augment the farm income (Table 2).

Table 2: Role of women activities in Bhimtal block of Nainital District, Uttarakhand

Sl. No.	Activity	Role in decision making (%)	Role in participation (%)
1	Agriculture	15	90
2	Silviculture/ Horticulture	20	85
3	Livestock	25	90
5	Social organization	30	55
6	Household activities	30	85

Women played a larger role than men in home garden conservation. It was found that women were interested because they thought that homegardens could help them to earn and save money. Women also played a key role in the management of homegardens and processing of tree products for self-use as well as income generation to meet household needs. It can be said that women have a key role in homegardens management. We have attempted to illustrate how the usage of NTFPs is often determined by gender according to the socially constructed roles, where women are often considered as dominating in the case of NTFPs use for subsistence purposes while



looking at men's contribution towards the more commercial usages (Paumgarten, 2005).

It was observed that majority (70%) of the women were involved in dead dry branch collection and other home garden work. Similarly, the participation of women in homegardens management activities was explored by Akhter *et al.* (2010). They showed that women are mostly involved in homegardens management activities for substantial benefits as food security, income, health care, and environmental benefits. Women were found to be aware of homegardens conservation and tuned to motivating husbands, children, and neighbours to conserve the agro-biodiversity of homegardens. Increased involvement of women in homegardens was imperative for sustaining the livelihoods of their communities and for preserving the agro-biodiversity in homegardens (Kumar, 2017; Kumar and Tripathi, 2017). Same results were also found in the present study that women play important roles in managing homestead plots, primarily in plant production rather than in animal and fish production. Primary roles of women were crop management (74.8% of households) and harvesting (55.7%), with smaller role in marketing (36.6%). Women role in using money to pay debts and buy agricultural production inputs was less significant (Arifin *et al.*, 2012).

Awareness of the activities of forestry extension programmes: Data regarding awareness of the forestry programmes among the farmers revealed that majority of the farmers *i.e.* 49 (74.24%) were not aware of the forestry programmes and small number of farmers *i.e.* 17 (25.75%) were aware (Table 3).

Table 3: Farmer's awareness for forestry extension programmes in Bhimtal block of Nainital District, Uttarakhand

Sl. No.	Category	Number	Percentage
1	Aware	17	25.75%
2	Not aware	49	74.24%
3	Total	66	

The farmer whose main source of income was agriculture was discouraged to allocate family labour for tree planting activities. They do not have access to the latest technical information, and have a limited capacity to afford the initial cost of

tree growing. In home gardens, farmers bear the complete management responsibility for growing trees on their land. Farmers who were aware of forestry programs were more likely to decide to plant trees on the homegardens plots. About 35% of the farmers surveyed cited scarcity of financial resources as a constraint on tree planting. The dissemination of information through farmer's interaction with forestry extension programs and other organizations can influence the adoption of new technologies and forestry practices (Smit and Smithers, 1992; Besley and Case, 1993).

Assets: In the present study assets were divided in two categories: Agriculture implement and livestock. Agriculture implement include plough, Sickle and Shovel. It was found that the entire 66 household possessed 78 ploughs followed by 183 sickle and 51 shovel. Livestock included cow, goat, buffalo, hen and ox. It was found that 49 household had 87 cows, 43 household had 50 buffaloes, 3 household had 24 hens, 3 household had 4 goats and 20 household had 40 bullocks. Animal products included the animals themselves (goats, pigs and poultry) and products (milk, cheese, eggs) and were either consumed in the household or sold in a marketplace. Same results were also found in Garhwal Region of Uttarakhand (Table 4).

Table 4: Distribution of assets in Bhimtal block of Nainital District, Uttarakhand

Sl. No.	Category	Number of agriculture implements	Number of household involved
Agriculture implement			
1	Plough	78	66
2	Sickle	183	66
3	Shovel	51	66
Number of Livestock			
1	Cow	87	49
2	Buffalo	50	43
3	Hen	24	3
4	Goat	4	3
5	Bullock	40	20

It was found that all of the households *i.e.*, 72 (432) possessed shovels followed by sickles 72 (360) followed by plough 24 (24). Livestocks include cows, goats, buffalos, horse, poultry and bullocks. It was found that the 56 of household owned at least one cow followed by bullocks 40, buffalo 22, horse 19, poultry 4 and goat 2 in numbers (Rana *et al.*, 2016).



Homegardens are many times in association with the domestic animals. It increases the income of the household and help in improving their living standards. It was found that milk of animals contributed 15-20% of the income. Income through meat was noted to be 5-7% and through the carries of goods by animals was about 20-25%.

A similar study was done in Bangladesh where it was found that in the household having home gardens, poultry (64%) was the major livestock component of each household followed by goat (12%), cattle (10%), buffalo (18%), and 6% sheep (Alam and Masum, 2005). The income from the homestead biodiversity varied from Tk. 12500 to 41000 depending on household size. The total livestock population was 205 animals out of which buffaloes and cows were classified into milk and non-milk animals. It was revealed from the study that bullocks played important role in the farming due to lack of implements for ploughing, smoothing and threshing. More than 80% of the cows and buffaloes in these areas had high productivity. This high potential was further aggravated by good quality fodder through the tree species.

Source of irrigation: About 90% of the total cultivated area was rainfed whereas, irrigated area was only 10%. Canals were the major source of irrigation in the villages. Despite the presence of springs and streams, lack of irrigation water was a common constraint (Table 5).

Table 5: Source of irrigation in Bhimtal block of Nainital District, Uttarakhand

Sl. No.	Source	Number
1	Nullah/streams/Gull	6
2	Tanks	0
3	Ponds	0
4	Lift irrigation	0
5	Tube wells	0

Rana *et al.* (2016) revealed that about 91.89% area were under rainfed and only 8.11% is irrigated area of the total cultivated area. The irrigation was done from primary sources through small gulls in valley areas. Rainfed agriculture on terraced slopes is common in selected sites. Despite the presence of springs and streams, lack of water for irrigation was a common constraint. Net sown area of Uttarkashi

district was 290.19 sq. km. In Rudraprayag district only 14.02% area was under cultivation and net sown area of Rudraprayag district was around 114.30 sq. km. Total irrigated area was 44.13 sq. km. There was also evidence that irrigation of agroforestry systems in the Himalaya can be highly beneficial. For example, in the Garhwal Himalaya, the total cost of establishing an irrigated agroforestry system was 1.23 fold that of the unirrigated one, whereas the total benefit was 209-fold (Maikhuri *et al.*, 2000).

Conclusion

The present investigation was limited to Bhimtal block of Nainital district, Uttarakhand. The major purposes of homegardens are sustainable production, proper utilization and income generation, if possible, particularly in rural areas, in addition to fulfill the important ecological, social and cultural function. The implications of the different relationship men and women have with assets, in different socio-cultural contexts is often missing from the literature. Majority of the respondents *i.e.* 34 (51.51%) were middle aged followed by 20 (30.30%) in young age and 12 (18.18%) old age. Maximum number of respondents, *i.e.* 25 (37.87%) had education up to 12th followed by illiterate 17 (25.75%) followed by higher education above 12th respondent *i.e.* 14 (21.21%), whereas 10 (15.15%) were education up to 8th level.

Majority of the family belonged to the nuclear family 39 (59.09%) while only 27 (40.90%) respondent belonged to joint family. It was observed that maximum number of household families *i.e.* 26 (39.39%) belonged to farming which was the primary source of income followed by 22 (33.33%) belonged to service class (13 government, 9 sidcul) followed by 13 (19.69%) families that were dependent in the business for their livelihood, followed by wage labourers 5 (7.57%) families.

It was found that maximum number of land households *i.e.* 32 (48.48%) were marginal land followed by small landholding households 20 (30.30%), followed by large land holding 14 (21.21%). Women have participated very actively in different activities like agriculture (90%), horticulture (85%), livestock managing (90%) and household activities (85%). Almost 50% of the rural households in the hills were headed by women as the men folk migrated to augment the farm income. Data regarding awareness of the forestry programmes



among the farmers revealed that majority of the farmers *i.e.* 49 (74.24%) were not aware of the forestry programmes and small number of farmers *i.e.* 17 (25.75%) were aware. About 90% of the total cultivated area is rainfed and irrigated area is only 10%.

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APPENDIX I: INTERVIEW SCHEDULE

Part 1: General information about village

1. Name of District:
2. Name of Block/ Tehsil:
3. Name of Village:
4. Total population of village:
5. Total no. of household:

Part 2: Socio-economic and personal characteristics

1. Name:
2. Contact No.:
3. Age:

Young (21-35)	Middle (35-45)	Old (>45)

4. Caste:

General	OBC	SC/ST

5. Education:

Illiterate	Primary	Intermediate	Above 12 th

6. Relationship of the head of the household:

Father	Brother	Husband	Son	Other

7. Family type:

Nuclear	Joint

8. Family size:

Small (upto 5)	Medium (6-10)	Large (>10)

9. Type of House:

Kaccha	Pucca	Mixed



10. Occupation:

Occupation	Primary		Secondary	
	Family	Self	Family	Self
Farming				
Farming with wage Labour				
Wage labour				
Service				
Cast Occupation				
Business				
House-wife				
Any other (Specify)				

11. Land Holding:

Landless	Small (<5 nali)	Marginal (6-10 nali)	Large (>10 nali)

12. Type of land:

Un-irrigated	Irrigated	Mixed

13. Assets:

Agricultural Equipments		Livestock	
Type	Number	Type	Number

14. Annual income:

Above Poverty Line (APL)	
Below Poverty Line (BPL)	

Part 3: Trees grown by the farmers

1. Type of tree species:

Scientific name	Local name	GBH (cm) of minimum 12 trees (4 small, 4 medium and 4 large size trees) from each village	
		Total	
Slow Growing Trees			

2. Crops grown in the study site:

Scientific name	English name	Local name



3. Uses of various tree species:

Trees	Family	Uses

4. Quantity of fodder consumed by different livestock:

Name of Livestock	Quantity of fodder (kg/day/animal)

Part 4: Soil status of homegardens

1. Available nutrients in soils:

Horizon depth (cm)	Particle size (%)			Texture classes	pH	EC dSm^{-1}	OC (%)	Available Nutrient		
	Sand	Silt	Clay					N	P_2O_5	K_2O

