

Comparative Participation of Rural Women in Agroforestry Home Gardens in Kumaun Himalaya, Uttarakhand, India

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Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

Women are considered to be the backbone of hill economy in Uttarakhand state. Women's contribution to agricultural activities like cropping, composting, winnowing, animal tending and other related work is far greater than the men. In the present study, an attempt has been made to analyse participation of rural women in homegarden agroforestry in Kumaun Himalaya, India. Two blocks each were selected in hill and bhabhar region and in each block five villages were selected at random. Participatory interview and direct observation technique was used to collect gender specific data and the sample of the study consisted of 100 farm families in each block. In this region, except ploughing, women carry out almost all crop production tasks to help their menfolk. In hill 68% women were participating independently while in bhabhar only 36% were working independently. Participation of rural women was greater in hill compared to bhabhar. The high level of participation of rural women in homegarden agroforestry makes it necessary to formulate policies and strategies to strengthen the technical knowledge of rural women in homegarden management.

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1. INTRODUCTION

Kumaun Himalayan region of Uttarakhand state, India is a diverse agro-ecological zone with a long history of agriculture. It is an important centre of domesticated plants and a centre of diversification for many important crops. The region's rich crop resources have traditionally conserved in crop fields and homegardens [1,2]. In ecological terms, homegardens are viewed as managed ecosystems with dynamic interplay biotic, abiotic and socio-cultural factors. These homegardens serve critical functions in fulfilling community and household needs such as food provision and food security, ensuring primary health care, income generation and fulfilling other utility functions. Home gardens have been described as 'living genebanks' in which a variety of germplasm, in the form of indigenous varieties, landraces and rare species, thrives side by side and has been preserved through generations. Its importance for *in situ* conservation of the valuable agro biodiversity and sustainability of the surrounding ecosystem is well appreciated [3,4].

A homegarden is often a shared activity within a household [5,6]. In India, women play important roles in the management of homegardens [7,8]. Rural women engaged in agriculture constitute 78% of all women in regular work [9]. They help in production of food crops, maintenance of natural resources in their surroundings and responsibilities of domestic work within the homegardens [10]. They work harder and spend more time than men and play vital roles in conservation and management of sustainable ecosystem [11]. The role of women in management of sustainable agroforestry needs to be documented and certified so as to address the issues related to women empowerment as well as rural development. Present study describes participation of rural women in homegarden agroforestry systems of Kumaun Himalaya, Uttarakhand, India.

2. MATERIALS AND METHODS

Uttarakhand state forms a part of Western Himalaya and is predominantly hilly and mountainous. The study area selected for the present study was located in Kumaun Himalayan region of Uttarakhand state, India. The Kumaun Himalaya forms the northwestern part of the central Himalayan region and lies between

28°44'-30°49'N latitudes and 78°45'-85°5' E longitudes. Two blocks each were selected in Bhabhar (Kotabag and Haldwani) and hill (Bhimtal and Okhalkanda) belt. In each block five villages were randomly selected on the basis of landholding categories. In each village, 50.0% households engaged in homegarden agroforestry were randomly selected for collection of data. Participatory interview with head (male/female) of the family was conducted to collect gender specific information (total 100 farm families were interviewed in each block). Data were analysed using frequency, percentage and mean. Direct observation method was used to determine types of homegardens existing in the study area. SPSS software was used for analyzing the data.

3. RESULTS AND DISCUSSION

3.1 Types of Homegardens in Kumaun Himalaya

In this region, a large number of cultivated plants and domestic animal species are maintained in homegardens, traditionally known by different vernacular names. The most common vernacular for the term homegarden is "Bara" indicating closeness of cultivation plot to the house. In Kumaun Himalaya common locations for gardens in relation to house are backyards, front yards, side yards and those that almost encircle the house (Figs. 1a and b). The homegardens are plots near living houses. Common garden sizes ranges from 0.01 ha to more than 0.05ha but at some places homegarden as small as 0.002 ha and as large as 0.09 ha have been recorded (Figs. 1c and d). Larger gardens approaching the upper limit are more frequent in household where the homegarden is the only cultivated land available.

In different agro-ecological zones, local people have developed types of homegarden with considerable diversity and flexibility that facilitates production of the major livelihood necessities. According to Reyes-Garcia et al. [5] in terms of species composition women managed homegardens are more diverse and richer than men's and shared homegardens. While men cultivate only edible plants, women cultivate a wide variety of herbs, vegetables, spices and tree crops for multiple uses. These products contribute substantially to the nutritional needs of the family all the year round.



(a) Front yard home garden



(b) Backyard and side home garden



(c) Small home garden



(d) Large home garden



(e) Banana tree in home garden



(f) Cucumber vine on fruit tree

Fig. 1. Types of homegardens in rural area of Kumaun Himalaya

In terms of dietary supplement, each home garden provides various nutritional requirements starchy, proteinaceous, oil bearing, leafy and other categories of crops are proportionately mixed to serve their primary home functions. The fertility of the soil of home garden is better than the croplands away from home. Therefore, crops with better yield and market values are given priority to grow around the homestead. This cultural heritage passed from generation to generation through action. The spatial and temporal arrangement of crops in these home gardens is complex further broadening the dimensions for analysis of the biological diversity.

Depending upon the climatic zones perennial fruit tree like citrus (*Citrus* spp.), banana (*Musa* sp.), mango (*Megifera indica*), litchi (*Litcea chinensis*), peach (*Prunus persica*), apple (*Pyrus malus*), plum (*Prunus domestica*), pear (*Pyrus communis*), apricot (*Prunus armeniaca*) etc are planted (Fig. 1e) while naturally growing fodder tree like ficus (*Ficus pamata*), kachnar (*Bauhinia variegata*), bhemal (*Grewia optiva*), oak (*Quercus* spp.) or fuel wood tree like chir pine (*Pinus roxburghii*), ciltis (*Celtis australis*) are maintained on bunds and margins of terraced field. Seasonal crops like potato (*Solenum tuberosum*), garlic (*Allium Sativa*), onion (*Allium cepa*), zinger

(*Zingiber officinale*), haldi (*Curcuma longa*), coriander (*Coriandrum sativum*), spinach (*Spinacea oleracea*), reddish (*Raphanus sativus*), bringal (*Solenum melongena*) etc are grown between the trees. The vines of bottle gourds (*Lagenaria siceraria*), pumpkin (*Cucurbita maxima*), bitter gourd (*Momordica charantia*) beans (*Vicia faba*) etc are arranged to climb on trees (Fig. 1f), fence and walls of terraced fields. Large plots without trees near house are used to grow cash crops like pepper (*Capsicum annum*), tomato (*Lycopersicum esculantum*), pea (*Pisum sativum*).

3.2 Role of Rural Women in Home Gardens

In Kumaun Himalayan region of Uttarakhand state, India women carry out most of the task from sowing to harvesting (Fig. 2) while men performed particular task such as land clearing, ploughing, tree pruning, and transportation of homegarden products. Talukder et al. [12] also reported that most of the tasks in home gardens were carried out by women in rural Bangladesh. Except ploughing, women carry out almost all crop production tasks to help their men folk. In Kumaun Himalaya 68.0% women in hill area independently performed home garden agro forestry activities with full responsibility while 26.0% women jointly worked with men and 6.0% women did not participated. On the other hand in Bhabhar, 40.0% women were not participating in home garden agro forestry activities, 36.0% women working independently with full responsibilities and 24.0% working jointly with men (Fig. 3).

Selection of crop or vegetable for home gardening is done in consultation with the household members and majority of the decision making is given to women particularly in hill area. The results obtained from the surveyed home gardens indicated that 65.0% of the interviewed household heads responded that women decide what to grow in home gardens while 35.0% of them claimed that it is the men who decide what to grow in home gardens. A study done by Sahayog (NGO at Almora district of Uttarakhand, 1995) and Das [13] reported that women in hill area have excellent knowledge about collection, storage and use of seeds. Finerman and Sackett [14] also reported that women of Saraguro established and managed home gardens and made decisions about what to grow and how to utilize garden products.

In hill area, about 55.0% of the women independently participated in cultivation activities

such as seed selection, nursery preparation, transplanting, weeding, watering, application of manure/ fertilizer etc while 40.0% women were participating jointly with men with 5.0% had partial responsibility. In Bhabhar area 45.0% women were participated independently, 35.0% women jointly involved with men and 20.0% women were not participating (Fig. 4a). Kishtwaria [15] reported that women in hill of Himachal Pradesh perform crop production activities viz. transplanting, cutting/ uprooting, weeding and transporting manure etc independently.

On an average, 76.0% of women in hill area were independently performing the post harvest management activities such as, cutting, drying, threshing, winnowing, management of surplus product, marketing and management of cash while 24.0% of the women jointly performed the role and sharing responsibilities with men while in Bhabhar only 26.0% of the women were involved independently in post harvest activities, about 35% were participated jointly with men and 39% were not involved (Fig. 4b). Hill women contributed more in home garden management activities as compared to Tarai and Bhabhar women [9,11].

3.3 Characteristics of Rural Women Participating in Home Garden

In this region age of rural women participating in home garden agro forestry ranged from 18 to 80 years. Age of respondent was categorized as young (18-35 yrs), middle (36- 50 yrs) and upper (< 50 years) age group. Number of participating women was significantly higher in middle group (42.5%) as compared to young (35%) and upper (22%) age group. In hill, young girls aged below 18 years also helped in home garden activities such as watering, weeding, collection of fruits, vegetables. Education is one important factor in acceptance, rejection, adoption and dissemination of useful information for the benefit of target audience. About 17.5% of women participating in home garden management were illiterate, 57.5% were educated up to secondary level while only 25.0% attained education higher than secondary level. During field survey it was observed that women in hill area were less educated than women in bhabhar area yet they have better knowledge of home garden management. About 35% women have small family size (< 4), 42.5% have medium family size (5-7) and 22% have large family size (> 7). Home garden size was small (< 0.005 ha) in 7.5% cases, medium (0.01-0.03 ha) in 62.5% cases and large (> 0.03ha) in 30% cases.

According to Patterson [16] home gardens are examples of women's enterprises that functions based on inter-intra household knowledge, labour, and exchange of plant materials and marketability of produce. Results of the present study indicate that women participate more than men in growing and managing home gardens particularly in hill area. Through their participation

in intensive homegarden production they contribute to agricultural growth. Therefore, the introduction of crop production technologies in home garden could serve as one means for the rural poor women to enhance their income while contributing to the growth of agriculture in the region.



i. Transplanting



ii. Weeding



iii. Digging (harvesting) Colocasia



iv. Collecting fodder for livestock

Fig. 2. Rural women engaged in homegarden activities

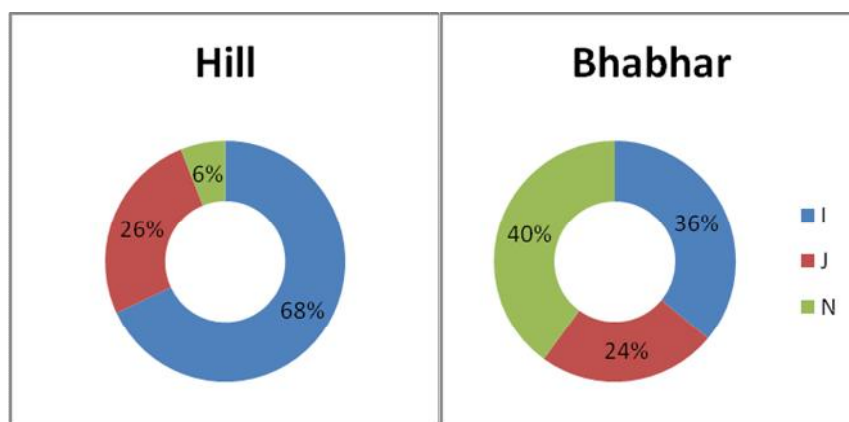


Fig. 3. Participation (%) of women in homegarden agroforestry system of Kumaun Himalaya
(I = independently; J = jointly with men and N = not participating)

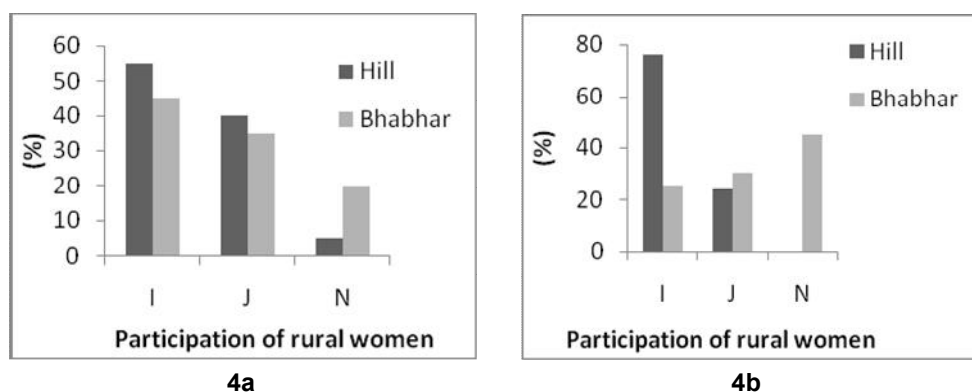


Fig. 4. Participation of rural women in cultivation activity (a) and post harvest management activity (b)

I= independently; J= jointly with men and N= not participating

4. CONCLUSION

The overall participation of rural women in home garden management was higher in hill region than in bhabhar region. However, women independently performed home garden activities and were responsible for most of the activities in majority of the households. Rural women particularly in hill region are the backbone of the agriculture and work hard and spent more time than men and perform vital role in conservation and management of sustainable village ecosystem. So, there is an urgent need to strengthen extension work by Government organizations (GOs) and Non- Government organizations (NGOs) to empower women with technological knowledge of rural women to overcome obstacle in home garden management.

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COMPETING INTERESTS

Author has declared that no competing interests exist.

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