RESEARCH ARTICLE

Traditional Use of wild plants for food in West Sikkim, India

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ABSTRACT

Study of Wild plants which are used for medicine, food and tools is known as the study of ethnobotany (how people utilised plants). Present study is carried out in West Sikkim firstly because of it richness in ethnic and floral diversity and secondly due to the location of Kanchendzonga National Park which is a world heritage site. The study was conducted between August 2015– October 2017 to understand, explore and assess the present status of local ethno-edible plants. The prime objective of the present research work includes documentation of the ethnobatanical diversity, their distribution and the pattern of their utilisation and conservation of Wild Edible plants resources in the west Sikkim including Kanchenjunga Biosphere reserve The present research work is based on a survey conducted on Wild Edible Plants. The data which were collected through structured questionnaire and interview of 90 respondent (Both Men and Women). Then the survey was followed by a process of sample collection from entire west Sikkim which includes all the protected areas. It was then followed by a standard literature for their correct identification. The herbarium is deposited in botanical Survey of India, Gangtok, Sikkim. In the present study 124 plants species, 100 genera of 61 families had been recorded out of which there are 44 herbs, 10 Shrubs, 54 trees and 16 Climbers which are used by local people as food . It was observed that the availability of these plants is decreasing at an alarming rate. This observation also reveals that habitat destruction, over exploitation and unplanned agriculture were the reason for depletion of edible plants. Therefore, the edible plants, used as food by local people need urgent conservation.

Keywords: Ethno-botany , Wild Edible plants , West Sikkim

INTRODUCTION

Millions of peoples in developing countries on this planet have to face various kind of scarcity and problems in the survival of their life, food scarcity is one of the biggest challenge faced by the poor and tribal peoples in these countries. Millions of peoples do not have enough food to meet their everyday requirements and a bigger number of peoples are deficient in one or more micronutrients (Annual Report Rome, 2004).

Despite the primary reliance of agricultural societies on domesticated plants and animals for food, the tradition of consuming wild plants has not been completely erased. Millions of people, particularly tribal and rural communities in many developing countries still collect and consumed a wide variety of wild plant resources to meet their food requirements. Wild sources of food, in general, remain particularly important for the poor and landless, and are especially important during times of famine or conflict when normal food supply mechanisms are disrupted and local or displaced populations have limited access to other kinds of food. The role of these edible plant species in maintaining human and environmental health has been reported. Intensive studies concerning its nutritional role have also been highlighted in many surveys around the world. Moreover, these plants have played an important role in complementing staple foods to provide a balanced diet by supplying of protein, fat, sugars, trace elements, vitamins, and minerals. This topic is relevant at the moment, as biodiversity conservation and its links with nutrition and human health is the subject of a recent cross-cutting initiative by the Convention on Biological Diversity (CBD 2005) . Presently, a considerable proportion of rural population, particularly in remote areas of India do not produce enough food grains to meet yearly food requirement. Therefore, a large share of rural population is meeting their nutritional requirement through unconventional means, by consuming various wild plants (Singh *et al*., 1978). Although only three crops -wheat, maize and rice provide around 50% of human energy intake (Jaenicke *et al*., 2006); some 7000 species are used, or have been used, for human food (Grivett *et al*., 200).

Traditional knowledge on the edible plants has been developed and used in virtually all cultures around the globe and India is no exception to it. The traditional knowledge and consumption of wild edible plants of Indian ethnic communities is rich and unique in the world. Sikkim, one of the North eastern states of India has oldest and richest cultural traditions of using plants for various ethnobotanical purposes. Its diverse topography has permitted the survival of traditional knowledge related to plant resources used by locals as food. Even though, the consumption of plants gathered from the wild represented an important part of human nutrition in Sikkim. The rapidity with which environmental damage, loss of floristic and cultural diversity occurs today, a necessity is felt for the recording and documentation of traditional knowledge about the uses of edible plants - knowledge which is widely disappearing. Therefore, there is an urgent necessity to document traditional knowledge, focusing on the maintenance of this important cultural practice. It seems therefore imperative to investigate the current available knowledge on wild edible plants traditionally used in West Sikkim District of Sikkim. The study can provide a baseline data on the value of such locally produced food source particularly at times of food shortage which may be helpful for prioritization of conservation through sustainable use and management of the resources

Choice of Present Study:

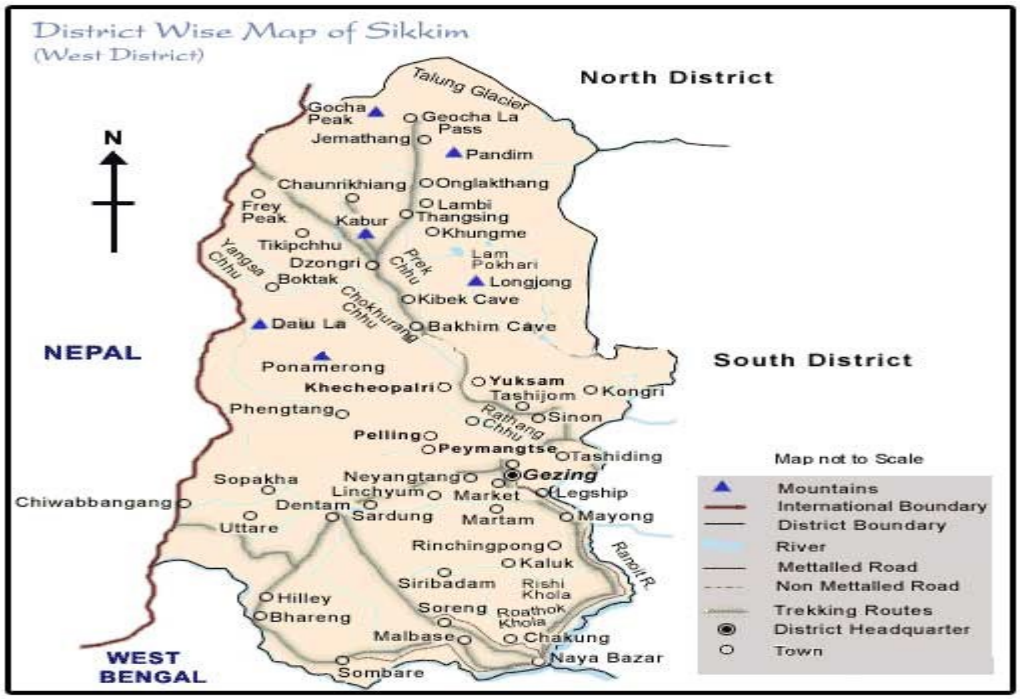
Sikkim is biodiversity hotspot with rich wealth of valuable plants and ethnic cultures. Due to variation in topography and climate it is rich in floral diversity but despite of this, the ethonobotanical studies is yet not complete from low land to high land as well as these precious knowledge is getting lost because of rapid modernization. Based on the above literatures it is revealed that no attempt has been made so far to conduct detailed ethnobotanical studies on various ethnic communities living in West Sikkim though significantly rich in ethnobotanical diversity. Thus, it offers an immense scope for such ethnobotanical studies in West Sikkim including the Kanchenjunga Biosphere Reserve.

Description of the Study Area

West Sikkim is a district of Sikkim that is glittering jewel in the crown of the enigmatic beauty of Sikkim . Its capital is Gayzing, also known as Gyalshing.

West Sikkim was the capital of the state Yuksom in the north of western Sikkim. Its serves as the capital from 1642 for almost 50 years until it was shifted to Rebtense. The district was under the occupation of Nepalese for 30 years in the 18th and 19th Century. After Anglo-Nepalese war (1814-1816), the district was returned to Sikkim. West Sikkim not only holds the ancient heart and soul of Sikkim, it is where the travellers are more likely to discover Sikkim in its ancient form.

West Sikkim is located in south western corner of the state . Its shares boundary with north district of Sikkim in north , Darjeeling district of West Bengal in the south , Nepal in the West and South district of Sikkim in the east . West Sikkim is second largest



district of the Sikkim with an area of 1166 sq km , it is located between 27^0 -27^0 55 ″ North latitude and 88^0 - $88^0$36 ” East latitude . According to census 2011 , total population of West Sikkim is 136435 out of which 70,238 are males and 66,197 are females.

Kanchenjunga Biosphere also known as Kanchenjunga National park is located in West and North district of Sikkim . Spreads across an areas of 1784 sq km , the as Kanchenjunga National park is largest wide life reserve of Sikkim the third largest peak in the world the Kanchenjunga which is 8586 meter tall straddles the western boundary of the park from which the reserve gets its name . The national park is endowed with on of the most magnificent eco-system in the world. It was established in the year 1977. Kanchenjunga National Park has been inscribed as India’s first “Mixed Heritage” site on UNESCO World Heritage list on July 17th, 2016. It is one of the few high altitude National parks of India. The vegetation of the park includes temperate broadleaf and mixed forests consisting of oaks, fir, birch, maple, willow, etc. The vegetation of the park also includes alpine grasses and shrubs at higher altitudes along with many medicinal plants and herbs.

Objective of Present Study:

The prime objective of the present research work includes documentation of the ethnobatanical diversity of Wild Edible Plants, their distribution and the pattern of their utilisation and conservation of Edible Plants resources in the west Sikkim including Kanchenjunga Biosphere reserve.

MATERIAL AND METHODS:

Before starting the field work, general information about study area was collected from the local people. A preliminary survey was done along with a local person. About 70 different sites were visited and indigenous Wild Edible plants that are being used in that area were collected, these plants were then fetched and showed to the local old people, in order for them to note the medicinal uses of the collected plants. About 99 local informants were interviewed. Questionnaire form was compiled in an ordered form. Questionnaires are divided into three parts part –A, part – B and part – C.

The present investigation is divided into two parts:

Part A. Interview with local people, collection, identification of medicinal plants:

First step was the interview done with local people. In the interview they were asked about the usage of these plants in their daily life. The plants, that have been used in research are edibles. Collections were made throughout the year by visiting different spot of West

Sikkim, and special care was taken not to miss the flowering stages or the fruits. In every case, multiple sets of collections were made. In the course of collection, endeavour was made to know local names of the plants.

Part B. Study of Ethnobotanical aspects:

For the present investigation, local people were interviewed in the study area about different aspect that is

(a) Age of the person
(b) Source of Income
(c) Their Occupation
(d) List of Plants used by them
(e) Propose of use
(f) Parts of plants used
(g) Method of use
(h) From where they get the plants and
(i) Abundance of the plants

Part C. Scientific aspects of medicinal plants:

In the final step, after collecting the Edible plants used by the local people the researcher took the specimen to the Botanical Survey of India, Gangtok, Sikkim. Then investigator identified the particular plants from the herbarium reserved with BSI, Sikkim and noted down the nomenclature.

RESULTS AND DISCUSSION

The flora of the study area is rich and provies diverse useful speces. The study documented 124 Wild Edible plants Species classified amoung 100 genera and 61 family. The result of the study reavled that Moraceae (12 families), Fagaceae (5 families) and Dioscoreaceae (5 families) have the highest propoertion the edibles . The growth form of the species includes herbs, Shrubs, Trees and Climbers. Trees (54) and Herbs 44 make up the highest proportion of the edible species. Fruits, Seeds, Young Shoots, Leaves,Tubers, Shoots and Flower are the parts used widely by the local people in the study areas.

A brief Description about the edible parts of Wild Edible Plants

1. Fruit :

According to the present study, **fruit** is that part of Wild Edible plants which constitute the highest proportion of Edibles. The study reveals that out of 100 % of edible parts of Wild Edible plants **fruits** is almost 38 %. Name of few such plants are as follows

1. *Actindia callosa* Lindl.
2. *Aegle marmelos* (L.) Correa
3. *Alangium salviolium* (L. F.) Wangerin
4. *Anthocephalus chinensis* (Lam.) A. Rich.ex Walp.
5. *Artocarpus lakoocha* Wall.ex Roxb.
6. *Choeropondias axillaris* (Roxb.) B. L. Burtt and A. W. Hill
7. *Ficus auriculata* Lour.
8. *Elaeagnus infundibularis* Momiy.
9. *Ficus auriculata* Lour.
10. *Ficus clavata* Wall. Ex Miq.

2. Seeds

According to the present study, **Seeds** is that part of Wild Edible plants which constitute the 2nd highest proportion of Edibles . The study reveals that out of 100 % of edible parts of Wild Edible plants **Seeds** is almost 14 % . Name of few such plants are as follows

1. *Caryota urens* L.
2. *Castanopsis hystrix* Miq.
3. *Castanopsis indica* (Roxb.) Miq.
4. *Castanopsis tribuloides* (Sm.) A. DC.
5. *Entada scandens* (L.) Benth
6. *Fagopyrum dibotrys* (D. Don) H. Hara
7. *Guizotia abyssinica* (L.f.) Cass
8. *Hedgsonia heteroclita* Hook.f. and Thomson

3. Young Shoot :

According to the present study, **Young Shoot** is that part of Wild Edible plants which constitute the 3rd highest proportion of Edibles. The study reveals that out of 100 % of edible parts of Wild Edible plants **Young Shoot** is almost 13% . Name of few such plants are as follows

1. *Arundinaria maling* Gamble
2. *Bambusa tulda* Roxb.
3. *Arundinaria intermedia* Munro
4. *Girardinia diversifolia* (Link) Friis

4. Leaves :

According to the present study, **Leaves** is that part of Wild Edible plants which constitute the 4th highest proportion of Edibles. The study reveals that out of 100 % of edible parts of Wild Edible plants **Leaves** is almost 9 %. Name of few such plants are as follows

1. *Eclipta prostrata* (L.) L.
2. *Mentha arvensis* L.
3. *Nasturtium officinale* W. T. Aiton
4. *Eryngium foetidum* L.

5. *Eclipta prostrata* (L.) L.
6. *Alternanthera sessile* (L.) DC.
7. *Amaranthus lividus* L.
8. *Amaranthus spinosus* L.

5. Tubers :

According to the present study, **Tubers** is that part of Wild Edible plants which constitute the 5th highest proportion of Edibles. The study reveals that out of 100 % of edible parts of Wild Edible plants **Tubers** is almost 7 %. Name of few such plants are as follows

1. *Dioscorea alata* L.
2. *Dioscorea bulbifera* L
3. *Dioscorea deltoidea* Wall.ex Griseb.
4. *Dioscorea hamiltonii* Hook.f.
5. *Dioscorea pentaphylla* L.

6. Flower :

According to the present study, **Flower** is that part of Wild Edible plants which constitute the 6th highest proportion of Edibles . The study reveals that out of 100 % of edible parts of Wild Edible plants **Flower** is almost 4% . Name of few such plants are as follows

1. *Rhododendron arboreum* Smith
2. *Piper mullesua* Buch.-Ham.ex D. Don
3. *Oroxylum indicum* (L.) Benth. Ex Kurz

7. Shoots :

According to the present study, **Shoots** is that part of Wild Edible plants which constitute the 7th highest proportion of Edibles. The study reveals that out of 100 % of edible parts of Wild Edible plants **Shoots** is almost 3.5 % . Name of few such plants are as follows

1. *Houttuynia cordata* Thunb.
2. *Lepidium sativum* L.
3. *Houttuynia cordata* Thunb.

8. Bulb and Leaves:

According to the present study, **Bulb and Leaves** is that part of Wild Edible plants which is widely used by the local people. The study reveals that out of 100 % of edible parts of Wild Edible plants **Bulb and Leaves** is almost 2.5 %. Name of few such plants are as follows

1. *Allium wallichii* Kunth.

2. Nuts :

According to the present study, **Nuts** is that part of Wild Edible plants which is widely used by the local people. The study reveals that out of 100 % of edible parts of Wild Edible plants **Nuts** is almost 2.5 % .

3. Bark :

According to the present study, **Bark** is that part of Wild Edible plants which is widely used by the local people. The study reveals that out of 100 % of edible parts of Wild Edible plants **Bark** is almost 2 % .

4. Leaf Buds :

According to the present study, **Leaf Buds** is that part of Wild Edible plants which is widely used by the local people. The study reveals that out of 100 % of edible parts of Wild Edible plants **Leaf Buds** is almost 2 % .

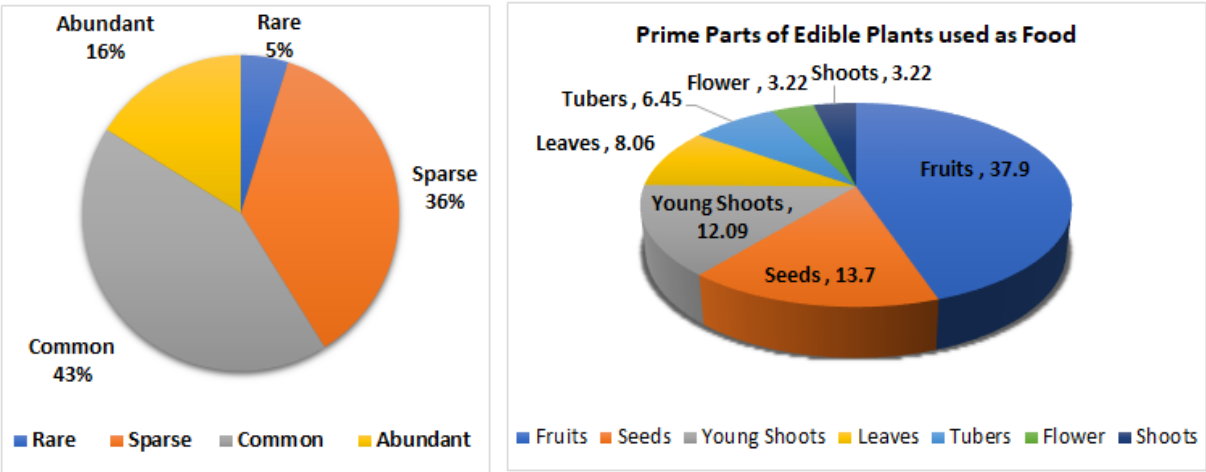


Fig.1: Pie-Charts Showing Number of Plants of different Categories on Habit Basis

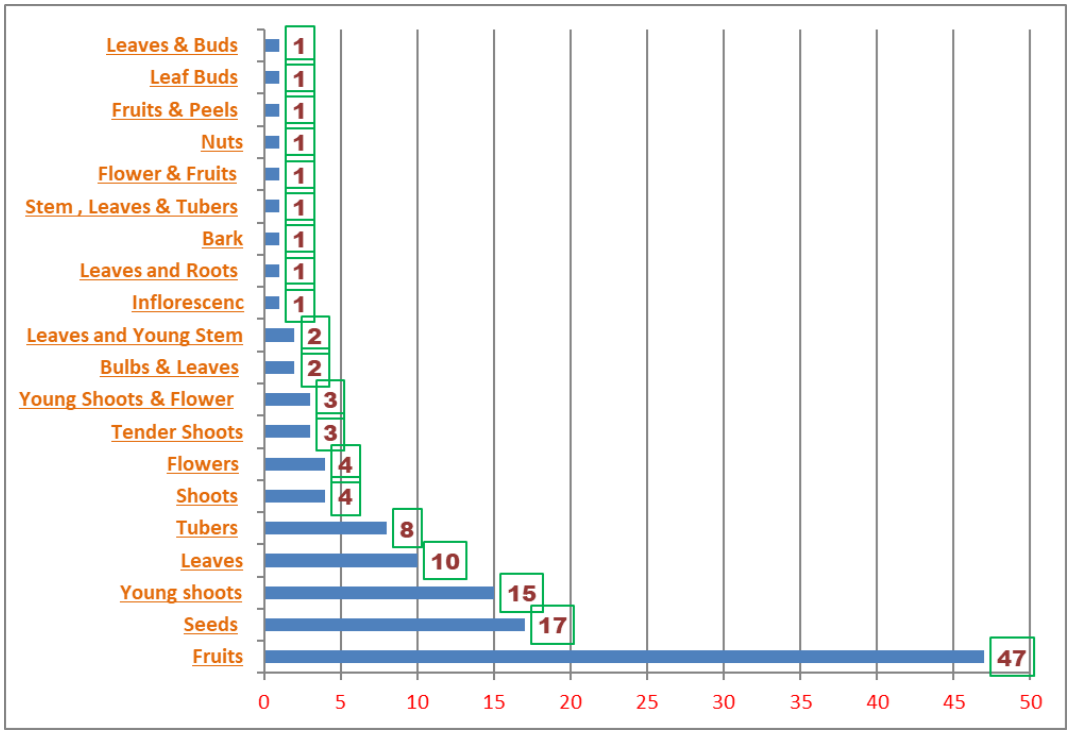


Fig.2: showing different parts of Plants used as food in Numbers

(A) (B) (C) (D)

Fig. 3: (A) *Laporta terminalis* Wight (B) *Hedgsonia heteroclita* Hook .f . and Thompson (C) *Tectaria coadunata* (J. Sm.) C. Chr. (D) *Solena amplexicanlis* (Lam.) Gandhi

Table 1: Diversity and utilisation pattern of wild edible plants in West Sikkim, India

Botanical Name	Local Name	Family	Distributional Range	Pattern of Use	Parts Used	Status	Habit
Actindia callosa Lindl.	Theki Phal	Actinidiaceae	4-26m	Fruits	Fruits	Sp	C
Aegle marmelos (L.) Correa	Bael	Rubiaceae	500-1100m	Fruit pulp is eaten	Fruit	Sp	T
Agapetes serpens (Wight)	Khorsane	Ericaceae	1400-2700 m	Raw fruits and flowers eaten	Flowers and fruits edible	Sp	S
Alangium salviolium (L. F.) Wangerin	Asare	Alanginaceae	145-400	Ripe fruit is eaten	Fruit	Co	T
Allium wallichii Kunth.	Ban lasun	Amyrallidaceae	2800-4300m	Seasoning spices	Bulbs and leaves	Sp	H
Alternanthera sessile (L.) DC.	Saranchi saag	Amaranthaceae	150-1800m	Vegetable	Leaves	Sp	H

Amaranthus lividus L.	Latte saag	Amaranthaceae	700-1900m	Vegetable	Leaves	Co	H
Amaranthus spinosus L.	Lude saag	Amaranthaceae	1000- 2200m	Vegetable	Leaves	Co	H
Amaranthus viridus L.	Lude saag	Amaranthaceae	900-2400m	Vegetable	Leaves	Co	H
Anthocephalus chinensis (Lam.) A. Rich.ex Walp.	Kadam	Rubiaceae	290-800m	ripe fruits is edible, roasted and oil consumed	Fruits	Sp	T
Arisaema tortuosum (Wall.) Schott	Toa	Araceae	1700- 3000m	Stems and leaves are dried and eaten as vegetable, tuber is fermented to prepare alcoholic beverages	Stems, leaves and tubers	Co	H
Artocarpus lakoocha Wall.ex Roxb.	Badar	Moraceae	100-1000m	Ripe fruit is eaten raw and raw fruits is eaten as vegetable	Fruits	Co	T
Arundinaria intermedia Munro	Malingo	Poaceae	2000-3000m	Vegetable	Young shoots	Co	H
Arundinaria maling Gamble	Malingo	Poaceae	1500-3500m	Vegetable	Young shoots	Co	H
Asparagus racemosus Willd.	Kurilo	Liliaceae	300-2200m	Eaten as vegetable	Shoots	Sp	H
Bambusa tulda Roxb.	Katta bans	Poaceae	800- 1600m	vegetable, fermented in making pickles	Young shoots	Sp	H
Bauhinia purpurea L.	Tanki	Fabaceae	300-1600m	Vegetable	Leaves and roots	Co	T
Bauhinia variegata L.	Koirala	Fabaceae	150-1900m	Vegetable	Flower	Co	T
Begonia picta Sm.	Magarkanch	Begoniaceae	500-3000m	Preparation of pickles and jams	Shoots	Co	H
Boehmeria rugulosa Wedd.	Daar	Urticaceae	300-1700m	Powder is mixed with flour to make chapati	Bark	Co	S
Boehmeria ternifolia D. Don	Chalnu sisnu	Urticaceae	1700-3000m	Vegetable	Tender shoots	Co	H
Calamus erectus Roxburgh	Phyakre	Areceae	700-1000m	Nuts eaten	Fruit	R	T
Caryota urens L.	Rambhang	Areceae	300-1500m	Seeds is eaten as betel nut	Seeds	R	T
Castanopsis hystrix Miq.	Patle katus	Fagaceae	1600-2400m	Seeds eaten raw and roasted	Seeds	Ab	T
Castanopsis indica (Roxb.) Miq.	Katus	Fagaceae	1200-2900	Seeds roasted and eaten	Seeds	Ab	T
Castanopsis tribuloides (Sm.) A. DC.	Musre katus	Fagaceae	450-2300m	Seeds roasted and eaten	Seeds	Ab	T
Chenopodium album L.	Bethu saag	Chenopodiacee	500-2300m	Vegetable	Young shoots		H
Choeropondias axillaris (Roxb.) B. L. Burtt and A. W. Hill	Lapsi	Anacardiaceae	1150-2000m	Fruit, Fruit is used to make jam	Fruit	Sp	T
Cinnamomum tamala (Buch.-Ham.) Nees and Eberm.	Sinkauli	Lauraceae	450-2000m	Condiments	Bark and leaves	Sp	T
Citrus medica L.	Bimbira	Rutaceae	250-1300m	Used locally in salads	Fruits and peels	Sp	T
Cleistocalyx operculatus (Roxb.) Merr and Perry	Kyamuna	Myrtaceae	800-1600m	Dried and brewed as Hal tea	Leave and buds	Sp	T

Dendrocalamus hamiltonii Nees and Arn. Ex Munro	Tama	Poaceae	400-1000m	vegetable, fermented in making pickles	Young shoots	Co	H
Dioscorea alata L.	Ghartarul	Dioscoreaceae	300-1900m	Cooked and consumed, vegetable	Tubers	Co	C
Dioscorea bulbifera L.	Githa	Dioscoreaceae	150-2100m	Cooked and consumed, vegetable	Tubers	Sp	C
Dioscorea deltoidea Wall.ex Griseb.	Kukur tarul	Dioscoreaceae	450-3000m	Cooked and consumed, vegetable	Tubers	Sp	C
Dioscorea hamiltonii Hook.f.	Ban tarul	Dioscoreace	250-1700m	Cooked and eaten	Tuber	Sp	C
Dioscorea pentaphylla L.	Bhyagur	Dioscoreaceae	500-1500m	Boiled and eaten as well as vegetable	Tubers	Sp	C
Diplazium esculentum (Retzius) Swart	Saune niuro	Athyriaceae	100-1200m	Consumed as vegetable, used to make pickles	Young Shoots and Flower	Ab	H
Diplazium maximum (D. Don) C. Chr.	Danthe niuro	Athyriaceae	400-900m	Consumed as vegetable.	Young Shoots and Flower	Co	H
Diploknema butyracea (Roxb.) Baehni	Chiuri	Sapotaceae	200-1500m	Fruits consumed	Fruits	Co	T
Dryopteris cochleata (D. Don) C. Chr.	Danthe niuro	Dryopteridaceae	2100-3500m	Vegetable	Young Shoots and Flower	Ab	H
Duchesna indica (Andrews) Focke	Bhui Aiselu	Rosaceae	1000-2500m	Consumed ripe fruits	Fruits	Co	H
Eclipta prostrata (L.) L.	Bhringraj	Asteraceae	200-1300m	Vegetable	Leaves	Co	H
Elaeagnus infundibularis Momiy.	Malledo	Elaeagnaceae	1100-2500m	Fruits and is made pickles	Fruit	Sp	S
Elaeocarpus lanceofolius Roxb.	Bhadrase	Elaeocarpaceae	1000-2400m	Ripened fruit is edible	Fruit	Sp	T
Elatostema platyphyllum Wedd.	Gagleto	Urticaceae	700-1900m	Used as vegetable, pickle	Shoots	Ab	H
Entada scandens (L.) Benth	Pangra	Fabaceae	200-900m	Seeds are washed, roasted and eaten	Seeds	Sp	C
Eryngium foetidum L.	Bhote dhania	Apiaceae	500-1900m	Spices and pickles	Leaves	Sp	H
Eugenia Kurzii Duthie	Ambakey	Myrtaceae	1100- 1800m	Fruit pulp is consumed	Fruits	Sp	T
Evodia fraxinifolia (D. Don) Hook.f.	Khanakpa	Rutaceae	1000-2400m	fruits and seeds used in pickles and as appetizer and condiments	Fruits	Sp	T
Fagopyrum dibotrys (D. Don) H. Hara	Tite phapar	Polygonaceae	1500-3400m	Bread	Seeds	Co	H
Ficus auriculata Lour.	Nevara	Moraceae	800-2100m	Fruits are eaten raw	Fruits	Co	T
Ficus benjamina L.	Kabra	Moraceae	400-800m	Leaf buds used locally in making pickles	leaf buds	Co	T
Ficus clavata Wall. Ex Miq.	Lutey Khanew	Moraceae	500-1300m	underground fruit is eaten	Fruits	Co	T
Ficus hirta Vahl.	Khasreto	Moraceae	900-1300m	Edible	Fruits	Co	T
Ficus hispida L.F.	Khasre	Moraceae	450-1100m	Ripe fruits eaten	Fruits	Co	T
Ficus lacor Buch.- Ham.	Kavra	Moraceae	500-800m	Fruits	Fruits	Co	T

Ficus racemosa L.	Dumri	Moraceae	300-900m	Ripe fruits eaten	Fruits	Co	T
Ficus semicordata Buch.-Ham. ex Sm	Khasre Khaneu	Moraceae	200-2700m	Ripe fruits eaten	Fruits	Co	T
Fragaria nubicola Lindl.ex Lacaita	Bhui Aiselu	Rosaceae	1600-4000m	Consumed ripe fruits	Fruits	Co	H
Gaultheria fragrantissima Wall.	Patpate	Ericaceae	1200-2600m	Ripe fruit is eaten raw	Fruit	Sp	T
Girardinia diversifolia (Link) Friis	Bhangre sisnu	Urticaceae	300-3000m	Consumed as vegetable, used to make pickles	Young shoots and flowers	Ab	H
Guizotia abyssinica (L.f.) Cass	Philunge	Asteraceae	600- 2800m	Seeds roasted and made pickles	Seeds	Co	H
Hedgsonia heteroclita Hook.f. and Thomson	Ghiuphal	Cucurbitaceae	300-1500m	Seeds roasted and made pickles	Seeds	R	C
Herpetospermum pedunculosum (Ser.) C.B. Clarke	Jungali Ghiraula	Cucurbitaceae	1000-3600m	Seeds fried and eaten.	Seeds	Sp	C
Holbellia latifolia Wall.	Golpha	Lardizabalaceae	1500-4000m	Ripe fruits are eaten fresh	Fruits	Sp	C
Horsfieldia kingii (J. D. Hooker) Warburg	Ramguwa	Myristicaceae	300-1200m	Eaten nut and unripe fruit is used in making pickles	Fruits	R	T
Houttuynia cordata Thunb.	Gande jhar	Saururaceae	1300-2500m	Used as vegetable, pickle	Shoots	Ab	H
Impatiens bicornuta Wall.	Tiuri	Balsaminaceae	2800- 3700m	vegetable	Young shoots	Ab	H
Juglans regia L.	Okhar	Juglandaceae	1100-2000m	Nuts eaten	Nuts	Ab	T
Laportia terminalis Wight	Patle sisnu	Urticaceae	1900-3300m	Consumed as vegetable, used to make pickles	Young shoots and flowers	Ab	H
Lindera neesiana (Wall ex Nees) Kurz.	Siltimbur	Lauraceae	1800-2400m	Pickles	Seeds	Sp	T
Lithocarpus pachyphylla (Kurz.) Rehder.	Bante	Fagaceae	1700-3000m	Seed is cooked and eaten or grounded into powder to make bread	Seeds	Co	T
Litsea cubeba (Lour.) Pers.	Siltimbur	Lauraceae	300-1700m	Seasoning vegetables and pickles	Seeds	Sp	T
Machilus edulis King.ex Hook.fil.	Pumsi	Lauraceae	1000-2300m	Edible	Fruits	Co	T
Maclura cochichinensis (Lour.) Corner	Bhale phul	Moraceae	400-1800m	Young leaves are eaten raw and fruit is edible	Leaves and fruits	Sp	S
Macropanax dispermus (Wallich ex G. Don) Seemann	Chinde	Araliaceae	700-2200m	Vegetable	Young shoots	Sp	T
Mahonia napaulensis DC.	Mandre chutro	Berberidaceae	1000-2900m	Pickles	Fruit	Sp	T
Melastoma malabathricum L.	Angeree	Melastomataceae	100-2800m	Young shoots are eaten as fresh and cooked vegetable, fleshy pulp of ripe fruit is eaten fresh	Young shoots	Co	S
Mentha arvensis L.	Pudina	Lamiaceae	900-2000m	Leaves used as spices and pickles	Leaves	Co	H

Moringa oleifera Lam.	Sajana	Moringaceae	150-1100m	Used and vegetable	Leaves, flowers and fruits	Co	T
Morus alba L.	Kimbu	Moraceae	700-1600m	Ripe fruits eaten raw, Used in making jam, jellies and drinks	Fruits	Co	T
Myrica esculenta Buch.-Ham.ex D. Don	Kaphal	Myricaceae	1200-2300m	Ripen fruit is consumed	Fruits	Co	T
Nasturtium officinale W. T. Aiton	Simrayo	Brassicaceae	800- 2200m	Vegetable	Leaves	Ab	H
Nephrolepis cordifolia (L.) C. Presl	Pani amala	Nephrolepidaceae	500-2000m	Tubers edible	Tubers	Ab	H
Oroxylum indicum (L.) Benth. Ex Kurz	Totola	Bignoniaceae	300- 1100m	Flower is cooked and eaten as vegetable	Flower	Ab	T
Perilla frutescens (L.) Britton	Silam	Lamiaceae	600-2400m	Pickles	Seeds	Ab	H
Phyllanthus emblica L.	Amala	Phyllanthaceae	150-1400m	Fruits are consumed and used in pickles	Fruits	Co	T
Physalis minima L.	Jungali tamatar	Solanaceae	700- 2100m	Ripened fruits are eaten	Fruits	Co	H
Phytolacca acinosa Roxb.	Jaringo	Phytolacaceae	2200-3200m	Vegetable	Leaves	Sp	H
Piper mullesua Buch.-Ham.ex D. Don	Chabo	piperaceae	400-2500m	Ripe fruits is eaten raw; Flowers added to vegetables for flavouring	Fruits and flowers	Co	C
Polygonum molle D. Don	Thotne	Polygonaceae	1300-4000m	Pickles	Young shoots	Co	H
Prunus cerasoides D. Don	Payun	Rosaceae	1300-2400m	Consumed ripe fruits	Fruits	Co	T
Pteris biaurita L.	Dwathey niuro	Pteridaceae	1100-2300m	Vegetable	Young frond	Co	H
Pyrularia edulis (Wall.) A. DC.	Amphi	Santalaceae	1600-1800m	Fruits consumed	Fruits	Sp	T
Pyrus pashia Buch.-Ham.ex D. Don	Mael	Rosaceae	700-2600m	Comsumed ripe fruits, used in making jams	Fruits	Sp	T
Quercus glauca Thunb.	Phalant	Fagaceae	2100- 3000m	Seeds	Seeds	Sp	T
Rheum nobile Hook.f. and Thoms.	Padamchal	Polygonaceae	3800-5000m	Consumed as vegetable, used to make pickles	Aerial parts	Sp	H
Rhododendron arboreum Smith	Lali gurans	Ericaceae	1400-3600m	Flower is used to prepare local wine	Flowers	Ab	T
Rhus Chinensis Miller	Bhakimlo	Anacardiaceae	900-2200m	Fruit is used to make jam	Fruits	Co	T
Rubus ellipticus Sm.	Aiselu	Rosaceae	1400-2600m	Consumed ripe fruits	Fruits	Co	S
Rubus indicus Thunb.	Jungali aiselu	Rosaceae	1100-2900m	Ripe fruit is eaten	Fruits	Sp	S
Schisandra grandiflora (Wall.) Hook.f. and Thomson	Singauto	Schisandraceae	1700-3300m	Raw or cooked fruit is eaten	Fruits	Sp	C
Schisandra propinqua (Wall.) Baill.	Nyalchu	Schisandraceae	700-3100m	Ripe fruit is eaten	Fruits	Sp	C
Solanum nigrum L.	Kalo bihi	Solanaceae	900-2900m	Fruits edible and eaten as vegetable	Fruits	Sp	H

Solanum pseudocapsicum L.	NA	Solanaceae	650-1800m	Green fruit is eaten as vegetable	Fruits	Co	S
Solena amplexicaulis (Lam.) Gandhi	Ban kakri	Cucurbitaceae	700- 1500m	Fruits	Fruit	Sp	C
Syzygium cumini (L.) Skeels	Jamun	Myrtaceae	300-1200m	Fruits edible	Fruits	Co	T
Talinum portulacifolium (Forssk.) Asch.ex Scheinf.	Dalda saag	Portulacaceae	150- 2200m	Vegetable	Leaves and young stem	Sp	H
Tamarindus indica L.	Titri	Fabaceae	200-900m	Fruit, used in making pickles	Fruit	Sp	T
Tectaria coadunata (J. Sm.) C. Chr.	Kalo unew	Tectariaceae	500-2500m	Vegetable	Young frond	Co	H
Terminalia bellirica (Gaertn.) Roxb.	Barra	Combretaceae	100-300m	Seeds are chewed	Seeds	Sp	T
Terminalia chebula Retz.	Harra	Combretaceae	150-1100m	Fruit	Fruit	Sp	T
Trichosanthes tricuspidata Lour.	Indreni	Cucurbitaceae	1200-2300m	Roasted seeds is used in making pickles	Seeds	Co	C
Tupistra nutans Wall.ex Lindl.	Nakima	Aspergaceae	1000- 1800m	Inflorescence is eaten as vegetable	Inflore scence	Co	H
Urtica dioca L.	Gharia sisnu	Urticaceae	700-4000m	Consumed as vegetable, used to make pickles	Young shoots and flowers	Co	H
Viburnum erubescens Wall	Asare	Adoxaceae	1500-3300m	fruit is eaten raw or cooked	Fruit	Sp	S
Zanthoxylum armatum DC.	Boke timur	Rutaceae	1100-2500m	Fruits is used as spices and pickles	Fruits	Sp	T
Ziziphus mauritiana Lam.	Bayer	Rhamnaceae	200-1700m	Fruit is eaten raw or preserved	Fruits	Co	T
Heracleum wallichii DC	Chimphing	Apiaceae	1700-4000m	Seeds used in food seasoning and for making pickles	Seeds	Sp	H
Cissampelos pareira L.	Tamarke	Menipermaceae	500-1000m	Eaten as vegetable	Young shoots	Co	C
Lepidium sativum L.	Changsur	Brassicaceae	200-3000m	Shoots eaten as vegetable	Shoots	Co	H

CONCLUSION

The result of this study have revealed that traditional knowledge on the use of edible plants, their habitat distribution harvesting time is still maintained among rural and tribal people of West Sikkim district, Sikkim, India. The preservation of this knowledge is due to continued reliance of local people on the Wild Edible plants. The Wild Edible plants have the potentialities to become valuable staple food and important alternative to the usual food crops. Analysis of the result showed that, many of these wild Edible plants of this district are rapidly shrinking due to population explosion, modernisation, industrialisation, agricultural land expansion etc. and also lack of sustainable harvesting practices (destructive harvesting practices by locals as branches are lopped to collect fruit). The result also revealed that many wild species under growing threat from various anthropogenic factors. Thus, public awareness and community based management need to be encourage at all levels alongside of urgent collection of germplasm. It has thus been instrumental for documentation of traditional knowledge about the intangible cultural heritage concerning traditional usage of plants. Efforts to conserve biodiversity and

preserve traditional food system need to be combined and enhanced for the benefit of the posterity. Further studies providing this data would greatly assist in promoting the involvement of local people in managing their resources.

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