



Species Diversity and Structural Characteristics of High Altitudinal Home Gardens in New Tehri District of Garhwal Region, Uttarakhand

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Abstract: Homegardens, among the oldest forms of traditional farming, offer a wide range of benefits to mankind. This study examines the structural and floristic diversity of homegardens in New Tehri, Garhwal region, Uttarakhand. Using semi-structured interviews and field-level species identification, we explored the species diversity and structural composition of high-altitude homegardens across ten villages. Homegarden owners were chosen through a 40% sampling of village households, and gardens were categorized into small, marginal, and large based on their sizes. The vertical stratification of these gardens and the typical placement of trees and vegetables was also observed. Our findings reveal that the diversity of species and structural elements in hilly homegardens plays a vital role in enhancing food security and the standard of living for local communities. These gardens, with their array of plant species and unique structural components, are essential for sustainable living in hilly regions. By maintaining traditional practices and incorporating diverse plant species, homegarden owners contribute significantly to the resilience and well-being of their communities. This study underscores the importance of preserving and promoting homegardens as multifunctional agricultural systems that support both ecological balance and human livelihoods.

Keywords: High altitudinal homegardens, Species diversity, Structural composition, Tehri Garhwal

Uttarakhand, a state heavily reliant on agriculture and its allied activities for development, is renowned for its diverse range of horticultural crops. These include fruits, off-season vegetables, floricultural crops, and even medicinal and aromatic plants (Parihar et al 2016, Padalia et al 2017). Agroforestry systems in the state demonstrably contribute to economic, livelihood, and eco-environmental sustainability. Notably, these systems provide ecosystem services at various scales, thereby enhancing the livelihoods and resilience of farmers in the face of climate change (Pandey et al 2017). Many agroforestry opportunities exist on hills when trees and crops are mixed in different spatial or temporal configurations. This constitutes a sustainable substitute for monoculture farming. In the hills, several indigenous agroforestry techniques have numerous potentials to promote positive socio-economic development (Yadav et al 2019). The characteristics, diversity, and productivity of various agroforestry systems were highlighted in a few studies (Bijalwan et al 2009, 2011, 2012 and 2013) in the Garhwal region, where there was limited documentation about home gardens. Understanding the structure and function of these home gardens is necessary for formulating long-term development plans for the study area.

chosen and divided into two altitudinal categories, high and low (Table 1). An elevation range comparison between two altitudinal ranges was performed using random sampling to choose representative sites for the district.

Methodology

The crop species inventory was recorded using a homestead survey and verified through direct observation. The respondents who owned the home garden were chosen from a sample representing forty per cent of all households. In the state of Uttarakhand, land ownership is traditionally measured in units called Nali. One Nali is equivalent to 200 square meters. In this study, land holdings were classified into three categories: small (<5 Nali), marginal (6-10 Nali) and large (>10 Nali). Homegardens Farmers helped to document the local names of the species and samples of plants, and photographs were taken of the species that were yet unknown. The taxonomy and identity of the species were confirmed by the standard flora (Gaur 1999). Identified species were categorized based on their vertical growth habit, and a profile diagram was prepared. Based on their distribution in the study area, these species were classified as rare (present in 1-3 villages), uncommon (present in 4-6 villages), and common (present in 7-10 villages).

MATERIAL AND METHODS

Study area: Ten villages of the New Tehri district were

RESULTS AND DISCUSSION

Species diversity in homegardens: In the Tehri Garhwal

district, out of 397 houses in 10 villages, 200 households were engaged in home garden agroforestry. Home gardens support a diversity of flora, including ornamental plants, multipurpose trees, herbs, shrubs, and agricultural crops, among others, in their natural habitat. Among the 200 home gardens studied, *Prunus armeniaca*, *Prunus domestica*, *Prunus persica*, and *Citrus sinensis* were the most common fruit crops. In contrast, the most common multifunctional trees were *Grewia optiva*, *Celtis australis*, *Melia azedarach*, and *Ficus roxburghii*. Maun village had the maximum (90), and Haddam (Talla) village had the minimum (58) number of species (Table 2).

Citrus sinensis, *Prunus armeniaca*, *P. domestica*, and *P. persica* were the fruit crops most often found among the 200 total identified from the home gardens. The Rosaceae family contributed the most among the fruit crops with a maximum number of species (6 species), followed by the Rutaceae family. Apart from that, the home gardens of the Garhwal region contributed a total of 18 multipurpose tree species, representing twelve families and fifteen genera. Four of them are members of the Moraceae family, and the remaining

families are composed of two members: Caesalpiniaceae, Meliaceae, and Rosaceae. Twelve types of trees were used for lumber, and the remaining fourteen, multipurpose trees, were mainly used for fodder.

Nineteen species of ornamental plants from 10 families and 16 genera were identified. *Tagetes erecta*, *Zinnia elegans*, *Rosa spp.*, and *Hibiscus rosa-sinensis* were the most recorded plant species. The Apocyanaceae family had two species, the Malvaceae family with two species, and the Asteraceae family with eight species, making it the most prominent family of ornamental plants. Eight species of wild plants from six families, such as Amaranthaceae, Rosaceae, Solanaceae, Onagraceae, Oxalidaceae, and Polygonaceae, were observed in home gardens alone. *Rumex nepalensis* and *Solanum nigrum* were the most prevalent in homegardens. A total of 44 food crops, such as vegetables, cereals, pulses and oil seeds, were also recorded from the study area (Fig. 1).

Structure of homegardens: Fruit trees and multipurpose trees were generally favoured over trees grown solely for timber. Common fruit trees guaranteed fruit quality and added nutrition to people's diets, while multipurpose trees were mainly used for fuel, fodder, and small timber requirements. Both vertically and horizontally, the home gardens in the chosen villages display intricate structures.

Spatial arrangement: Fruit-bearing and multipurpose species are typically arranged in a scattering manner around homesteads, with no observable pattern of spacing. In small and marginal home gardens, limited area forced owners to adopt a significantly higher planting density, maximizing the use of their land and resulting in higher planting density.

Proper tree planting spacing was observed in large homegardens, particularly for commercial fruit trees like plum, peach, and apple. Vegetables were grown near homestead kitchens so that women could conveniently obtain them. These are arranged in rectangular blocks

Table 1. Description of the villages

Altitude category	Name of the villages	Latitude	Longitude
High altitude	Guldi	30°21'12"N	78°23'50"E
	Hadam (Talla)	30°21'35"N	78°23'05"E
	Manjyari	29°58'39"N	78°49'17"E
	Sabli (Talli)	28°42'38"N	77°45'13"E
	Dikhol Gaon Maniyar	30°20'20"N	78°23'45"E
Low altitude	Jagdahr	30°19'26"N	78°23'54"E
	Dargi	30°19'12"N	78°24'30"E
	Aarakot	30°21'53"N	78°22'37"E
	Maun	30°18'14"N	78°23'43"E
	Kotdwara	29°44'47"N	78°31'10"E

Table 2. Number of species recorded in the study area

Type of plants	Villages										Total number of species
	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	
Food crops	43	30	35	39	33	38	34	30	42	32	44
Fruit crops	10	10	10	13	10	12	12	11	18	12	20
Multi-purpose trees	10	7	8	9	11	12	13	9	15	12	18
Ornamental	14	9	11	13	14	12	11	8	10	5	19
Shrubs	4	1	2	4	3	3	3	4	2	1	3
Herbs	2	1	2	2	3	3	3	5	3	3	8
Total	83	58	68	80	74	80	76	67	90	65	112

*Abbreviations used: V1-Guldi, V2-Hadam (Talla), V3-Manjyari, V4-Sabli (Talli), V5- Dikhol Gaon maniyar, V6-Jagdhar, V7-Dargi, V8-Aarakot, V9-Maun, V10-Kotdwara

according to the available space on the ground or rooftops (Table 3). Lady's fingers were scattered, while coriander, Shimla mirch, and chillies were planted in rectangular blocks. Ornamental plants are usually planted in small containers or plastic packages with some spacing patterns. Most of them were grown on rooftops or in front of homes. The fact that sacred plants like Tulsi are noticeable on the front of a homestead suggests that the people who live in rural, hilly areas appreciate the plants highly from a religious standpoint. They are often planted in plastic kits or pots with ample space between them.

Vertical stratification: An understratum, a middle stratum, and a top stratum make up the typical three-storey vertical stratification of a home garden; each stratum has a distinct species composition and diversity (Fig. 2). Not every home garden in the study region had all three layers of vegetation, indicating a dissimilar pattern of vegetation layering.

A three-storied vertical stratification was observed in the homegardens. The understory is 1-3 m tall and a relatively dynamic layer due to seasonal changes in farming. It is distinguished by a crop composition that includes a variety of vegetables, food crops, wild shrubs, wild herbs, and ornamentals. Often occurring crop species in this layer include capsicum, chilli, Lady's fingers, onions, Arbi, coriander, cabbage, turmeric, and potatoes. Herbs like broadleaf wood sorrel and Nepal dock and shrubs like Pomegranate and Black nightshade are observed in 7-10 villages. Gudhal, Nagphani, Rose, Zinnia, and Pot Marigolds were found to be the common ornamental plants occupying the bottom layer of the strata.

The middle storey is characterised by the dominance of fruit crops, extending from around 3 m to 7 m in height. *Prunus persica*, *P. armeniaca*, *Juglans regia*, and *Citrus sinensis* were observed as the most common species in this layer, along with species like *Malus domestica* and *Pyrus communis*, which were also observed in a good number of homegardens. However, species like *Vitis vinifera*, *Annona squamosa*, and *Carica papaya* were documented very rarely by homegardens.

The top storey comes in the height range of 7 m to 15 m, and the dominance of the multipurpose trees is the main attraction of this layer. *Grewia oppositifolia* and *Celtis*

australis are the most common species in this layer. *Morus serrata* is also seen and considered a rare species in the study region.

Temporal pattern of Hilly Homegardens: Certain tree species are planted with horticultural fruit crops. Regardless of the season, annuals such as beans, colocasia, ginger, and turmeric were intermittently planted amid horticultural crops.

Species preference in Hilly Homegardens: The crop composition of home gardens generally varies, with home garden owners favouring fruit crops such as apples, plums, peaches, pears, wild apricots, and malta. Similarly, most home gardeners favour *Grewia oppositifolia* and *Celtis*

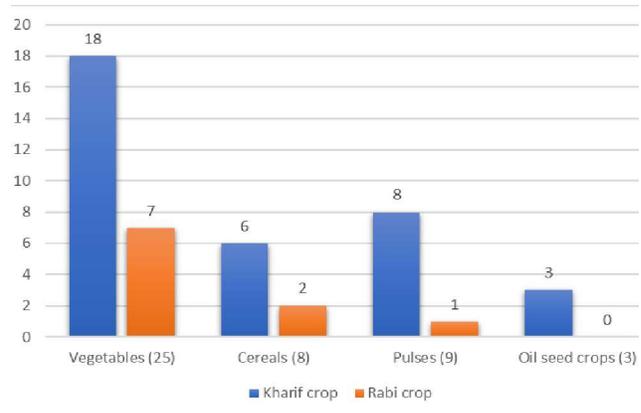


Fig. 1. Diversity of food crops in kharif and rabi seasons



Fig. 2. Species profile of home garden with vertical stratification

Table 3. Kinds of suitable spaces for crops in the homegarden

Space	Kharif season	Rabi season
Sunny space	Cucumber, Lady finger, Amaranthus,	Brinjal, Shimla Mirch, Coriander, Onion
House roof	All cucurbits	Beans
On trees	Cucurbitaceous vegetables	No crops observed
Under trees	Kidney bean	No crops observed

Table 4. Crops associated with major tree species

Tree species	Vegetables grown under trees (Major)	Creeper vegetables grown using trees as trails	
		Major	Minor
Apricot		Pointed gourd	Pumpkin
Apple	Marshu/Amranthus	French bean	Nil
Banj Oak		French bean	
Bhimal	Rice bean	Pumpkin, pointed gourd, Ribbed Gourd, French bean	Bitter gourd
Chinaberry	Taro	Cucumber	Pumpkin
Lemon	Kidney bean	Nil	Nil
Mulberry	Taro	Nil	Nil

*No minor crops were documented from the vegetables grown under trees category

australis because they are widely used as cattle feed in most home gardens. The most popular choices for understory crops in a home garden were beans, tomatoes, lady's fingers, chillies, and Shimla mirch. For food crops like bitter gourds, pointed gourds, and pumpkins, multipurpose trees like Bhimal and Dekkain were preferred as standing supports (Table 4).

Cropping pattern: The observed home gardens of the hills demonstrate a proper, time and space-bound integration of woody perennials like fruit-bearing and multipurpose species, along with or without animals. Long-duration crops predominate in small and medium-sized home gardens, whereas short-duration crops do so in more extensive home gardens. This may indicate that farmers depend on their homegrown produce for daily needs or to sustain their livelihoods. Large concentrations of fruit-bearing species, multipurpose trees, and agricultural crops are a good sign of integrated farming systems that guarantee sustained livelihood support in the study region.

Home gardens serve several functions in traditional agroforestry systems and contribute to sustainable production (George and Christopher 2020). Their amended micro-environment resembles wild forests within the homestead boundaries (Sarkar et al 2022). Understanding species richness and diversity patterns and the influencing variables in less-to-unexplored Himalayan regions provides essential insights into the drivers that shape and affect plant community structures (Sekar et al 2023). Farmers in several parts of Uttarakhand have successfully blended food crops (potato), leafy vegetables (spinach), and fruit vegetables (pumpkin), as well as fruit and fodder trees. Sunwar et al (2006) found 131 species in home gardens, including the vegetable crops *Brassica juncea* L., *Luffa cylindrica* L. *M. Roem*, *Cucurbita pepo* L., and *Dolichos lablab* L. In support of earlier research on the subject, the new study also demonstrated the presence of common spices in household

gardens, including *Allium sativum* L., *Capsicum annum* L., and *Coriandrum sativum* L. Similarly, the presence of a good number of fruit crops in home gardens in hilly areas is documented by several authors (Das and Das 2005, Srish et al 2011), showing how crucial fruit crops are to the means of subsistence for those living in rural areas.

In the whole Garhwal region of the Western Himalaya, Bhatt et al (2010) documented the top 70 MPTs, of which 13 species grow in the lower region, 24 and 31 species were commonly found in the intermediate and upper region of the Himalayan zone respectively. The results of the current study support his conclusions by showing that the MPTs, *Grewia oppositifolia* and *Celtis australis*. were widely used multipurpose trees by home gardeners as sources of fuel, fodder, and small timber.

The physical environment, ecological characteristics, socioeconomic circumstances, and cultural components of a given place influence the appearance of home gardens in different ways (Kumar and Nair 2004, Pandey et al 2007 and Alcudia-Aguilar et al 2018). The spatial arrangement of the components in the homegardens of the study provides information about the range of spaces for crops in homestead farming, including sunny locations, house roofs, trellis, the land beneath the trellis, pond banks, slightly swampy land, trees, and so on in line with Singh et al (2014). In typical Kerala homegardens, there are three to four layers: fruit trees and spice crops predominate in the middle storey, while herbaceous food crops, fodder, medicinal plants, and other crops grow on the ground layer. Tall trees and palms like coconut, teak, mahogany, and other quickly growing multipurpose species make up most of the higher canopies (Kumar and Nair 2004, Nair 2021). However, in the current study, a three storied stratification with MPTs like *Grewia oppositifolia* and *Celtis australis* comprising much of the upper canopy or top strata was observed.

Appendix 1. Plant diversity in homegardens of the study area

Scientific name	Vernacular/English/common name	Family	Status of species
Agricultural crops			
Kharif season: a) Vegetable crops			
<i>Abelmoschus esculentus</i> L.	Bhindi/Lady's finger	Malvaceae	Common
<i>Allium cepa</i> L.	Piaz/Onion	Amaryllidaceae	Common
<i>Brassica juncea</i> (L.) ssp. <i>rugosa</i> (Roxb.)	Prain Rai	Brassicaceae	Common
<i>Brassica oleracea</i> var. <i>capitata</i> L.	Bandh gobhi/Cabbage	Brassicaceae	Common
<i>Brassica oleracea</i> var. <i>botrytis</i> L.	Phulgobhi /Cauliflower	Brassicaceae	Common
<i>Capsicum frutescens</i> L.	Mirch/Chilli	Solanaceae	Common
<i>Colocasia antiquorum</i> Schott	Pindalu/Arabi	Araceae	Common
<i>Coriandrum sativum</i> L.	Dhaniya/Coriander	Apiaceae	Common
<i>Cucumis sativus</i> L.	Kakree/Cucumber	Cucurbitaceae	Common
<i>Cucurbita maxima</i> Duchesne	Kaddu/Pumpkin	Cucurbitaceae	Common
<i>Curcuma longa</i> non L.	Haldi/Turmeric	Zingiberaceae	Common
<i>Lagenaria siceraria</i> (Molina) Standley	Lauki/Bottle gourd	Cucurbitaceae	Common
<i>Luffa acutangula</i> (L.) Roxb.	Torai/Ribbed Gourd	Cucurbitaceae	Common
<i>Lycopersicon esculentum</i> Miller	Tamatar/Tomato	Solanaceae	Common
<i>Momordica charantia</i> L.	Karela/Bitter gourd	Cucurbitaceae	Common
<i>Pisum sativum</i> L.	Mattar/Pea	Fabaceae	Rare
<i>Spinacea oleracea</i> L.	Palak/Spinach	Chenopodiaceae	Common
<i>Trichosanthes dioica</i> Roxb.	Parwal/Pointed gourd	Cucurbitaceae	Rare
<i>Zingiber officinale</i> Roscoe	Adarak/Ginzer	Zingiberaceae	Common
<i>Amaranthus caudatus</i> L.	Marshu/Amranthus	Amaranthaceae	Common
<i>Echinochloa frumentacea</i> Link	Jhangora/Barnyard millet	Poaceae	Common
<i>Eleusine coracana</i> (L.) Gaertner	Manduwa/Kuretha/Finger Millet	Poaceae	Common
<i>Oryza sativa</i> L.	Paddy/ Rice	Poaceae	Common
<i>Perilla frutescens</i> (L.) Britton.	Bhangjeera	Lamiaceae	Common
<i>Zea mays</i> L.	Maize	Poaceae	Common
Kharif season: c) Pulses			
<i>Cajanus cajan</i> (L.) Hutch	Tour/Pigeon pea	Fabaceae	Common
<i>Dolichos lablab</i> (L.)	sweet Bean	Fabaceae	Common
<i>Dolichos uniflorus</i> Lam.	Gahat/Horse gram	Fabaceae	Common
<i>Phaseolus vulgaris</i> L.	Rajma /Chhemi	Fabaceae	Common
<i>Psophocarpus tetragonolabus</i>	Winged bean	Fabaceae	Common
<i>Vigna mungo</i> (L.) Hopper	Urd/Black gram	Fabaceae	Common
<i>Vigna sinensis</i> (L.) Savi ex Hasskarl	Lobia/Cow pea	Fabaceae	Common
<i>Vigna umbellata</i> (Thunb.) Ohwi & Ohashi	Ricebean/ Naurangi	Fabaceae	Common
Kharif season: c) Oil seed crops			
<i>Brassica campestris</i> ssp. <i>rapa</i> Hook. f. & Anderson	Sarson/Mustard	Brassicaceae	Common
<i>Glycine max</i> (L.) Merrill	Soybean	Fabaceae	Common
<i>Sesamum indicum</i> L.	Til/Sesame	Pedaliaceae	Common
Rabi season: a) Vegetable crops			
<i>Allium cepa</i> L.	Piaz/Onion	Amaryllidaceae	Common
<i>Allium sativum</i> L.	Lahsun/Garlic	Amaryllidaceae	Common

Cont...

Table 5. Plant diversity in homegardens of the study area

Scientific name	Vernacular/English/common name	Family	Status of species
<i>Capsicum annuum</i> L.	Shimla mirch/Capsicum	Solanaceae	Common
<i>Coriandrum sativum</i> L.	Dhaniya/Coriander	Apiaceae	Common
<i>Daucus carota</i> L.	Gajar/Carrot	Apiaceae	Common
<i>Raphanus sativus</i> L.	Muli/Radish	Brassicaceae	Common
<i>Solanum tuberosum</i> L.	Aalu/Potato	Solanaceae	Common
Rabi season: b) Cereals			
<i>Hordeum vulgare</i> L.	Jau/Barley	Poaceae	Common
<i>Triticum aestivum</i> L.	Wheat	Poaceae	Common
Rabi season: c) Pulses			
<i>Lens culinaris</i> Medikus	Musoor/Lentil	Fabaceae	Common
Fruit crops			
<i>Annona squamosa</i> L.	Sitaphal	Annonaceae	Rare
<i>Artocarpus heterophyllus</i> Lam	Kathal	Moraceae	Rare
<i>Carica papaya</i> L.	Papaya	Caricaceae	Un-Common
<i>Citrus aurantifolia</i> (Christman) Swingle	Kagazinimbu	Rutaceae	Common
<i>Citrus limon</i> (L.) Burm.f.	Lemon/Jambri	Rutaceae	Common
<i>Citrus reticulata</i>	Orange	Rutaceae	Common
<i>Citrus sinensis</i> (L.) Obeck	Malta/Sweet orange	Rutaceae	Common
<i>Embllica officinalis</i> Gaertn.	Aonala	Euphorbiaceae	Rare
<i>Juglans regia</i> L.	Akhrot/Walnut	Juglandaceae	Common
<i>Malus domestica</i> Borth	Apple	Rosaceae	Common
<i>Mangifera indica</i> L.	Mango/Aam	Anacardiaceae	Un-common
<i>Musa paradisiaca</i> L.	Kela/Banana	Musaceae	Un-common
<i>Prunus amygdalus</i> Batsch	Badam	Rosaceae	Rare
<i>Prunus armeniaca</i> L.	Wild apricot/Khumani	Rosaceae	Common
<i>Prunus domestica</i> L.	Plum	Rosaceae	Common
<i>Prunus persica</i> (L.) Batsch	Peach	Rosaceae	Common
<i>Psidium guajava</i> L.	Amrood/Guava	Myrtaceae	Un-common
<i>Punica granatum</i> L.	Pomegranate	Punicaceae	Un-common
<i>Pyrus communis</i> L.	Nashpati/Pear	Rosaceae	Un-common
<i>Vitis vinifera</i> L.	Grapes	Vitaceae	Rare
Multi-purpose trees			
<i>Alnus nepalensis</i> D.Don	Utis	Betulaceae	Rare
<i>Bauhinia purpurea</i> L.	Guriyal	Caesalpiniaceae	Rare
<i>Bauhinia variegata</i> L.	Kachnar	Caesalpiniaceae	Rare
<i>Boehmeria regulosa</i> Wedd.	Genthi	Urticaceae	Rare
<i>Celtis australis</i> L.	Khadik	Ulmaceae	Common
<i>Ficus glomarata</i> Roxb.	Umra	Moraceae	Rare
<i>Ficus palamata</i> Forsk.	Bedu	Moraceae	Rare
<i>Ficus roxburghii</i> Wallich ex Miq.	Timla	Moraceae	Common
<i>Grewia oppositifolia</i> J.R. Drummond ex Burret	Bhimal	Tiliaceae	Common
<i>Juglans regia</i> L.	Akhrot	Juglandaceae	Common
<i>Melia azedarach</i> L.	Dekkain	Meliaceae	Common
<i>Morus serrata</i> Roxb.	Shatoot	Moraceae	Common

Cont...

Table 5. Plant diversity in homegardens of the study area

Scientific name	Vernacular/English/common name	Family	Status of species
<i>Myrica esculenta</i> Buch-Ham. ex D.Don	Kaphal	Myricaceae	Rare
<i>Prunus cerasoides</i> D. Don	Painya	Rosaceae	Common
<i>Pyrus pashia</i> BuchHam. Ex D.Don	Mole	Rosaceae	Common
<i>Quercus leucotrichophora</i> A. Camus	Banj	Fagaceae	Common
<i>Rhododendron arboreum</i> Smith	Burans	Ericaceae	Rare
<i>Toona serrata</i> (Royle) M. Roemer	Tun	Meliaceae	Rare
Ornamental plants			
<i>Catharanthus rosaseae</i> (L) G. Don	Rosy periwinkle	Apocynaceae	Rare
<i>Helianthus annuus</i> L	Suraj mukhi	Asteraceae	Rare
<i>Bellis perennis</i> L	Daisy	Asteraceae	Uncommon
<i>Calendula officinalis</i> L	Pot Marigold/Marigold	Asteraceae	Common
<i>Chrysanthemum</i> sp.	Daisy Guldawadi	Asteraceae	Uncommon
<i>Columnnea crassifolia</i>	Brongn Columnnea	Gesneriaceae	Rare
<i>Gladiolus gandavensis</i>	Gladiolus	Iridaceae	Common
<i>Hibiscus rosa-sinensis</i> L	China Rose/Gudhal	Malvaceae	Common
<i>Lavatera trimestris</i> L	Silver Cup	Malvaceae	Rare
<i>Rosa</i> spp.	Gulab/Rose	Rosaceae	Common
<i>Tagetes erecta</i> L.	Marigold/Gainda	Asteraceae	Common
<i>Tropaeolum majus</i>	Nasturtium	Tropaeolaceae	Common
<i>Zinnia elegans</i> Jacq	Zinnia	Asteraceae	Common
<i>Oenothera rosea</i> L'Herit. ex Benth	Primrose	Onagraceae	Rare
<i>Opuntia</i> spp.	Nagphani	Cactaceae	Common
<i>Nerium oleander</i> L.	Kaner	Apocyanaceae	Rare
<i>Cosmos sulphureus</i> Cav.	Yellow Cosmos	Asteraceae	Rare
<i>Dahlia imperialis</i> (Linden & Andre) G.S. Bunting	Bell tree dahlia	Asteraceae	Uncommon
<i>Epipremnum aureum</i> Roetzl exortgies	Money plant	Araceae	Rare
Wild shrubs			
<i>Nerium oleander</i> L	Kaner	Myrtaceae	Rare
<i>Punica granatum</i> L.	Anar	Puniaceae	Common
<i>Ocimum gratissimum</i> L	Ram- Tulsi	Lamiaceae	Common
Wild herbs			
<i>Amaranthus viridis</i> L.	Jungli chaulai	Amaranthaceae	Uncommon
<i>Datura metel</i> L.	Dhatura	Solanaceae	Rare
<i>Fragaria nubicola</i> Lindley ex Lacaita	Wild strawberry	Rosaceae	Rare
<i>Oenothera rosea</i> L'Herit.ex Benth	Primrose	Onagraceae	Rare
<i>Oxalis latifolia</i> Humb.	Khatura	Oxalidaceae	Common
<i>Rumex hastatus</i> D.Don	Amilada	Polygonaceae	Common
<i>Rumex nepalensis</i> Sprengel	Pahadi palak	Polygonaceae	Common
<i>Solanum nigrum</i> L.	Makoi	Solanaceae	Common

CONCLUSION

The diverse species and unique structural characteristics of hilly homegardens play a crucial role in meeting the needs of households in the New Tehri district of the Garhwal region,

Uttarakhand. These traditional farming systems, with their rich variety of cultivated crops and multipurpose trees, significantly enhance tree cover and provide numerous benefits to home gardeners. The study highlights the

importance of these homegardens as essential land use systems in the hills, showcasing their horizontal and vertical diversity. This intricate structure contributes to improved food security and living standards for the local population. Therefore, it is imperative to properly document and compile records of both cultivated and non-cultivated species. Implementing practical policies to support and preserve these homegardens is essential for sustaining their benefits to the community.

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