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## Agro-biodiversity Conservation Practices in Tropical Region - A study from Kailali District, Western Nepal

Chandra P. Pokhrel<sup>1</sup> and Kazuo Ando<sup>2\*</sup>

<sup>1</sup>Central Department of Botany, Tribhuvan University, Kirtipur, Kathmandu, Nepal;

<sup>2</sup>Center for South East Asia Studies, Kyoto University, Japan\* correspondence author

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### 1. Introduction

Agro-biodiversity, or agricultural biodiversity, includes all the components of biological diversity of relevance to food and agriculture, as well as the components of biological diversity that constitute the agro-ecosystem: the variety and variability of animals, plants and micro organisms, at the genetic, species and ecosystem levels, which sustain the functions, structure and processes of the agro-ecosystem. Indigenous and traditional agricultural communities throughout the world depend on, and are custodians of, agro-biodiversity maintained within agricultural landscapes through various forms of traditional resource management.

Homegarden-a component of agro-biodiversity is an important source of food security and livelihoods as it supplies diversified vegetables and fruits rich in micronutrients, provides spices and herbs to meet culinary and cultural requirements, provides medicines for relief, ecosystem services and income. Despite its small area, a homegarden is a biodiversity rich production system and should be considered as a viable unit of on farm biodiversity conservation. Moreover, it is an important contribution to sustainable agricultural production, because of their potential to meet several economic, social, ecological and institutional conditions for sustainability. The aim of the present study is to document the cultivated plant species in the homestead and also investigate the plant diversity according to different ethnic community.

### 2. Methodology

#### Study site

The study was conducted in September and October, 2012 in Dhangadhi Municipality which is located in Kailali district of far western part of Nepal. The adjacent villages of the site are Jali VDC in east, Jai in south, Kailali in west and Beladevi VDC in north. This area lies in the latitude of 28° 41' 40" North and longitude of 80° 35' 35" East. The study site is situated at the elevation of 187 m above sea level. The area is favored with hot and humid summer, and cool and dry winter. The maximum temperature is 37.2 °C and minimum temperature is 7.1 °C. Soil of the study site is sandy, lomy and homogenous throughout the area. The main ethnic groups of the study area are Tharu (Rana Tharu, Chaudhari) along with some Bhramins, Chettries and Dalits (Socially disadvantaged groups). The major occupation of the people of study area is Agriculture.

#### Methods

A total 40 households were surveyed during the field study. Both primary and secondary information were collected. Semi-structured questionnaires focus group discussion, key informant interview and field observations methods were applied during the study. Household survey was conducted to document the information on plant species. Different plant species that occurred within the homestead (homegardens) were recorded. Plant species are categorized as fruits, vegetable and others (medicinal and ornamental) according to the information provided by households and also focus group discussion and key informants were consulted for additional information. Plants identified in the field were recorded with their local as well as scientific names. Unidentified species were made herbarium and got identified at Central Department of Botany, Tribhuvan University.

The Shannon-Wiener index was calculated to assess the fruit, vegetable and medicinal and ornamental

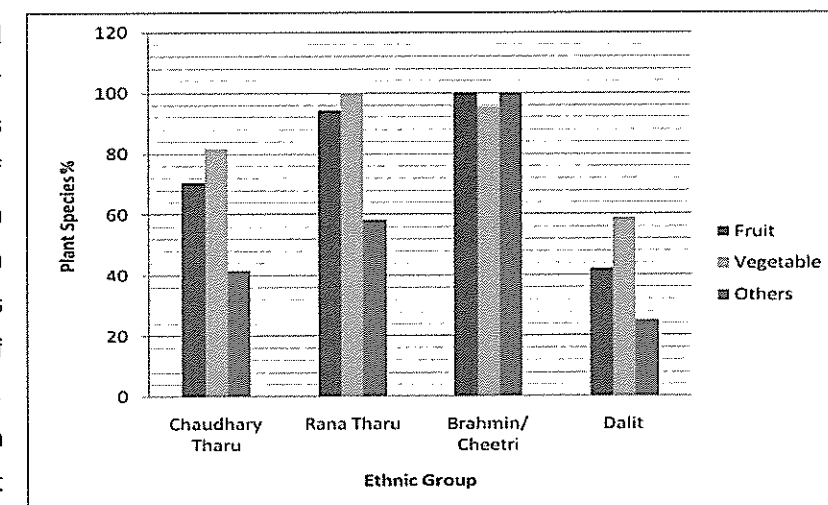
species diversity in homegardens of different casts and index of species evenness was also determined to analyze the equitability of occurrence of species across the homegardens following the equations used by Wezel and Bender.

### 3. Results and Discussion

Agriculture, the main source of employment in rural countries, is facing three challenges to ensure food security, reduce poverty and promote sustainable management of natural resources. The homegardens are an integral part in a typical Nepalese homestead and play a crucial role in supplying household members with diversity of different food crops. A total of 53 different plant species (Fruits, Vegetables and Others) from 29 families were recorded in homestead of study sites. Out of the total of 53 cultivated species, the highest species were vegetable (41.5 % of all species) followed by fruits (35.8%) and others (ornamentals and medicinal) (22.6%). Vegetables are the major component of the homestead. The vegetable such as *Lycopersicon esculantum*, *Solanum tuberosum*, *Lagenaria siceraria*, *Phaseolus vulgaris*, *Raphanus sativus*, *Allium cepa*, *Allium sativum*, *Capsicum annum*, *Cucumis sativus* were observed in all studied households. Furthermore, among the 19 recorded fruits *Mangifera indica*, *Psidium guajava*, *Citrus sp.*, *Musa paradisiaca*, *Carica sp.* were also recorded from all homegardens. Similarly *Malva viscosa* sp. and *Tagetes sp.* were also recorded in all households. The major ethnic compositions of the study area are Tharu (Chaudhary and Rana), Brahmen and Cheetri, and Dalit. The study revealed that characterize and number of plant species is mainly influenced by different ethnic community (Presented in the figure below). The highest number of fruit and medicinal and ornamental plant species were recorded from the homestead of Brahmin / Cheetri group, followed by Rana Tharu and Chaudhary Tharu respectively. Whereas highest number of vegetables species were recorded from the homestead of Rana Tharu, followed by Brahmin /Cheetri and Chaudhary Tharu. Least number of plant species was observed from homestead of Dalit community.

### 4. Conclusion

Agro-biodiversity in Nepal contributes to food supply for many people in rural areas because of a high diversity of cultivated plant species which include species for human nutrition and livelihoods. It is the part of crop insurance of rural farmers of Nepal. Thus, promotion of homegardens can also be an important subject for agricultural production in



rural areas. In the study highest number of cultivated vegetables plant species were recorded followed by fruit and medicinal and ornamental. Different ethnic communities have different number of plant species. Rana tharu and Brahmin / Chetteri have the largest number of cultivated plant species in their homestead/ homegarden. Diversity of plant species not only supply food and nutritional security, livelihoods but can contribute to sustainable land use in rural area because pressure on fragile land or forested areas can be reduced or minimized.

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〒156-8502 東京都世田谷区桜丘1-1-1

東京農業大学国際農業開発学科内

TEL：03-5477-2736 FAX：03-5477-4032

印刷：佐藤印刷株式会社

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