Tropical Plant Research
An International Journal
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ISSN (E): 2349 – 1183
ISSN (P): 2349 – 9265
4(2): 286–296, 2017
DOI: 10.22271/tpr.2017.v4.i2.038

Research article

Plants struggling to receive proper identity at Bhadaure Tamagi of Kaski district, Nepal

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[Accepted: 19 July 2017]

Abstract: Neglected and underutilized plant species have a potential to contribute to food security and poverty alleviation. Most plant species consumed as food across the world are neglected and underutilized. These includes plants with edible fruits, grains, leaves, nuts, oils, roots and tubers, fibers, medicines, spices, stimulants and their derived products. Until now, there was very limited information available on the utility of plants for different purposes in the study area. Thus, to minimize the gaps, the research was carried out at Bhadaure village of Kaski District, Nepal. Data were collected from the different sites through the application of Participatory Research Appraisal methods *i.e.* direct observation, household survey, individual interviews and key informant interview. This was followed by the field visit with the help of community members where collection of the plant samples and capturing of the photograph was done. Then each species was evaluated for nine parameters (extent of the production, extent of consumption, degree of consumption, perceived nutritional value, cultural importance, medicinal properties, market use, market value and contribution to household income). From the community interaction and field visit a list of 66 plants were extracted as underutilized plants in the study area. They were from various habitats. About 55% of the species were collected from natural or semi-natural vegetation, particularly forest. 33% of the plants were used for vegetable. The collection or harvesting period of the recorded plant were varies on the case of species. The availability of wild plants has also declined drastically. Young generation was not so much interested in these plants. Some of these plants were observed on market places being sold at competitive prices. Specific household members consume these plants. Commercialization of these fruits is mainly undertaken by the low resource base farmers.

Keywords: Food security - Neglected and underutilized plant - Participatory research appraisal - Farmer.

[Cite as: Kunwar BB (2017) Plants struggling to receive proper identity at Bhadaure Tamagi of Kaski district, Nepal. *Tropical Plant Research* 4(2): 286–296]

INTRODUCTION

There are 350,000 plant species recorded in the world, out of them 80,000 species are edible for humans. The cultivated plant species are represented from 55 families (Fuleky 2009). For both the poorest and the riches socio-economic groups of the people have received important sources of protein, fats, vitamins, and minerals from many thousands of wild plant species (Akhtar 2001, ICIMOD 2010, Aryal 2010). In many parts of the world, the use of wild plants as a vegetable and fruits is very common (Bussmann *et al.* 2006, Cavender 2006, Pieroni *et al*. 2007, Dutta *et al.* 2016). Most plant species that are used for food across the globe are neglected and underutilized. Search for the alternative plants that are edible for humans as food or fruits havebeen done through the process of trials and errors by various tribes, in turn domesticating the useful plants (Prescott & Prescott 1990, Scherrer *et al*. 2005, Bajpai *et al.* 2016, Dutta *et al.* 2016). Current estimation of more than 7,000 plant species are cultivated or harvested from the wild for food in global scale.

In Nepal, estimation of plants between 6,500 species of flowering plants (WCMC 1994) and 5,800 (Hara *et al.* 1978, 1979, 1982) have been done, out of which 1,500 are considered beneficial (Manandhar 2002). Out of these, 651 species are economically useful including 440 species of wild food plants and about 200 plant species

Received: 31 March 2017 Published online: 31 July 2017
https://doi.org/10.22271/tpr.2017.v4.i2.038

are consumed as vegetables (Manandhar 1982), most of them, however, are regarded underutilized or neglected. The history of the utilization of the plant resources in Nepal dates back to the work of Banerji (1955). After his work, some workers continued the ethnobotanical study in the 60's and 70's (Pandey 1964, Dobremez 1976). Neglected and Underutilized plant species (NUS) are those species that have a potential to contribute to food security and poverty alleviation and which has not been fully exploited. Increased public awareness about underutilized species was prompted by the Convention on Biological Diversity and the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (FAO 1996), The Consultative Group on International Agricultural Research (CGIAR 2004) had initiated to include underutilized species as a majorresearch agenda since 2004.

The plant struggling to receive proper identification but have benefitted to the people or NUS have received negligible attention from research and development, and there is little scientific information about them and they are described as "neglected" (Eyzaguirre *et al.* 1999). These plant species have value addition aspects to diversify the use and shelf-live. Some are highly important for food security; others may prove to have greater potential for income generation, for environmental services such as soil fertility maintenance, scenic and biological pest control. The production and consumption of neglected and underutilized species prop up higher incomes and in good health nutrition and preserves the cookery and cultural traditions of indigenous communities. In many instances, these species are the only crops that can cope with harsh environments unfit for other crops. The coverage of these plants is wide, including plants that provide edible fruits, grains, leaves, nuts, oils, roots and tubers, fibers, medicines, spices, stimulants and their derived products. Therefore, this demands their promotion which should be done in a sustainable manner. Food security and poverty alleviation in rural communities can be strategically improved by diversifying the existing farming systems. Commercialization of these plants is mainly undertaken by the low resource base farmers. The NUS have been overlooked by scientific research and development workers despite the important role they can play in terms of food provision and food culture of the rural poor and livelihoods of many rural and urban communities but their use in terms of diversification is low and subsequently classified as underutilized.

Lack of attention of NUS by stakeholders has resulted in genetic erosion and ultimately their vanishing, which are further restricting development options for the poor. Many underutilized species are particularly beneficial as food and medicine, especially in marginal areas, where they have been selected to withstand stress conditions and contribute to sustainable production with low-cost inputs. Unfortunately, these species have been neglected by researchers in the past and, consequently, the information available regarding their agronomy, yield improvement potential and quality is insufficient.

Historically, a large number 100,000 plant species have been used regularly for food, fiber, industrial, cultural and medicinal purposes and is recognized as being underutilized. However, as a result of modernization of agricultural practices, many of these plant species have been neglected due to their being held in low prize and some to the level that genetic erosion of their gene pools has become extremely severe. At least 7,000 cultivated plant species are currently in use around the world (FAO 2007). By doing this study, the awareness level of the community people regarding in NUS and its importance had been raised to a certain extent. It is recommended that follow-up interventions need to be carried out through on-farm farmer managed trials and value addition technologies on these plants. Priority should be given to exploration, collection, conservation and promotion of both production and value addition technology of these species in this region. There is a wide range of under-utilized plant species which can be cultivated and/or improved and processed. However, owing to the lack of adequate knowledge and other technologies, full potential has not been exploited yet. Addressing these views will be highly relevant to the development of an improved NUS agricultural portfolio. Despite their importance for subsistence, income generation, and culture, the use of traditional vegetables is declining at an alarming rate in all areas of Nepal, combined with genetic and cultural erosion. This occurs particularly in easily accessible regions, where commercialization of the production is possible. The nutritional value of the wild plant species needs to be analyzed and recognized. In addition, their utilization should be promoted to improve livelihoods in rural and urban Nepal (Joshi *et al.* 2007).

There was limited information on the status of the NUS in the study area and that limits their promotion along with their product value chain in terms of exploiting production potential, processing, effective and efficient marketing. The purpose of this study was, therefore, to identify the underutilized plants in the studied area, the constraints, and assess the potential, production and utilization of these plants.

MATERIAL AND METHODOLOGY

Data were collected during expeditions from different sites through the application of Participatory Research Appraisal tools and techniques such as direct observation, household survey, individual interviews and field visits. The research was carried out at Annapurna Gaupalika ward no. 4 (formerly known Bhadaure Tamagi VDC ward no. 1 and 2). It is in the West of Pokhara city (Headquarter of Western Development region of country Nepal or Province number 4) at about 30 km and is connecting with rural gravel road with regular access to public transportation and GPS location is Latitude 28º14'4818"–28º14'4827", Longitude 83º51'3125"–83º51'3128" and altitude 1405–1959 masl (Fig. 1). There are *ca*. 243 households in these two wards (193 in Badaure village and 50 in Talibrang).

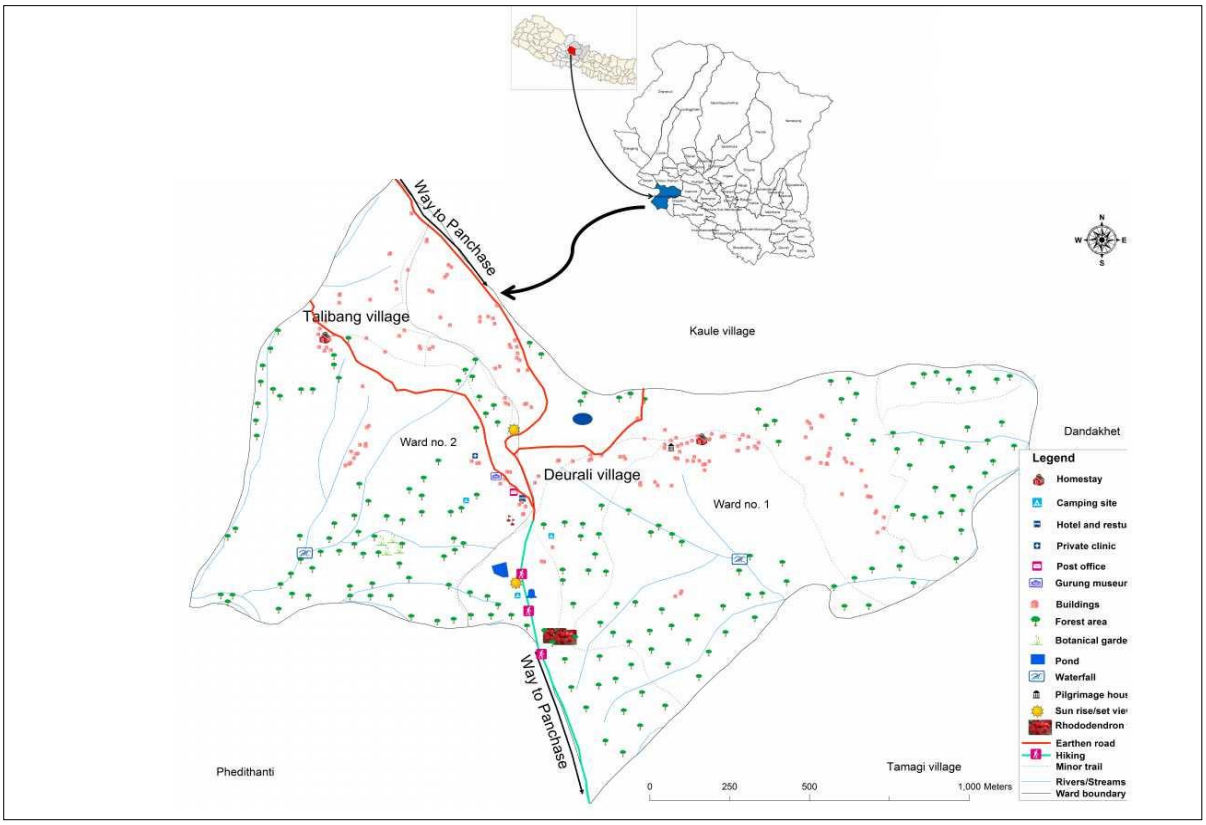

Figure 1. Map of the research area: Bhadaure Tamagi Village.

Fifteen randomly selected individuals were interviewed using semi-structural questionnaire. In addition, a checklist was prepared using focus group and key informant interviews. Through discussion, some key information was recorded on each of the species identified. These are: local vernacular names, type of plant, part used and period of availability of the part used. Each species was evaluated for nine different parameters (extent of production, the extent of consumption, the degree of consumption, perceived nutritional value, cultural importance, medicinal properties, market use, market value and contribution to household income). Then it was followed by the field visit with the help of community members. Informants (local Farmers) were asked to list the plants they considered as underutilized based on their potential and actual utilization including marketing opportunities. Scientific names were determined using the standard book of Flora namely Flowers of the Himalayas (Polunin & Stainton 1984), Flowers of the Himalaya (Stainton 1988), Dictionary of Nepalese Plant Names (Shrestha 1998) and with consulting local healer. Surfing the internet for latest findings and the search for the publications housed on the library (across national research and development institutions) were also conducted for better documentation of the NUS recorded.

RESULT AND DISCUSSION

From the community interaction and field visit, a list of 66 numbers of plants was extracted as underutilized plants in the field survey (Table 1). Plants belonging to herb were 22 plants, shrub 18 plants and trees 14 plants. Climbers (13 plants) were also recorded from the present study. Collections of these plants were made from garden (7 plants), cultivated field (32 plants) and wild habitat (63 plants). Most plants were perennial (43

plants), followed by annual (20 plants) and biannual (2 plants).

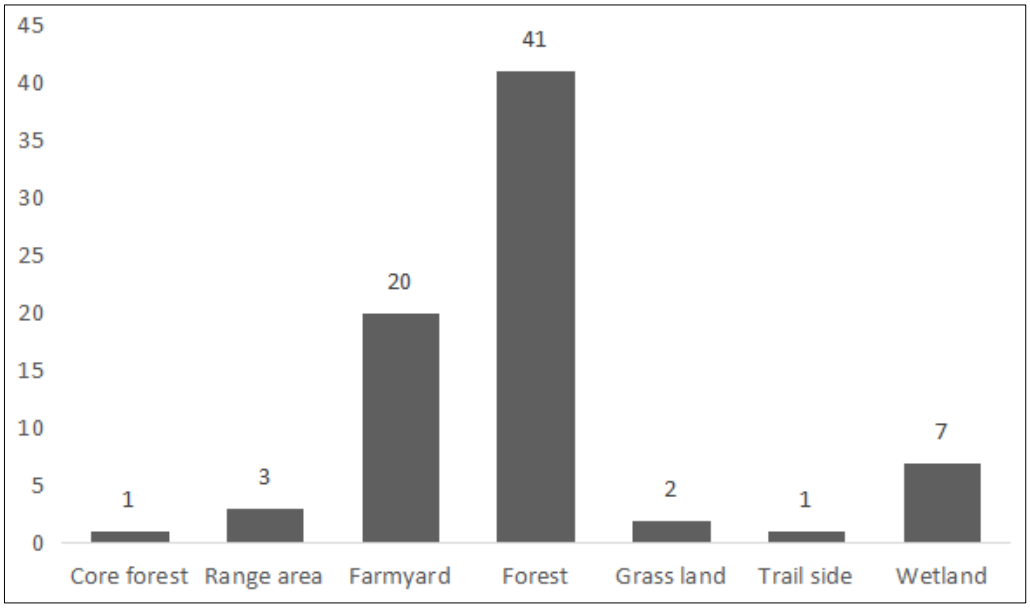

Figure 2. Habitat of the neglected and underutilized plant species.

Special consideration was done about the habitat of the plants, *i.e.*, wetland, farmyard, trail side, core forest, forest, grassland, agricultural land etc. (Fig. 2). About 55% of the species were collected from natural or semi-natural vegetation, particularly forest, whereas nearly out of 27% for total plants were found from farmyard area. Only 11 plants were found to be cultivated.

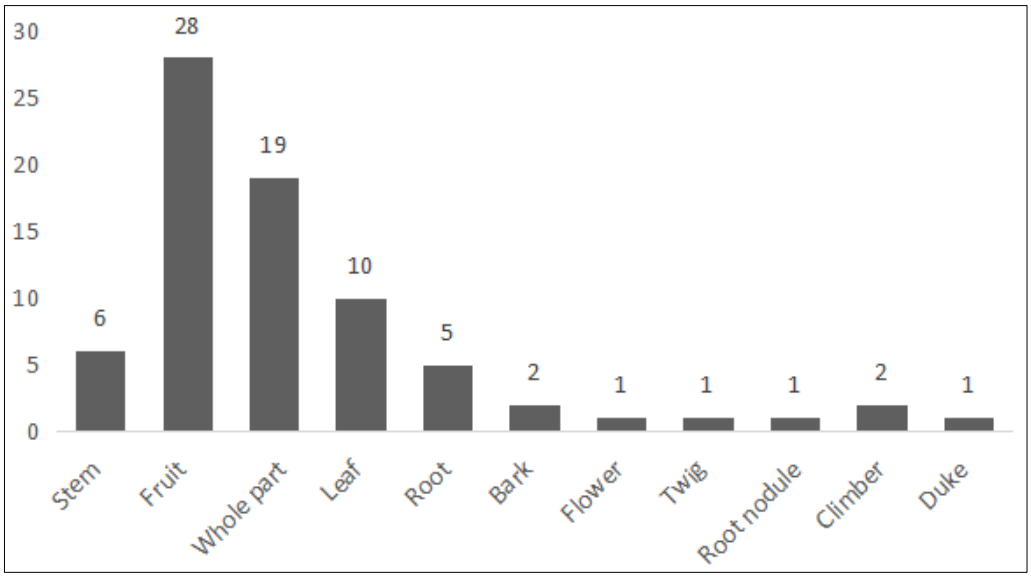

Figure 3. Diversity of plant parts used.

Out of a total of 66 traditional, neglected plants species, 10 species were mainly used for their leaves part, tender shoots or underground stem of 6 plant, flowers of 1 plant, fruits of 28 plant, roots and tubers of 6 plants, whole parts were of 19 plants and so on (Fig. 3). Similarly, 33% of the plants were used for vegetable, 25 plants for fruit or row food, 10 plants were for a medicinal purpose and so on (Fig. 4). Some plants like *Pyrus pashia* Buch.-Ham. ex D.Don, *Elaeagnus parvifolia* Wall. ex Royle, Rhamnaceae Plant, *Viburnum mullaha* Buch.-Ham. ex D. Don, *Pyrularia edulis* (Wall. ex Floxb.) A. DC., *Castanopsis indica* (Roxb. ex Lindl.) A.DC., *Zanthoxylum armatum* DC., *Dioscorea deltoidea* Wall. ex Griseb., *Dioscorea pentaphylla* L., *Choerospondias axillaris* (Roxb.) B.L. Brutt & A.W. Hill, *Artemisia absinthium* L. and others were collected for the fruit purposes and they are directly eaten as raw or used for medicinal purposes whereas plants like *Polygonum molle* D. Don, *Pouzolzia zeylanica* (L.) Benn., *Dendrocalamus hamiltonii* Nees & Am. ex Munro, *Colocasia* sp. and different types of *Niuro* and Mushroom are used as vegetable.

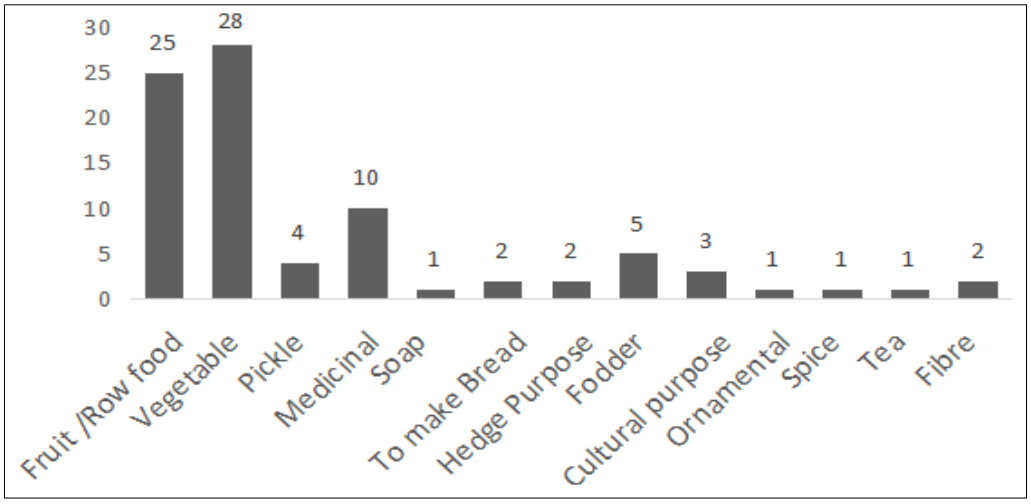

Figure 4. Different uses of the neglected and underutilized plants.

The collection or harvesting period of the recorded plant varied with species. Some of them (20 plants) can be collected every season, while months between June to August *i.e.* 12% was found to be the most appropriate period of harvesting (Fig. 5).

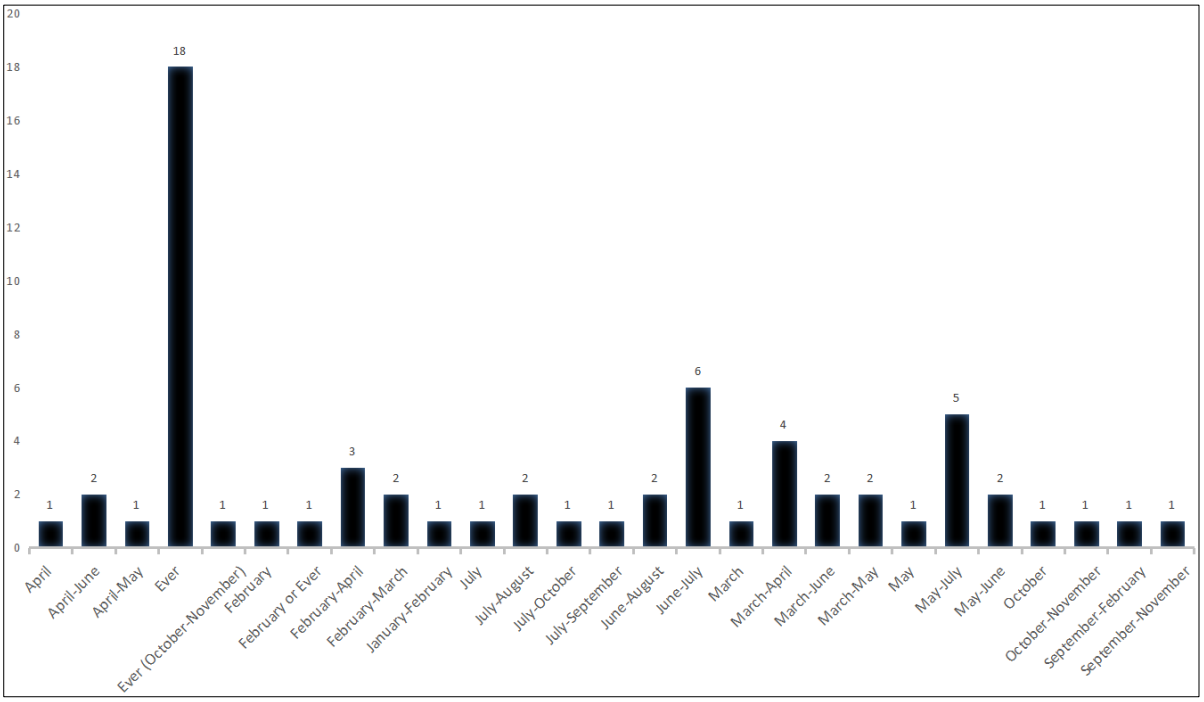

Figure 5. Collecting or harvesting season for neglected and underutilized plants.

According to the respondents, the availability of wild plants has also declined drastically, *e.g.*, because of land-use and habitat change, excessive collection from natural habitats, climate change causing more frequent droughts and fires, and deforestation. In the research area, species such as *Dioscorea bulbifera* L. and *Asparagus racemosus* Willd. were endangered because they have a high demand at markets, but are mostly (and often excessively) gathered from their natural habitats. Similarly, plants like *Viburnum mullaha*, *Catunaregam spinosa* (Thunb.) Tirveng., *Ziziphus sp.*, *Toddalia asiatica* (L.) Lam., *Dioscorea deltoidea*, *Citrullus colocynthis* (L.) Schrad., *Elaeagnus parvifolia*, *Coccinia grandis* (L.) Viogt, *Dioscorea pentaphylla*, *Agaricus campestris* L., *Oreocnide frutescens* (Thunb.) Miq., *Cyathea spinulosa* Wall. ex Hook., *Dioscorea bulbifera*, *Allium wallichii* Kunth, Baman, *Pyrularia edulis* or many wild species are declining day by day and turning towards rare condition due to their low regeneration power and the lack of proper awareness about the importance of the plants.

Out of the population of the farmers interviewed 40% were males and 60% were females. The average age of the respondents was about 38 years with the oldest being 78 years while the youngest being 25 years. The respondent information showed that the collection or harvesting of the plants was done by female mostly and

Table 1. Detail of the neglected and underutilized plant species, recorded in the research area.

SN	Local / Vernacular / Common names	Habit (Herb, Shrub, Tree)	Annual / Biannual / Perennial	Scientific Name	Family	Uses (Cereal, Pulses, Vegetable, fruit, medicine)	Part used	Period of availability
1.	Allo Sisnu	S	P	*Girardiana* sp.	Urticaceae	Fiber	Stem	Ever
2.	Amphi	T	P	*Pyrularia edulis* (Wall. ex Floxb.) A. DC.	Santalaceae	Fruit and soap	Fruit	Jul.–Oct.
3.	Angheri	S	P	*Melastoma melabathricum* L.	Melastomataceae	Fruit	Fruit	Apr.–May
4.	Ankhe Timur	S	P	*Zanthoxylum armatum* DC.	Rutaceae	Vegetable	Fruit	Jul.–Aug.
5.	Ausali	S	P	*Rubus ellipticus* Sm.	Rosaceae	Fruit	Fruit	Feb.–Apr.
6.	Baman	S	P	-	-	Pickle and medicine, Fodder of goat (Treat body ache)	Leaflets	Mar.–Apr.
7.	Ban Dhaniya	H	A	*Selinum* sp.	Apiaceae	Vegetable	Whole part	Ever
8.	Ban Lasun	H	A	*Allium wallichii* Kunth	Amaryllidaceae	Vegetable	Whole part	Ever
9.	Ban Tarul	C	P	*Dioscorea bulbifera* L.	Dioscoreaceae	Vegetable and medicine	Underground stem	Jan.–Feb.
10.	Barmale	H	A	Pouzolzia zeylanica (L.) Benn.	Urticacee	Vegetable	Whole part	Ever
11.	Berulo	T	P	*Ficus sarmentosa* Buch.-Ham. ex Sm.	Moraceae	Fruit and Fodder	Fruit and Leaf	Jun.–Jul.
12.	Bet Lauri	S	P	*Cheilocostus speciosus* (J.Koenig) C.D.Specht	Costaceae	Juice	Stem	Ever
13.	Bhai Aiselu	H	A	*Fragaria nubicola* (Lindl. ex Hook.f.) Lacaita	Rosaceae	Fruit	Fruit	Jun.–Jul.
14.	Bhutro	S	P	*Berberis* sp.	Berberidaceae	Fruit	Fruit	Feb.–Apr.
15.	Chari khutte niuro	H	A	-		Vegetable	Whole part	May–Jul.
16.	Chhatre	S	P	*Cyathea spinulosa* Wall. ex Hook.	Cyatheaceae	Vegetable	Young leaf	May–Jun.
17.	Chiple	C	P	*Oreocnide frutescens* (Thunb.) Miq.	Urticaceae	to make Nepalese bread (Like ring)	Root	Ever
18.	Chiple niuro	H	A	-		Vegetable	Whole part	Apr.–Jun.
19.	Chutro	S	P	*Berberis asiatica* Roxb. ex DC.	Berberidaceae	Fruit, medicine and hedge	Fruit	Mar.–Apr.
20.	Dalchini	T	P	*Cinnamomum verum* J.Presl	Lauraceae	Spices and tea	Bark and leaf	Ever
21.	Damoura	S	P	*Artemisia absinthium* L.	Asteraceae	Fruit	Fruit	Sept.–Nov.
22.	Dro (Chhatre) Chyau/ Mushroom	H	A	*Agaricus campestris* L.	Agaricaceae	Vegetable	Whole part	Jun.–Jul.
23.	Ghodtapre	H	A	*Centella asiatica* (L.) Urb.	Apiaceae	Medicine and pickle	Whole part	Ever
24.	Githa	C	P	*Dioscorea pentaphylla* L.	Dioscoreaceae	Vegetable and medicine	Fruit	May–Jul.
25.	Golkakro	C	P	*Coccinia grandis* (L.) Voigt	Cucurbitaceae	Fruit	Fruit	Apr.–Jun.

SN	Local / Vernacular / Common names	Habit (Herb, Shrub, Tree)	Annual / Biannual / Perennial	Scientific Name	Family	Uses (Cereal, Pulses, Vegetable, fruit, medicine)	Part used	Period of availability
26.	Guyali	S	P	*Elaeagnus parvifolia* Wall. ex Royle	Elaeagnaceae	Fruit	Fruit	Apr.
27.	Halhale	H	A	*Rumex nepalensis* Spreng.	Polygonaceae	Vegetable	Whole part	Ever
28.	Indreni	C	P	*Citrullus colocynthis* (L.) Schrad.	Cucurbitaceae	Fruit and Medicine	Fry fruit	Jun.–Jul.
29.	Jaluko	H	A	*Colocasia* sp.	Araceae	Vegetable	Whole part	Ever
30.	Jamune mandro	S	P	*Mahonia nepalensis* DC.	Berberidaceae	Fruit	Fruit	Mar.
31.	Jhari chyau/ Mushroom	H	A	-	-	Vegetable	Whole part	Jun.–Jul.
32.	JogiMula	C, H	B	-	-	Row food	Root	Ever (Oct.–Nov.)
33.	Kafal	T	P	*Myrica esculenta* Buch.-Ham. ex D. Don	Myricaceae	Fruit	Fruit	Feb.–Apr.
34.	Kali niuro	H	A	*Tectaria macrodonta* (Fee) C Chr	Tectariaceae	Vegetable	Young leaf	May–Jul.
35.	Kasitifu chyau / Mushroom	H	A	-	-	Vegetable	Whole part	May–Jun.
36.	Katus	T	P	*Castanopsis indica* (Roxb. ex Lindl.) A.DC.	Fagaceae	Fruit, Fodder and timber	Fruit	Oct.–Nov.
37.	Kaulo	T	P	*Persea odoratissima* (Nees) Kosterm.	Lauraceae	To make Nepalese Bread (Like Ring)	Bark	Ever
38.	Kavro	T	P	*Ficus lacor* Buch.-Ham.	Moraceae	Pickle	Flower	Jul.–Aug.
39.	Khole sag	H	A	*Nasturtium officinale* R.Br.	Brassicaceae	Vegetable	Whole part	Ever
40.	Kukurdaino	C	P	*Smilax ovalifolia* Roxb. ex D.Don	Smilacaceae	Fruit and cultural (To make statue in human dead)	Fruit	Feb.–Mar.
41.	Kurilo	C	P	*Asparagus racemosus* Willd.	Asparagaceae	Vegetable and medicine	Young twig and root	Mar.–Jun.
42.	Kyu Kafal	S	P	*Morus australis* Poir.	Moraceae	Fruit	Fruit	Mar.–Jun.
43.	Lakhuto niuro	H	A	-		Vegetable	Whole part	May
44.	Laligurans	T	P	*Rhododendron arboreum* Smith	Ericaceae	Ornament, Medicine	Fruit	Mar.–Apr.
45.	Lapsi	T	P	*Choerospondias axillaris* (Roxb.) B.L. Brutt & A.W. Hill	Anacardiaceae	Fruit	Fruit	Feb.
46.	Makar Kanje	H	A	*Begonia picta* Smith	Begoniaceae	Cultural	Whole part	Ever
47.	Malkacha (Gaoufla)	C	P	*Catunaregam spinosa* (Thunb.) Tirveng.	Rubiaceae	To make rope	Climber whole part	Jul.–Sept.
48.	Malo	S	P	*Viburnum mullaha* Buch.-Ham. ex D. Don	Adoxaceae	Fruit	Fruit	Feb.–Mar.
49.	Mel	T	P	*Pyrus pashia* Buch.-Ham. ex D.Don	Rosaceae	Fruit	Fruit	Oct.
50.	Nigalo	S	P	*Drepanostachyum intermedium* (Munro) Keng f.	Poaceae	Fibre	Stem	Ever

SN	Local / Vernacular / Common names	Habit (Herb, Shrub, Tree)	Annual / Biannual / Perennial	Scientific Name	Family	Uses (Cereal, Pulses, Vegetable, fruit, medicine)	Part used	Period of availability
51.	Padina	H	A	*Mentha spicata* L.	Lamiaceae	Vegetable	Whole part and leaf	Ever
52.	Paiyu	T	P	*Prunus cerasoides* Buch.-Ham. ex D.Don	Rosaceae	Fruit, fodder and cultural	Fruit, leaf	Feb. or Ever
53.	Pani Amala	H	H	*Nephrolepis cordifolia* (L) Presi.	Nephrolepidaceae	Fruit and fodder	Root nodule and leaf	Ever
54.	Plane chyau/ Mushroom	H	A	-	-	Vegetable	Whole part	Jun.–Aug.
55.	Sil Timur	T	P	*Lindera neesiana* (Wall. ex Nees) Kurz	Lauraceae	Vegetable	Fruit	Sept.–Feb.
56.	Sisnu	S	P	*Urtica dioca* L.	Urticaceae	Vegetable and hedge	Leaf	Ever
57.	Sutpi (Patemlo)	C	P	*Ziziphus* sp.	Rhamnaceae	Fruit and rope	Fruit and climber	Mar.–May
58.	Syanifal	C with thorn	P	*Toddalia asiatica* (L.) Lam.	Rutaceae	Fruit	Fruit	Mar.–Apr.
59.	Tama	T	P	*Dendrocalamus hamiltonii* Nees & Am. ex Munro	Poaceae	Vegetable	Young stem	May–Jul.
60.	Thakailo	S	B	*Cirsium verutum* (D.Don) Spreng.	Asteraceae	Row food	Root and Duke	Mar.–May
61.	Thotne	C, S	P	*Polygonum molle* D. Don	Polygonaceae	Vegetable	Young leaf	Ever
62.	Tusa (ghude)	S	P	*Drepanostachyum falcatum* (Nees) Keng f.	Poaceae	Vegetable	young stem	May–Jul.
63.	Vakimlo	T	P	*Brucea javanica* (L.) Merr.	Simaroubaceae	Pickle and Medicine (Stomach ache)	Fruit	Mar.
64.	Vyakur	C	P	*Dioscorea deltoidea* Wall. ex Griseb.	Dioscoreaceae	Vegetable and medicine	Fruit	Jul.
Mushrooms								
65.	Mude chyau/ Mushroom	H	A	-	-	Vegetable	Whole part	Jun.–Jul.
66.	Bagale Chyau/ Mushroom	H	A	*Mycena galericulata* (Scop. ex. Fr) Gray	Mycenaceae	Vegetable	Whole part	Jun.–Aug.

Note: H, Herb; S, Shrub; T, Tree; C, Climber; A, Annual; B, Biannual; P, Perennial.

that was especially for their domestic purposes. In one Nepalese site, women above 35 years of age could describe the uses of 65 percent of all edible species, while young men could only describe 23 percent (Shrestha & Dhillon 2006). Beside this, the male respondent of the study area was comparatively more familiar towards such plant than female. Owing to the advancement of the technology young generation seem not to be interested in utilizing these plants.

Despite their importance for subsistence, income generation, and culture, the use of the plant is declining at an alarming rate in the study area. This occurs particularly in easily accessible regions, where commercialization of the production is easily possible. Only few plants such as *Zanthoxylum armatum*, *Ficus sarmentosa* Buch.-Ham. ex Sm., *Cinnamomum verum* J.Presl, *Persea odoratissima* (Nees) Kosterm., *Ficus lacor* Buch.-Ham., *Asparagus racemosus* and *Choerospondias axillaris* were still cultivated at field-scale in the field surveyed (Table 1) due to their known economic values. Cultivation of exotic plants for subsistence and sale increases more and more at the expense of traditional ones, partly promoted by development programs. These studies mostly did not consider the disadvantages of exotic plants, *e.g.*, the high need of external inputs for successful cultivation or the often rather low nutritional value.

The specific niches where they were growing included the inside core forest (Community as well as National), trail side, along with the fences or farm boundaries while others were mainly growing in streamside and uncultivated areas. However, these plants received minimum or no agronomic attention and most often get waste at the time of peak production.

Some of these plants were observed on market places being sold at competitive prices. Specific household members consume these plants. Some market data was recorded *e.g.*, powder of Rhamnaceae Plant (Sutpi) plant's fruit was sold US$1.5/Kg by a house. From Brahmin community selling of NIURO/Circinate fern occasionally is practiced. There was no trend of good agricultural practices; they did that only in season for paddy and millet, not for vegetable and fruit. So, their collection from wild habitat was for themselves only. Further, the people of the study area have followed Gurung culture and per them, selling of growing plants to generate money are against their religion. “Social prestige is often worth more than money in the Gurung societies”. So, there is the absence of marketing trend. They collect the plant product for their own utilization or use as gift items to visit their relatives. In a perfectly competitive market, no species would be considered “underutilized:” its use would reflect its low value, and limitation of its collection or cultivation to specific areas would be justified. As argued above, plant species are underutilized because of market imperfections. These days by the commercialization and easy accessibility of market as well as other facilities, the community began to realize the importance of money by selling their product.

The lack of economic information and the lack of product knowledge can negatively contribute to the failure in the market. The lack of knowledge can be a market constraint, resulting in a lower demand than what it would be under full information. Although the study is not carried out sound economic analysis but data clearly shows that the neglected species are an important source of household incomes and can contribute to poverty reduction. Such species can be introduced to the study area by marketing development. The market can be developed by increasing market demand through the promotion of their value with better scientific knowledge. These plants can be conserved and utilized in home stay which is flourishing from the study area.

Lack of attention of NUS by stakeholders in the industry meant that their potential value is under-estimated and under-exploited. It also places them in danger of continued genetic erosion and disappearance which would further restrict development options for the poor. To avoid or at least minimize the impending genetic and cultural erosion concerning traditional and neglected plants, their germplasm should intensively be collected and conserved on-farm as well as in gene banks. The related indigenous understanding urgently needs to be documented for serving future generations. The cultivation methods of these plants should be studied and improved. Their nutritional value needs to be analyzed and recognized. In addition, their utilization should be promoted to improve livelihoods. Encouraging farmers to continue growing these traditional crops is also a challenge. Recognizing the role played by farmers as custodians of local diversity is an influential way to reinforce the self-esteem of community members and thus to contribute towards a self-sustainable and righteous circle for on-farm conservation.

Some strategies aiming at conserving these plant species focus on the promotion of their use and conservation including the strengthening of the market system. The starting point is, therefore, collection and synthesis of knowledge of the obtainable situation within the authorization region through a survey. The survey therefore aimed at i) identifying underutilized fruit species ii) identify the gaps in the product value chain where

there was underutilization and iii) identify the major cultivation constraints. To provide policy makers with more detailed, robust and convincing economic data, it is recommended that a scientifically well-designed socio-economic study be conducted on the identified species.

CONCLUSION

Owing to no prior documentation of the plants from the studied area, this research focused in the enumeration of plants may help in developing a conceptual framework whereby so called useless plants could be employed for the benefit of the mankind. This study revealed that these plants endow several beneficial aspects and could be highly beneficial if these resources could be tapped properly. Also, creating the awareness about the utilization of the beneficial aspects of these plants may help uplift the socio-economic condition of the local inhabitants. In addition, alternative beneficial aspects and the rigorous scientific discourse could also be carried out utilizing these plants.

ACKNOWLEDGEMENT

I am highly acknowledgment the PEACE Programme of USC Canada/MDO and its employees for their contribution in field study. The gratitude is extending towards my friend Bikash Baral, Ph.D. scholar for his incessant encouragement to carry out this research. I cannot remain quite without giving sincere thanks to the villager of the study area, especially Prem Gurung, Sri Prasad Gurung and Hiralal Gurung.

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