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REVIEW ARTICLE

HOME GARDEN, ALONG WITH ITS FUNCTIONAL CATEGORY AND KEY SPECIES REPORTED IN NEPAL: A REVIEW

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ABSTRACT

Home gardening is performed from an ancient period in Nepalese societies. More than 74.5% of the population of the country is involved in an agriculture-based profession in Nepal. Home gardens include the versatile species of trees, vegetables, annual and perennial vegetables, birds and animals, medicinal herb plants on the same land units in a geometric or dimensional proportion. This paper focuses on the presentation of home garden status and present scenario and its interlinkages with home garden. Though sufficient work on home garden has been done but still focus on self-sufficiency and their role in food security has not been reported. The home garden species was found to be of great importance as they play a vital role in conservation of key species.

KEYWORDS

Agroforestry, Ethnobotany, Front garden, Nutritional category.

1. INTRODUCTION

A home garden could be a subsistence micro-environment composed of multi-species (annuals to perennials, root crops to climbers), multi-storied, multi-purpose garden situated on the brink of the homestead (Quat, NX, 1996; Watson and Eyzaguirre, 2002; Hodgkin, 2002). Home garden refers to Ghar Bagaincha, refers to the utilization of fragmented traditional land system around homestead where the home garden is primarily intended for family consumption (Shrestha et al. 2002). In Nepal, nearly 72% of householders grow vegetables in the home garden (NLSS, 2011; Gautam et al., 2004). Home gardening is performed from an ancient period in Nepalese societies. More than 74.5% of the population of the country is involved in an agriculture-based profession in Nepal (CBS, 2011). A home garden is the most common and popular practice almost in all the locality of Nepal. Home garden preserves many species of fruit trees, vegetables along with different livestock are raised in small areas. The home garden provides better nutrients, food, fuels, medicinal herbs, fodder and helps in better functioning of ecology in the meantime.

Home gardens are an indispensable part of traditional farming systems. Versatile species are cultivated to please the daily demand of households within the home gardens and are managed by relations (Shrestha et al. 2004). Furthermore, the home garden is not only the site of introduction, experimentation but also the site of domestication. A home garden is a technology that can be adapted by very poor even landless people. House garden doesn't take much land for cultivating resources. It can be grown in home estate with limited technology with limited input that can be available from the house in the form of compost, in the form of wastewater, livestock manures. Despite the small size of the home garden, they play a vital role in improving the nutritional diversity (Thapa & Rawal, 2020) and livelihoods of poor rural communities. Different cultures and customs have their local names for homestead production resources, such as Conuco in Cuba and Venezuela (Castineiras et al., 2000; Mulas et al., 2004),

Vuonnha in Vietnam (Trinh et al., 2003), Pekarangan in Indonesia state (Abdoellah et al., 2003).

Home gardens include the versatile species of trees, vegetables, annual and perennial vegetables, birds and animals, medicinal herb plants on the same land units in a geometric or dimensional proportion (Shrestha et al., 2002; Gautam et al., 2004; Suwal et al., 2005). Conventionally human beings complete their food from undomesticated crops apart from cultivated species in home gardens (Daniggelis, 2003). House members consumed 60% of the total vegetables and fruits provided by the house garden (Gautam et al., 2004). This paper focuses on the home garden status of Nepal along with diversity and composition of species reported from different regions of Nepal.

2. METHODOLOGY

The paper here presented is a review paper which is prepared as a result of information collected from different open-access national and international journals, conference papers, newspaper articles, bulletins, local research connected with us. Also, ministry websites and their databases have been used for completing the study. More focus was given to the papers presented by ethnobotanist and home garden specialist of Nepal such as Gautam et al. (2004), Suwal et al. (2005), Khanal et al. (2019), Shrestha et al. (2002).

3. FINDINGS

3.1 Status of home garden

Home garden is prominent practices and it is suitable in terai regions of Nepal than hilly regions due to rough land structure in hills. A home garden without fencing was prevalent in the context of Nepal. Domestication of

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assorted wild plant species square measure in a home garden that has contributed to extending diversity and supporting livelihoods. Homegardens may be front garden, backyard garden, sideyard garden, both-side garden (Semu, 2018). Home gardens are farm-based and common Agroforestry practices in Nepal (Regmi, 2003). Although the Home garden looks similar to a kitchen garden due to its function, structure, composition, diversity and features it is different. Nearly, 72% of households have a home garden consists of an area ranges from 2-11% of the total land-use system (Gautam et al., 2004). Also, home gardens of Nepal comprise of plants with multiple benefits like nutritional category, medicinal value, ornamental value, fodder crops, multipurpose trees for timber fuels and other various uses. Khanal et al. (2019) reported such kind of species composition in the homegarden of Katahari Rural Municipality.

3.2 Size of home garden

In Nepal, Varying size of Home garden has been found. The average size of the 415m² home garden was reported. In terai, it was found that the size of a home garden is comparatively smaller than in hills with the different landholding sizes of the household and higher land fragmentation practices in Nepal (S.S Pandey, 2008).

Similarly, the home garden of an average size of 434 m² and 402 m² has been reported in the western terai and mid-hills region of Nepal (Sunwar, 2003). Thapa & Rawal (2020) reported the size of home garden in itahari, Nepal was 45-700 m². We can find the size of home garden is generally small in other countries too (Eyzaguirre and Linares, 2004). In Ghana the size of a home garden is 0.16- 0.59 ha (Owusu et al., 1994).

3.3 Species composition of home garden

Home garden species are greatly influenced by totally different climate and ecological parameters. Climatic factors include temperature, soil type, soil structure, humidity, stresses. Aside from species of home gardens of the community unit area are influenced by allegiance, transhumance, space of home gardens and prosperity (Shrestha et al., 2002; Sunwar, 2003). A home garden is well-linked for vegetables (30-47% of total species), followed by fruit trees (13-20%), decorative plants (4-30%), fodder (5-10%) and spices (5-9%; Gautam et al., 2005).

Fodder has the second richest diversity after the vegetable crops in Ilam and Gulmi, which defines the primary importance of placental mammal in these sites. On the opposite hand, fruit diversity is more than fodder in Jhapa. Several species in the home garden have their own socio-cultural and non-secular significance (Soemarwoto and Conway, 1992; Hodel et al., 1999; Shrestha et al., 2002; Sunwar, 2003). Seeds of home garden species are produced by home gardeners themselves (Rana et al., 1998; Shrestha et al., 1998). The diversity of species reported in home gardens of different places of Nepal (Gautam et al., 2009; Khanal et al., 2019; Pokhrel et al., 2015) are presented in figure 1.

Figure 1: Diversity of species reported from different places of Nepal

3.4 Key species and criteria for selection of key species

Key species are the important traditional species that have a significant role in the ecological community. Some of the key species of Nepal along with its criteria to be fulfilled for selection of key species is shown in (Table1.) adapted from (Gautam et al., 2009). Khanal et al. (2019) reported 5 key species in home gardens of katahari RM. and Gautam et al. (2009) reported 24 key species in Nepal.

Table 1: Criteria for selection of key species and species reported in Nepal.

Parameters	Criteria considered for key species	Examples from Nepalese home garden agroecosystem
Origin	Crop species that are locally important native or traditional plant species	Traditional vegetable crops such as broad leaf mustard, sponge gourds, taro, radish, garlic, ginger and coriander, etc.
Distribution	Species grown frequently and extensively in home garden	Crops grown frequently in large areas by many farmers such as taro, radish, cauliflower, broad leaf mustard, etc.
Representative of major trophic levels	Species grown frequently from each trophic groups	Nepalese home garden compose of one to three species/varieties of vegetables, fruits, spices and herbs, fodder, crops, ornamentals, medicinal plants, biofertilizer/pesticides plants, etc
Intraspecific diversity	Comparative richness in crop genetic diversity	Culturally important species has rich varietal diversity such as hyacinth bean, chillies, sponge gourd, taro, chayote, etc.
Food culture	Unique to common Nepalese food culture	Depending upon seasons, <i>Brassica juncea</i> (broadleaf mustard), radish, amaranth, cauliflower, sponge gourds, beans, chillies, taro, pumpkin, brinjal, onion, garlic, beans, yam, chayote, carrots, bitter gourd, cowpea, bottle gourd, cucumber, <i>githa</i> , etc.
Sociocultural value	Unique to specific ethnic food culture	Pidar (<i>Trewia nudiflora</i> L.), Kundruk (<i>Coccinea grandis</i> L.), Poi sag (<i>Basella alba</i> L.), lapha sag (<i>Malva verticillata</i> L.) and oal (<i>Amorphophallus campanulatus</i> L.) associated with indigenous Rajbansi/Tajpuriya/Tharu and other communities in Tarai region; In mountainous areas, people of Rai Limbu Tibeto-Burmese stock grow Jaringo (<i>Phytolacca acinosa</i> L.) used as a herb in a grain and legume soup; Chiuri (<i>Aesandra butyracea</i>) is closely associated with the lifestyle of Tribal Chepang ethnic group. (Sthapit et al. 2008)
Religious value	Specific to customs, traditions and rituals of various faith	Tulsi (<i>Ocimum sanctum</i> L.), Pipal (<i>Ficus spp.</i>), Babari (<i>Ocimum basilicum</i> L.), Dubo (<i>Cynodon dactylon</i> L.), bel tree (<i>Aegle marmelos</i> L.), etc.
Economic value	Potential for economic importance locally and nationally	In Ilam, chayote (<i>Sechium edule</i>), akabare chillies (<i>Capsicum microcarpum</i> L.), Jerusalem cherry (<i>Solanum anguivi</i> L.), Lapsi (<i>Choerospondia axillaries</i> L.), Cardamom (<i>Elettaria cardamomum</i> L.), Timur (<i>Xanthoxylum armatum</i> L.), broom grass, etc. are important to generate income through organized local and regional marketing.
Availability	Traits with multiple harvests, perennials plants, low production cost, uses of multiple parts	Kalo Kauli (<i>Brassica spp.</i>), a perennial cauliflower; <i>Dolichos lablab</i> winter beans; cowpeas, taro and chayote, drumstick (<i>Moringa oleifera</i> L.), tree tomato (<i>Cyphomandra betacea</i> L.), cherry tomato (<i>Lycopersicon spp.</i>), etc.
Integrated with holistic farming system	Species that support ecosystem services and functions; safe and healthy family production; ecological agriculture	Multipurpose fruits, fodder, trees, shrubs, climbers, roots and tubers, shades, flowering trees, mango, litchi, citrus, peach, tea, kadam (<i>Anthocephalus cadamba</i> L.), etc. for pollinators such as bees, insects, birds, etc.

Source: Gautam et al. (2009)

3.5 Home garden as a source of livelihood

In rural areas of Nepal, which covers around 90% of the total population (CBS 1999), home garden is the most and foremost source of basic as well as additional needs. In Nepal, around 85-94% of households lean on house gardens for the supply of vegetables throughout a year in western hills (Shrestha and Gurung 1997). Moreover, 57-81% of householders have fruit trees in their home gardens. The variety of annuals and perennial crops and vegetables are cultivated around the house stead that provides fresh, hygienic, and nutritional food. It helps to bring a standard lifestyle of farmers and uplift the economic status. By growing multi-species of crops and vegetables in micro-environment, minimizes the scarcity problem similarly home garden bears a wide variety of green leafy vegetables, which are substantial in micronutrients (Agte et al., 2000).

3.6 Dietary diversity and health value

Improper diet of leafy vegetables, fruits, animal protein leads to xerophthalmia (A progressive eye disease caused by vitamin A deficiency). Although the diet rich in energy but missing essential components of nutrient can lead to a variety of health problems, heart disease, diabetes, stunted or defective bone growth, skin disorders, and even obesity (Frison, Cherfas, Eyzaguirre, & Johns, 2004). These circumstances are no longer correlated with prosperity; they are on the rise among poverty-stricken people from built-up area. A multiple diet proffers nutritional cushions, and there should be a key plans ameliorate to tackle this destructive direction (Johns & Sthapit, 2004).

The value of home gardens for family health is predominant as home gardens maintain wide range of genetic diversity that extends economic sector, dietary assortment and nutritional proportion for small earnings households in both rural and urban communities (Hellen Keller International, 2001). Furthermore, home gardens balance a wide range of herbs and medicines for alacritous household remedies (Agnihotri et al., 2004; Trinh et al., 2003).

Figure 2: Inter linkage among miscellaneous components in Nepalese home gardens

3.7 Ecosystem functions and services

Home gardens are the multi-storey combination that contributes many goods and services of environmental, economic, social and cultural importance. Nepalese home gardens are linked with mixed farming techniques, so that both fodder trees and livestock are paramount ingredients.

A healthy home garden not only expands the multiplicity of soil micro-organisms and predators of natural-born foe, but also expands communities of pollinators; fruit setting and gene migration (Westerkamp & Gottsberger, 2000). The study shows that the closer the coffee bushes are planted to the home gardens, the higher the healthy quality and quantity of beans they manufacture, due to higher pollination by wild bees (Shanahan, 2004).

4. CONCLUSION

The follow of raising home gardens was supported centuries of accumulative mental objects, practices and relevancy species and it's environmental and ecological demand. There is a gross lack of basics as well as scientific information about the home garden among the farmers to this date. This is the reason why the standard size of the home garden as per the report is not maintained in any region of our country.

Therefore, the urgent surge for systematic research to generate information upon which future strategy for home garden in Nepal can be based on. Any household can use the technique of home gardening even the poor or landless, accessible and limited resources are need which eases to provide a secure livelihood.

It not only helps in sustaining the livelihood of farmers, the principal purpose, adds improvement in micro-niches and microclimate of the environment, in short, but it also helps in improving the biodiversity and species diversity of the locality. Several studies have documented ethnobotanical species ranging from forestry to horticulture and agriculture mainly for multipurpose.

Most of the home gardens are done without fencing which reduces the security of the crops. Binding all into a single thread, the article is all about capitalizing the contribution and values of the home garden to food security, income, and livelihoods of the people and conservation of plant genetic resources on-farm. Thus, more researches are to be done in accessing the information about the home garden as all parts of our country possess a difference in diversity of species and its uses among different ethnic communities.

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