International Journal of Advanced Research in Biological Sciences
ISSN: 2348-8069
www.ijarbs.com
(A Peer Reviewed, Referred, Indexed and Open Access Journal)
DOI: 10.22192/ijarbs Coden: IJARQG (USA) Volume 10, Issue 1 -2023

Research Article

DOI: http://dx.doi.org/10.22192/ijarbs.2023.10.01.010

Phytosociological vis-a-vis Cultural implications of homestead plant species of Khampti tribe, Arunachal Pradesh

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Abstract

This study was conducted in 15 Khampti villages of Namsai district, Arunachal Pradesh during 2018-19. Objective of the study was to identify tree, shrub and herb species utilized by the Khampti people available in their homesteads for their livelihood. The quadrate method was followed to record tree and shrub species found in 225 homesteads of 15 Khampti villages. Shanon-Weiner Diversity Index, Margalef's index and Sorenson's Similarity Index were analysed for determining the biodiversity of the villages. A total of 105 tree species and 65 shrub and climber species were recorded from Khampti homesteads. The common species found all the Khampti villages were *Cocos nucifera* L., *Areca catechu* L., *Livistona jenkinsiana* Griff., *Sapindus mukorossi* Gaertn., *Albizia chinensis* (Osbeck) Merr., *Albizia lucidior* (Steud.) Nielson., *Bambusa tulda* Roxb., *Citrus limon* (L.) Osbeck. The study exposed that the tree species diversity was highest in Mankao village and lowest in Manmow village. The Species Diversity of shrubs was recorded as highest in Sulungtoo and lowest in Manmow village. On the other hand, the Species Richness for tree species was marked highest in Kherem village and lowest in Wengko village. While Species richness for shrub species was found highest in New Lathao village and lowest in Old Mohong village. The Khampties were rich in traditional knowledge for utilization of homestead plants and reflected in their strong cultural practices. This study produced preliminary data on the phytodiversity of the Khampti homesteads for future scientific activities and also attempted to find out cultural linkages with phytodiversity of the Khampti tribe.

Keywords: Phytodiversity, Khampti tribe, homesteads, livelihood

Introduction

The homesteads play an important role in socio-economic and cultural heritage of tribal community and could be a prototype of traditional agroforestry (Hazarika et al., 2021). It has immense influence on the daily life of tribal communities in remote places of the country. These homesteads are source of provide food, fodder, medicines, construction materials etc. for the family. A well-designed homestead rich in biodiversity also acts as a good source of income for the family. The layered canopy configurations and a mixture of compatible species are the most conspicuous characteristics of all home-gardens (Nair, 1993). Thus, homesteads are important land form of optimum utilisation of growing trees, shrubs and herb. Canopy structure of a homestead consist of a herbaceous layer at the lower level, a tree layer at the upper level and an intermediate layer of shrubs (Hazarika et al., 2021). Along with these plants homestead owner grows cash crops as intercrop for making the maximum profit. Homestead also provides almost all the possible household goods and services of daily consumption with sources vitamin A, vitamin C, iron, and calcium (Talukdar et al., 2000).

The Khampti people of Namsai district, Arunachal Pradesh are also known for their homestead farming. They were migrated from Myanmar since the 13th century and settled themselves in Namsai, presently in Arunachal Pradesh with homesteads surroundings their house called Chang Ghar (Geyi, 2021).Their homesteads are sizable and have a rich and diverse flora (Hazarika et al., 2021). The diversity of plant species in homestead was reported more in comparison to the other conventional agricultural practices. Homestead agroforestry is considered as an inexpensive exercise for maintaining the soil's fertility, as well as combating erosion and nutrient leaching (Ojo, 1966). Above all agroforestry helps to conserve biological diversity by providing other ecosystem services such as erosion control and water recharge, thereby preventing the degradation and loss of surrounding habitat (Jose 2009).

The people of Khampti tribe have an intense attachment with the nature. They have been dependent on nature for their basic needs of food, water and shelter. They have huge of knowledge on traditional medicines acquired with time and passed on generation after generation (Khatib et al., 2021.). Their food habit, lifestyle and cultural heritage are built with time based on the available plant species in their surroundings (Nimachow et al., 2008).

This study was primarily done to select the productive components in their homesteads which are directly link with the livelihood, culture and are suitable to include in the proposed agroforestry system trials. Apart from that it was also intended to know about the extent of biodiversity that has been traditionally conserved in Khampti homesteads of Namsai district, Arunachal Pradesh.

Materials and Methods

Study area

The study was conducted at 15 villages of Namsai district of Arunachal Pradesh and GPS locations of Khampti villages are presented in fig 1. The villages were Old Mohong, Pathar Gaon, Piyong, Lathao-1. New Lathao, Sulungtoo, Kherem, Marua camp, Mankao, New Mohong, Manphaiseng, Manmow, Wagon Pathar, Jenglai, Wengko. The district is newly formed in 2014 and lies between 95.45 to 96.20 E longitudes/ 27.30 to 27.55 N latitudes with a total geographical area about 1587 sq km. The political boundary of the district shares the boundary with Tinsukia district of Assam, towards the West & South West; in the South & South East it shares the boundary with Changlang district. Likewise towards the East it shares the boundary with Anjaw & Lohit and in the North with Lohit district of Arunachal Pradesh. The area has a tropical climate with an annual rainfall of about 3500-4000 mm and elevation of around 156 m from Mean Sea Level (MSL). The average temperature ranges between 28ºC – 40ºC in summer and 10 ºC- 25 ºC during winter.

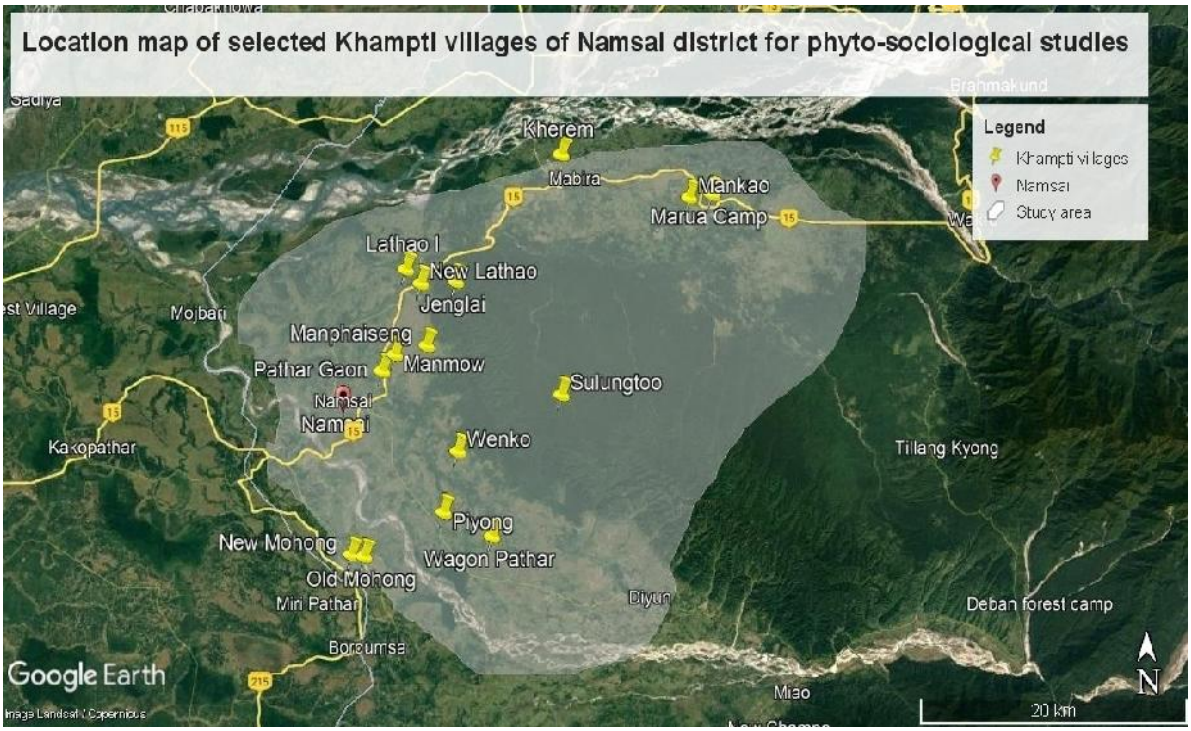

Fig 1. Location map of selected Khampti villages of Namsai district for phyto-sociological studies

Data collection

Multistage purposive randomized sampling technique was exercised to select the samples for the study to determine the biodiversity, socio-cultural relationship with the plant species present in homesteads of 15 Khampti villages distributed in 5 administrative Circles of the Namsai district of Arunachal Pradesh. The species recorded in the survey were classified as trees and shrubs. Prior permission was taken from the owners of the homesteads while conducting the survey. A total of 225 homesteads were surveyed to document plant species from 15 randomly selected homesteads of each of the 15 Khampti village. The data obtained by placing quadrates in each of the 15 villages. For tree species the size of the quadrate was 10 m × 10 m and for shrub species the size of the quadrate was 5 m × 5 m. Interviews were also done with the locals with the help of a questionnaire for documenting the use of different plant species in their cultural and traditional practices. Following equations were used for determining the biodiversity of the different homesteads.

The Shanon-Wiener Index: The species diversity within a community is determined by using the Shanon-Weiner Index. It represents the number of species occur in a habitat (richness) and their relative abundance (evenness).

$$H = -\Sigma pi\ (lnpi)$$

Where, pi = Proportion of individuals of each species,ln = Natural logarithm. H= The Shanon-Wiener Index (Rajasekaran, et al., 2017).

Species Evenness: Species evenness represents the relative abundance of the different species that constitute the richness of an area. The formula for calculating evenness (E) is given by Magurran (1988).

$$E = H/lnS$$

Where, E = Evenness of the species in an ecosystem, H = Shannon index, S = number of species (Agroforestry, Livelihood and Biodiversity Nexus: The Case of Madhupur Tract, Bangladesh (Islam et.al., 2022)

Species Richness: Species richness denotes the number of species present in a community. It is measured using Margalef Index equation.

Margalef Index (**Da) = S-1/lnN**

Where, S= Total no. of taxa N= No. of individual in all species (Rajasekaran, et al., 2017).

Importance Value Index (IVI): It is calculated with the help of Relative Frequency,

Relative Density and Relative Dominance of the different species found in the 15 quadrates of each Khampti village.

IVI = Relative frequency+ Relative dominance+ Relative density

Similarity Index: The similarity index of the homesteads plan species were calculated using Sorenson's Similarity Coefficient (Ss).

Ss=2a/ 2a+b+c

Where, a- No. of species common to all the habitats; b- No. of species occurring in Habitat b, c- No. of species occurring in Habitat c

Use Value (UV): The Use value was calculated first by finding out the Use Report (UR) of the desired species. The UR of a species or its importance in the culture of a community is determined by its rate of mentioning or its mention frequency by informants. The UR of the species of plants being utilized was calculated by using the formula (Dossou et al., 2012; Khatib et al., 2021)

UR=Ni/n

Where, Ni is the number of times a particular species was mentioned by the informents; n is the total number of times that all species were mentioned

The Use Value was calculated using the formula (Tabuti et al., 2003)

UV=ρUri/N

Where URi is the total number of UR per plants and N is the total number of informants.

Measuring collar diameter of tree species in Old Mohong

Measuring collar diameter of a tree in Lathao Measuring collar diameter of a tree in Lathao

Fig 2. A few moments of measuring plant girth in different villages of Khampti homesteads, Namsai, Arunachal Pradesh while applying quadrate method.

Results

A total of 105 tree species belongs to 42 plant families along with local name, family and status of plant species recorded in 225 homesteads of 15 Khampti villages of Namsai district, Arunachal Pradesh were presented in table1. Of the tree species recorded from homesteads 2 species i.e. *Aquilaria malaccensis* and *Hydnocarpus kurzii* are critically endangered); *Livistona jenkinsiana* is endangered; 4 species i.e. *Aegle marmelos*, *Phyllantus acidus*, *Terminalia myriocarpa)* and *Saraca asoca* are *vulnerable. Another 7 tree species i.e. Averrhoa carambola*, *Azadirachta indica*, *Garcinia pendunculata*, *Litchi sinensis*, *Litsea glutinous*, *Litsea monopelata* and *Melia azedarach* are near threatened. The shrub and climber species also occupy a major share in species composition in Khampti homesteads with 68 species and were presented in table 2. *Garcinia lanciefolia* is an endangered shrub species found in Khampti homesteads. *Flemingia strobilifera* is a threatened species. Likewise, *Justicia gendarussa* is a vulnerable plant of Khampti homesteads and extinct in wild. The status of *Clerodendron colebrookianum* a traditional medicinal plant is vulnerable.

Lower canopy plant species were mostly cultivated herb species in different seasons of the year and presented in table 7.

Importance Value Index (IVI)

IVI of Tree species

Importance value index (IVI) of homesteads tree species in 15 Khampti villages of Namsai district, Arunachal Pradesh is presented in Table 3. Among the tree species the highest IVI was recorded in Old Mohong for *Mangifera indica*. (19.04) and *Litchi sinensis* (2.09) had the lowest IVI. In Pathar Gaon, *Dillenia indica* (15.35) had the highest IVI and *Zizyphus oenopila* (1.84) had the lowest IVI. In Piyong *Areca catechu* (13.60) had the highest IVI and *Nyctanthes arbor-tristis* (1.92) had the lowest IVI. In Lathao, *Aquilaria malaccensis* (16.77) had been calculated for the highest IVI and *Cascabella thevetia* (3.46) had the lowest IVI. In New Lathao, *Bambusa tulda* (17.97) had the highest IVI and *Cascabella thevetia* (2.65) had the lowest IVI. In Sulungtoo, *Bambusa tulda* (17.68) had the highest IVI and *Cascabella thevetia* (2.08) had the lowest IVI. In Kherem *Areca catechu* (18.63) had the highest IVI and *Cascabella thevetia* (1.93) had the lowest IVI. In Marua Camp, *Bambusa tulda* (21.34) had the highest IVI and *Cascabella thevetia* (1.78) had the lowest IVI. In Mankao *Oroxylum indicum* (26.42) had the highest IVI and *Plumeria obusta* (1.6) had the lowest IVI. In New Mohong, *Bambusa balcooa* (19.83) had the highest IVI and *Cascabella thevetia* (2.15) had the lowest IVI. In Manphaiseng, *Bambusa tulda* (16.56) occupied the highest IVI and *Musa acuminata* (2.34) had the lowest IVI. In Manmow, *Bambusa tulda* (23.98) had the highest IVI and *Garcinia pendunculata* (2.79) had shown the lowest IVI. In Wagon Pathar, *Bambusa tulda* showed the highest IVI (23.49) and *Mangifera sylvetica* L (2.49) had the lowest IVI. In Jenglai, the highest IVI was calculated for *Livistona jenkinsiana* (20.89) and *Cascabella thevetia* (2.43) had the lowest IVI. In Wengko village, IVI of *Dillenia indica* (22.16) calculated for the highest value and *Morus nigra* (2.55) had score of the lowest IVI.

Table 1. Tree species recorded in the 15 Khampti villages of Namsai district, Arunachal Pradesh [Local name: Khampti(K); Assamese (A)]

Sl No.	Tree Species	Local name	Family	Status
1.	*Aegle marmelos* (L.) Corrêa	Bel(A), Maklak (K)	Rutaceae	Vulnerable
2.	*Aesculus assamica* Griff.	Maham ling(K)	Sapindaceae	Endemic
3.	*Ailanthus integrifolia* Lam.	Borpat(A)	Simaroubaceae	Least concern
4.	*Albizia arunachalensis* Sahni et Naithani	Shaw(A)	Mimosaceae	Endemic
5.	*Albizia chinensis* (Osbeck) Merr.	Sagurenka(K)	Mimosaceae	Least concern
6.	*Albizia lebbeck* (L.) Benth.	Siris(A)	Mimosaceae	Least concern
7.	*Albizia lucidior* (Steud.) Nielson.	Moj(A)	Mimosaceae	Least concern
8.	*Alstonia scholaris* (L.) R.Br	Maitang(K)	Apocynaceae	Lower risk/conservation dependent
9.	*Aporosa octandra* (Roxb) Muell	Tasang(K)	Phyllanthaceae	
10.	*Aquilaria malaccensis* Lam.	Sasi/Tun namsasa(K)	Thymelaeaceae	Critically endangered/ endemic
11.	*Areca catechu* L.	Mak mow/Kha.Ton(K)	Arecaceae	Lower risk/conservation dependent
12.	*Artocarpus heterophyllus* Lam.	Tun-Malang (k)	Moraceae	Lower risk/conservation dependent
13.	*Artocarpus lacucha* Buch-Ham.	Haabang(K)	Phyllanthaceae	
14.	*Averrhoa carambola* L.	Me phung/ Kurangi(K)	Oxalidaceae	Near threatened
15.	*Azadirachta indica* A.Juss.	Mahaneem(K)	Meliaceae	Near threatened
16.	*Baccaurea motleyana* Müll.Arg.	Ma phai (K)	Phyllanthaceae	Lower risk/conservation dependent
17.	*Baccaurea ramiflora* Lour.	Ma phai(K)	Phyllanthaceae	Lower risk/conservation dependent
18.	*Balakata baccata* (Roxb.) Esser	Seleng (A)	Euphorbiaceae	Lower risk/conservation dependent
19.	*Bambusa balcooa* Roxb.	Mai sang nam (K)	Poaceae	Not Determined
20.	*Bambusa nutans* Munro.	Mai sang koi(K)	Poaceae	Not Determined
21.	*Bambusatulda* Roxb.	Mabang (K)	Poaceae	Not Determined
22.	*Bauhinia variegata* (L.) Benth.	Sekang(K)	Fabaceae	Least Concern
23.	*Bischofia javanica* Blume	Urium(A)	Phyllanthaceae	Lower risk/conservation dependent
24.	*Bombax ceiba* L.	Mai liu (K)	Bombacaceae	Least concern
25.	*Carallia brachiata* (Lour.) Merr.	Mahow on (K)	Rhizophoraceae	Least concern
26.	*Caryota urens* L.	Kunhang (K)	Arecaceae	Least concern
27.	*Cascabella thevetia* (L.) Lippold	Korobi (A)	Apocynaceae	Lower risk/conservation dependent
28.	*Cephalostachyum pallidum* Munro.	Khawlam banh (K)	Bambusaceae	Least concern

29.	*Chukrasia tabularis* A. Juss.	Poma (A)	Meliaceae	Lower risk/conservation dependent
30.	*Cinnamomum tamala* (Buch.-Ham.) T.Nees & C.H.Eberm.	Tejpat (A)	Lauraceeae	Lower risk/conservation dependent
31.	*Cinnamomum zeylenicum* Br.	Dalcheni (A)	Lauraceae	Lower risk/conservation dependent
32.	*Citrus grandis* (L.) Osbeck	RobabTenga (A)	Rutaceae	Lower risk/conservation dependent
33.	*Cocos nucifera* L.	Maksaanphow(K)	Arecaceae	Lower risk/conservation dependent
34.	*Cordia dichotoma* G.Forst.	Mawphaman(K)	Boraginaceae	Lower risk/conservation dependent
35.	*Croton roxburghii* Bolar.	Hongkii (K)	Euphorbiaceae	Lower risk/conservation dependent
36.	*Delonix regia* (Boj. ex Hook.) Raf	Krishnachura(A)	Fabaceae	Lower risk/conservation dependent
37.	*Dendrocalamus giganteus* Munro	Boriyal Banh IA)	Poaceae	Lower risk/conservation dependent
38.	*Dillenia indica* L.	Tun-Makchang (K)	Dilleniaceae	Lower risk/conservation dependent
39.	*Diospyros kaki L.F*	Halwa tendu (H)	Ebenaceae	Lower risk/conservation dependent
40.	*Duabanga grandiflora* (Roxb. ex DC) Walpers	Khakon (A)	Lythraceae	Lower risk/conservation dependent
41.	*Elaeis guineensis* Jacq.	Plam oil (E)	Arecaceae	Lower risk/conservation dependent
42.	*Elaeocarpus floribundus* Blume.	Jalphai (A)	Elaecarpaceae	Lower risk/conservation dependent
43.	*Elaeocarpus serratus* L.	Rudraksha (A)	Elaecarpaceae	Lower risk/conservation dependent
44.	*Erythrina variegate* L.	Maga making(K)	Fabaceae	Lower risk/conservation dependent
45.	*Ficus auriculata* Lour.	Manau(K)	Moraceae	Lower risk/conservation dependent
46.	*Ficus hispida* L.f.	Mukanpong/ Mawa (K)	Moraceae	Lower risk/conservation dependent
47.	*Ficus religiosa* L.	Anhot (A)	Moraceae	Lower risk/conservation dependent
48.	*Garcinia cowa* Roxb.	Kujithekera (K)	Clusiaceae	Lower risk/conservation dependent
49.	*Garcinia pendunculata* Roxb. ex Buch. Ham	Mannang/ Mhahau(K)	Clusieaceae	Near threatened
50.	*Gmelina arborea* Roxb.	Gamari(A)	Verbenaceae	Lower risk/conservation dependent
51.	*Grewia disperma* L.	-	Malvaceae	Lower risk/conservation dependent
52.	*Gynocardia odorata* R.Br.	Makampo(K)	Flacourtiaceae	Vulnerable
53.	*Heteropanax fragrans* Roxb.	Keseru (A)	Meliaceae	Lower risk/conservation dependent
54.	*Hydnocarpus kurzii* (King) Warb	Makhapong (K)	Achariaceae	Critically endangered
55.	*Lagerstroemia speciosa* (L) Pers.	Safed ajar (K)	Lythraceae	Lower risk/conservation dependent
56.	*Lannea coromandelica* (Houtt.) Merr.	Jia (A)	Anacardiaceae	Lower risk/conservation dependent
57.	*Litchi sinensis* J. Gmelin	Lichu(K)	Sapindaceae	Near threatened

58.	*Litsea cubeba* (Lour). Pers.	Rukmeer (K)	Lauraceae	Lower risk/conservation dependent
59.	*Litsea cubeba* (Lour).C.B. Rob.	Baghnala(A)	Lauraceae	Near threatened
60.	*Litsea monopelata* Roxb.	Hoi phet(K)	Lauraceae	Near threatened
61.	*Livistona jenkinsiana* Griff.	Tong-ko(K)	Arecaceae	Endangered
62.	*Magnifera indica* L.	Momung (K)	Anacardiaceae	Lower risk/conservation dependent
63.	*Magnolia hodgsonii* (Hook.f. & Thomson) H. Keng	Borhmthuri (A)	Magnoliaceae	Lower risk/conservation dependent
64.	*Mallotus paniculatus* (Lam.) Mull.Arg.	Morolia (A)	Euphorbiaceae	Lower risk/conservation dependent
65.	*Mallotus tetracoccus* (Roxb.) Kurz.	Bormorolia (A)	Euphorbiaceae	Lower risk/conservation dependent
66.	*Melia azedarach* L.	Ghora neem (A)	Meliaceae	Near threatened
67.	*Melia composita* Willd.	Pahari neem(A)	Meliaceae	Lower risk/conservation dependent
68.	*Mesua ferrea* L.	Kamko (K)	Callophyllaceae	Lower risk/conservation dependent
69.	*Moringa oleifera* Lam.	Sajina (A)	Moringaceae	Lower risk/conservation dependent
70.	*Morus laevigata* (L.)	Bola(A)	Moraceae	Lower risk/conservation dependent
71.	*Morus nigra* L.	Nuni(A)	Moraceae	Lower risk/conservation dependent
72.	*Musa acuminata* Colla.	Koi(K)	Musaceae	Lower risk/conservation dependent
73.	*Musa cavendish* Lamb.	Jahanji(A)	Musaceae	Lower risk/conservation dependent
74.	*Musa paradisiaca* L.	Jahaji-kol (A)	Musaceae	Lower risk/conservation dependent
75.	*Myrica esculenta* Ham.	Nogatenga (A)	Myricaceae	Lower risk/conservation dependent
76.	*Neolemarkiacadamba*(Roxb.) Miq	Kadam (A)	Rubiaceae	Lower risk/conservation dependent
77.	*Nyctanthes arbor-tristis* L.	Kansuki (K)	Oleaceae	Lower risk/conservation dependent
78.	*Oroxylum indicum* (L.) Benth. Ex Kurz	Bhatgila (A)	Bignoniaceae	Lower risk/conservation dependent
79.	*Phoebe attenuate* Nees.	Bonsum(A)	Lauraceae	Lower risk/conservation dependent
80.	*Phoenix dactylifera* L.	Kejur(A)	Arecaceae	Rare
81.	*Phyllanthus embilica* L.	Amlokhi (A)	Phyllanthaceae	Lower risk/conservation dependent
82.	*Phyllantus acidus* (L.) Skeels.	Por Amlokhi (A)	Phyllanthaceae	Endangered/vulnerable
83.	*Plumeria obusta* L.	Gulonchi(A)	Apocynaceae	Lower risk/conservation dependent
84.	*Premna benghalensis* C.B.Clarke	Gohora(A)	Lamiaceae	Lower risk/conservation dependent
85.	*Prunica granatum* L.	Dalim (A)	Lythraceae	Lower risk/conservation dependent
86.	*Prunus persica* (L.) Batsch	Aam-toh (K)	Rosaceae	Lower risk/conservation dependent
87.	*Psidium guajava* L.	Mantaka (K)	Myrtaceae	Lower risk/conservation dependent

88.	*Pyrus communis* L.	Naspoti(A)	Rosaceae	Lower risk/conservation dependent
89.	*Pyrus pyrifolia* (Burm.) Nak.	Naspoti (A)	Rosaceae	Lower risk/conservation dependent
90.	*Sapindus mukorossi* Gaertn.	Maksak (K)	Sapindaceae	Lower risk/conservation dependent
91.	*Saraca asoca* (Roxb.)Willd	Asoka(A)	Fabaceae	Endangered/vulnerable
92.	*Spondias pinnata* (L.f.) Kurz	Mokog (K)	Anacardiaceae	Critically endangered / vulnerable
93.	*Sterculia villosa* Roxb.	Iswarai (K)	Sterculiaceae	Lower risk/conservation dependent
94.	*Stereospermum chelenoides* DC.	Paroli (A)	Bignoniaceae	Lower risk/conservation dependent
95.	*Syzygium cumini* (L.) Skeels.	Jamun(A)	Myrtaceae	Lower risk/conservation dependent
96.	*Syzygium jambos* (L.) Alston	Golapi Jamun (A)	Myrtaceae	Lower risk/conservation dependent
97.	*Talauma hodgsonii* Hk. f. & Thomson	Borhumthuri (A)	Magnoliaceae	Lower risk/conservation dependent
98.	*Tamarindus indica* L.	Mekeng(K)	Fabaceae	Lower risk/conservation dependent
99.	*Tectona grandis* Linn.	Segun (A)	Verbenaceae	Introduced
100.	*Terminalia arjuna* Roxb.	Arjun gose (A)	Combretaceae	Lower risk/conservation dependent
101.	*Terminalia chebula* Retz.	Manaa (K)	Combretaceae	Lower risk/conservation dependent
102.	*Terminalia myriocarpa* Heurck and Mull. Arg.	Holokh (A)	Combretaceae	Vulnerable
103.	*Vitex peduncularis f.* Roxb.(C.B. Clarke) Molden	Osai (A)	Verbenaceae	Lower risk/conservation dependent
104.	*Zizyphus mauritiana* Lam.	Mokho (K)	Rhamnaceae	Lower risk/conservation dependent
105.	*Zizyphus oenopila* (L) Mill	Bogori (A)	Rhamnaceae	Lower risk/conservation dependent

Table 2. Shrub and climber species recorded in the 15 Khampti villages of Namsai district, Arunachal Pradesh

Sl No	Species Name	Khampti name	Local name	Family	Status
1.	*Acacia fernasiana* L.	Korom neng	Tarua kadam	Fabaceae	Lower risk/conservation dependent
2.	*Alangium chinense* (Lour.) Harms.	Thuru-rah	Sikamorolia	Alangiaceae	Least concern
3.	*Allamanda cathartica* L.	Yakunglota	Korobiphul	Apocynaceae	Least concern
4.	*Adhatoda zeylanica* Medic.	Bogabahak	Bogabahak	Acanthaceae	Lower risk
5.	*Bougainvillea glabra* Choisy	Bougainvillia	Bougainvillia	Nyctanginaceae	Conservation dependent
6.	*Bougainvillea spectabilis* L.	Bougainvillia	Bougainvillia	Nyctanginaceae	Least concern
7.	*Buddleja asiatica* Lour.	Bana	Pisola	Scrophulariaceae	Least concern
8.	*Caesalpinia bonduc* (L) Roxb.	Leta guti	Leta guti	Fabaceae	Least concern
9.	*Citrus maxima* (Burm) Meer	Mak lung	Bortenga	Rutaceae	Lower risk
10.	*Calamus tenuis* Roxb.	Munn Khum	Jati bet	Arecaceae	Least concern
11.	*Calotropis procera* Br.	Akon-Asing	Akon	Apocynaceae	Least concern
12.	*Camellia sinensis* (L.) Kuntze	Toon neng	Sah	Theaceae	Least concern
13.	*Citrus limon* (L.) Osbeck	Tun ma lue	Pati nemu	Rutaceae	Lower risk
14.	*Citrus medica* L	Maksaneng	RobabTenga	Rutaceae	Lest concern
15.	*Citrus reticulata* Blanco	Makmighi	Komolatenga	Rutaceae	Lower risk
16.	*Citrus x sinensis* (L.) Osbeck	Mingi	Komolatenga	Rutaceae	Lower risk/
17.	*Citrus limetta* Risso	Mousami	Mousami	Rutaceae	Lower risk
18.	*Clerodendron colebrookianum* Walp	Patakkhai	Nefafu	Verbenaceae	Vulnerable
19.	*Clerodendrum grandulosum* (L.)				Lower risk
20.	*Clerodendrum indicum* (L.)Kuntze	Patuiya	Akal bih	Verbenaceae	Lower risk
21.	*Clerodendrum infortunatum* L.	-	Dhapattita	Verbenaceae	Lower risk
22.	*Clerodendrum thomsoniae* Balf.f.	-		Lamiaceae	Lower risk
23.	*Codiaeum variegatum* (L.) Rumph. ex A.Juss.	-	Pat bahar	Euphorbiaceae	Conservation dependent
24.	*Croton tiglium* L.	Saklang	Konibih	Euphorbiaceae	Lower risk
25.	*Datura innoxia* Mill.	Pukumii	Datura	Solanaceae	conservation dependent

26.	*Derris elliptica* (Wall.) Benth.	-	Etamchali	Fabaceae	conservation dependent
27.	*Dracena fragrans* (L.) Ker Gawl.	-		Asparagaceae	conservation dependent
28.	*Duranta repens* Linn.		Duranta	Verbenaceae	Introduced
29.	*Euphorbia cotinifolia* L		Red Spurge	Euphorbiaceae	conservation dependent
30.	*Euphorbia pulcherrima* Willd. ex Klotzsch.	Sepak	Poinsettia,	Euphorbiaceae	conservation dependent
31.	*Flemingia strobilifera* (L.) W.T.Aiton		Makhioti	Fabaceae	Near threatened
32.	*Garcinia lanciefolia* Roxb.		RupohiThekera	Clusieaceae	Endangered
33.	*Gardenia jasminoides* J.Ellis		Tagarphul	Apocynaceae	Near Threatened
34.	*Gaultheria fragrantissima*Wall.	Shegshing mrep	Gandapura	Ericaceae	conservation dependent
35.	*Glyscosmispentaphylla*(Retz.) DC	Chauldhuwa	Hengenapoka	Rutaceae	Lower risk
36.	*Grewia asiatica* L.		Kukurhuta	Tiliaceae	conservation dependent
37.	*Hibiscus rosa-chinensis* L.	Nognangtibi	Joba	Malvaceae	Lower risk/conservation dependent
38.	*Hibiscus syriacus* L.	Nongnangtibe		Malvaceae	conservation dependent
39.	*Holmskioldia sanguina* Retz.		GhantiPhul	Verbenaceae	Lower risk/conservation dependent
40.	*Ixora chinensis* Lam.		Ixora	Rubiaceae	conservation dependent
41.	*Justicia gendarussa* Burm.f.		Jatrasidhi	Acanthaceae	Extinct in wild/ Vulnerable
42.	*Lawsonia inermis* L.		Jetuka	Lythraceae	conservation dependent
43.	*Manihot esculenta* Crantz	Shingjoktang	Simolu Alu	Euphorbiaceae	conservation dependent
44.	*Melastoma malabathricum* L.	Mohapatta	Phutuka	Melastomataceae	Lower risk/conservation dependent
45.	*Murraya koenigii* (L.) Sprenge	Hom	Narasingha	Rutaceae	Lower risk
46.	*Murraya paniculata* (L.) Jack	Mutangkaril	Kamini	Rutaceae	Lower risk
47.	*Nerium indicum* Mill.	Neram	Korabi	Apocynaceae	
48.	*Nerium oleander* L.	Roktokorobi	Rongakorobi	Apocyanaceae	Lower risk
49.	*Passiflora quadrangularis* L.				conservation dependent
50.	*Phlogachanthus thyrsiflorus* Nees.	Mochomkhum	Titaphul	Rubiaceae	Endemic
51.	*Phlogachanthus tubiflorus* Nees.	Mochomkhum	Titaphul	Rubiaceae	Endemic

52.	*Phlogachanthus thyrsiformis* (Roxb.) Nees.	Mochomkhum	Titaphul	Rubiaceae	Endemic
53.	*Picrasma javanica* Bl	Tita sasi	Bonposola	Simaroubaceae	Not determined
54.	*Piper betle* L.	Pan	Pan	Piperaceae	Conservation dependent
55.	*Prunica granatum* L.	Dalim	Dalim	Lythraceae	Conservation dependent
56.	*Pyrus communis* L.	Glung	Nas poti	Rosaceae	Conservation dependent
57.	*Quisqualis indica* L.	Suangjaik	Malati	Combretaceae	Conservation dependent
58.	*Ricinus communis* L.	Ton kong	era	Euphorbiaceae	Near Threatened
59.	*Rosa chinensis* L.	kathgulap	RongaGolap	Rosaceae	Not determined
60.	*Rosa indica* L.		Boga Golap	Rosaceae	Not determined
61.	*Sarcochlamys pulcherrima* Gaudich.	Mesaki	Mesaki	Urticaceae	Not determined
62.	*Sesbania grandiflora* (L.) Poir.	Bog	Bog phul	Fabaceae	Not determined
63.	*Tabernaemontana divaricata* L.	Mok-ya-khow	Kathanaphul	Apocynaceae	Lower risk
64.	*Trevesia palmate* (Roxb. ex Lindl.) Vis.	Katta pul	Karabi	Araliaceae	Conservation dependent
65.	*Zanthoxylum acanthopodium* DC.	Mekat	Masala pat	Rutaceae	Near Threatened

Table 3. Importance value index of homesteads tree species in 15 Khampti villages of Namsai district, Arunachal Pradesh, India

Tree species in homesteads	Old Mohong	Pathargaon	Piyong	Lathao-1	New Lathao	Sulungtoo	Kherem	Marua camp	Mankao	New Mohong	Manphaiseng	Manmow	Wagon pathar	Jenglai	Wengko
Aegle marmelos (L.) Corrêa	0	4.48	0	0	0	0	0	0	0	0	0	0	0	0	6.79
Aesculus assamica Griff.	2.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ailanthus integrifolia Lam.	0	0	7.83	0	0	0	0	0	0	0	0	0	0	0	0
Alangium chinense (Lour.) Harms.	0	0	0	0	0	0	0	0	0	4.64	0	0	0	0	0
Albizia arunchalensis Sahni & H.B.Naithani	0	0	0	0	0	0	0	0	0	0	15.32	0	0	0	7.32
Albizia chinensis (Osbeck) Merr.	10.09	0	0	0	0	0	0	0	0	0	7.38	0	6.45	0	0
Albizia lebbeck (L.) Benth.	4.88	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Albizia lucidior (Steud.) Nielson.	16.69	8.23	3.34	5.46	5.06	8.29	10.78	7.88	3.32	12.89	12.2	5.77	18.9	9.52	0
Alstonia scholaris (L.) R.Br	12.08	0	7.32	0	5.32	8.58	8.11	0	3.68	0	0	0	0	10.8 3	0
Annona squamosa L.	0	6.2	0	0	0	0	0	0	0	0	0	0	0	0	0
Aporosa octandra (Roxb) Muell	4.42	0	0	0	0	0	0	0	0	2.46	0	0	0	0	0
Aquilaria malaccensis	0	0	5.79	16.77	8.31	6.89	11.2	2.43	3.1	3.72	0	10.6 5	0	4.11	0
Areca catechu L.	15.43	13.85	13.6	14.51	10.7	13.42	18.63	11.38	11.19	16.03	12.38	18.3 1	14.3 9	19.7 5	20.7 1
Artocarpus heterophyllus Lam.	9.67	12.33	9.8	9.32	8.22	9.94	6.03	5.73	7.92	10.78	9.9	13.4 9	10.0 6	12.2 2	15.7 6
Artocarpus lacucha Buch-Ham.	0	0	0	0	0	0	0	0	0	6.81	0	14.3 6	0	0	0
Averrhoa carambola L.	2.77	0	0	0	0	0	2.64	2.48	1.91	2.86	0	0	8.24	0	0
Azadirachta indica A..Juss.	14.47	8.46	5.82	8.29	4.49	7.26	7.03	9.63	11.44	12.49	7.32	0	0	8.45	0
Baccaurea motleyana Müll.Arg.	1.77	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baccaurea ramiflora Lour.	0	5.46	0	0	0	0	5.19	5.19	6.27	0	0	0	0	0	0
Balakata baccata (Roxb.) Esser	0	0	6.87	0	0	0	0	0	0	0	0	0	0	0	0
Bambusa balcooa Roxb.	0	12.14	0	0	0	0	0	0	0	19.83	0	0	0	0	0
Bambusa nutans Munro.	0	0	0	0	5.43	9.26	6.74	15	5.48	0	0	0	0	8.93	0

Bambusa tulda Roxb.	11.4	9.3	8.82	15.99	17.97	17.68	16.29	21.34	23.3	10.19	16.56	23.98	23.49	9.4	18.1
Bambusa vulgaris	0	0	7.72	0	0	0	0	0	0	0	0	0	0	0	0
Bauhinia variegata (L.) Benth.	0	0	0	7.21	8.23	2.64	5.4	3.86	8.27	0	0	3.45	0	2.95	0
Bischofia javanica Blume	2.63	6.13	8.62	0	0	3.38	8.37	8.9	8.32	3.21	3.52	7.95	0	0	0
Bombax ceiba L.	3.32	6.81	3.71	12.09	5.31	8.06	3.84	3.86	10.32	2.54		11.46	16.15	5.69	10.17
Carallia brachiata (Lour.) Merr.	0	0	0	10.83	0	0	0	0	0	0	0	0	0	0	0
*Carica papaya*L.	11.05	6.17	4.53	7.52	3.38	11.75	4.96	11.06	7.55	0	10.16	6.06	11.51	8.77	0
Caryota urens L.	0	0	2.32	3.84	3.3	2.64	2.39	9.11	6.09	0	5.2		9.07	9.33	0
Cascabella thevetia (L.) Lippold	1.7	4.53	3.71	3.46	2.65	2.08	1.93	1.78	2.97	2.15	0	0	0	2.43	0
Cedrus deodara	0	0	2.39	0	0	0	5.28	0	3.66	0	0	0	0	0	0
Chukrasia tabularis A. Juss.	0	0	0	0	10.27	0	0	0	0	0	0	0	0	0	0
Cinnamomum tamala (Buch.-Ham.) T.Nees & C.H.Eberm.	3.38	0	5.32	0	10.28	3.05	0	0	0	0	9.28	0	0	0	0
Cinnamomum zeylenicum Br.	0	0	0	0	2.91	0	0	0	0	0	0	0	0	0	0
Citrus grandis (L.) Osbeck	9.84	5.14	4.97	8.27	3.66	4.55	2.65	4.99	6.84	0	0	0	0	6.86	0
Cocos nucifera L.	13.15	12.63	12.21	11.53	11.9	9.37	10.59	8.65	5.11	9.83	8.99	19.91	14.11	10.43	11.38
Cordia dichotoma G.Forst.	0	0	0	0	0	0	6.36		0	0	0	0	0	0	0
Croton roxburghii Bolar.	0	0	0	0	0	0	4.3	3.61	0	0	0	0	0	0	0
Dalbergia sissoo Roxb.	0	0	0	0	0	0	0			0		16.55		0	0
Delonix regia (Boj. ex Hook.) Raf	2.38	2.01	4.28	0	0	0	3.85	5.6	3.61	3.22	5.99	5	8.72		
Dendrocalamus giganteus Munro	0	0	0	0	0	0	0	16.79		0	0	0	0	0	0
Dillenia indica L.	0	15.35	3.75	10.76	11.15	4.63	4.17	6.38	3.75	0	8.38	11	6.44	11.27	22.16
Diospyros kaki L. F	0	0	0	0	0	0	0	5.03	0	0	0	0	0	0	0
Duabanga grandiflora (Roxb. ex DC) Walpers	4.58	0	0	11.64	10.57	4.54	4.3	5.18	7.83	0	0	4.12	0	5.13	0
Elaeis guineensis Jacq.	0	0	0	3.48	2.81	7.15	4.05	1.86	3.2	2.88	0	0	7.27	5.18	0
Elaeocarpus floribundus Blume.	2.56	0	5.53	0	0	0	0	0	2.93	7.02	0	0	0	0	0
Elaeocarpus serratus L.	0	4.79	0	4.87	9.23	7.6	5.14	4.53	0	0	0	0	0	6.62	6.7
Erythrina variegata L.	2.55	5.24	2.72	12.22	4.23	3.24	6.12	5.6	5.26	7.12	6.66	14.5	0	8.22	7.99

												4			
Eucalyptus globulus Labill.	0	0	0	0	0	0	0	0	0	0	6.24	0	0	0	0
Ficus auriculata Lour.	0	0	0	0	0	2.44	0	0	0	0	0	0	0	0	0
Ficus hispidaL.f.	0	5.99	0	0	0	3.36	3.27	0	10.94	10.79	6.65	0	0	0	0
Ficus religiosa L.	9.31	0	0	0	0	0	0	0	0	6.81	0	0	0	0	0
Garcinia cowa Roxb.	0	0	6.52	0	0	0	0	0	0	0	0	0	0	0	0
Garcinia pendunculata Roxb. ex Buch. Ham	0	3.18	0	0	0	0	0	0	0	0	0	2.8	0	0	0
Gmelina arborea Roxb.	0	0	9.14	0	0	0	0	0	0	0	4.66	5.64	0	0	0
Grewia disperma L.	4.42	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gynocardia odorata R.Br.	0	0	0	0	0	0	0	0	5.6	0	0	0	0	0	0
Heteropanax fragrans Roxb.	0	0	0	0	0	0	0	0	0	0	0	5.86	0	0	0
Hydnocarpas kurzii (King) Warb	0	0	0	0	0	0	0	0	0	5.79	0	0	0	0	0
Lagestroemia speciosa (L.) Pers.	11.39	7.7	6.1	9.63	8.54	5.78	5.54	8.67	8.29	12.43	12.75	0	13.2 1	0	0
Lannea coromandelica (Houtt.) Merr.	7.59	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Litchi sinensis J. Gmelin	2.09	4.59	2.33	3.89	3.54	6.4	5	9.68	4.26	0	5.28	0	0	3.1	0
Litsea cubeba (Lour). Pers.	0	0	0	0	0	0	0	0	0	0	6.52	0	0	0	0
Litsea gluctinosa (Lour). C.B. Rob	0	5.69	2.66	0	0	0	0	5.78	5.37	0	2.98	0	9.09	0	0
Litsea monopelata Roxb.	0	0	0	0	0	0	0	0	0	0	0	0	8.97	0	0
Livistona jenkinsiana Griff.	13.16	9.56	11.31	14.89	13.18	11.81	13.95	8.32	8.22	11.62	11.75	20.4 9	9.2	20.8 9	13.7 4
Magnolia hodgsonii (Hook.f. & Thomson) H.Keng	0	0	8.28	0	0	0	0	0	0	0	0	0	0	0	0
Mallotus paniculatus (Lam.) Mull.Arg.	0	0	3.56	0	0	0	2.31	3.51	3.42	0	0	0	7.05	0	0
Mallotus tetracoccus (Roxb.), Kurz.	8.28	7.83	0	0	0	0	0		0	0	0	8.91	0	0	0
Mangifera indica L.	19.04	11.37	12.26	14.52	15.02	11.25	7.88	10.17	9.53	7.15	12.11	15.9 1		18.5 9	20.2 9
Mangifera sylvetica L	0	0	0	0	0	0	0	0	0	0	4.54	0	0	0	0
Melia azedirach L.	9.14	3.62	0	0	0	0	0	0	2.01	2.84	4.36	8.88	2.49	0	0
Melia composita Willd.	0	0	8.87	0	0	0	0	0	0	0	6.15	0	5.22	0	0
Mesua ferrea L.	0	6.1	4.1	8.24	5.99	7.6	7.23	4.65	0	6.34	0	0	0	10.6 8	7.28

Mimusops elengi L.	0	0	5.77	0	0	0	0	0	0	0	0	6.47	0	0	0
Moringa oleifera Lam.	2.23	0	0	0	0	4.79	4.3	0	0	0	0	0	0	0	0
Morus laevigata (L.)	3.64	0	9.14	0	0	0	0	0	0	0	0	0	0	0	0
Morus nigra L.	0	0	0	0	0	0	0	0	0	3.27	0	0	0	0	2.55
Musa acuminata Colla.	0	0	0	0	0	0	0	0	0	0	2.34	0	0	0	0
Musa balbisiana Colla.	8.24	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Musa cavendish Lamb.	6.06	0	0	0	6.42	6.5	7.33	6.57	5.07	6.17		13.1	6.54	13.7 7	0
Musa paradisiaca L.	0	0	0	0	0	0	0	0	0	0	5.87	0	0	0	0
Myrica esculenta Ham.	0	0	0	0	0	0	0	0	0	2.62	0	0	0	0	0
Neolamarckia cadamba (Roxb.) Bosser	0	3.19	0	0	0	0	0	0	0	4.59	5.52	0	0	0	5.87
Nyctanthes arbor-tristis L.	0	1.87	1.92	0	0	2.47	3.94	0	3.07	4.65	0	0	0	0	0
Oroxylum indicum (L.) Benth. Ex Kurz	2.12	0	0	11.63	8.91	5.58	2.64	6.21	26.42	0	0	0	0	3.35	0
Phoebe attenuata Nees.	0	0	0	0	0	0	0	0	0	10.54	0	0	0	0	0
Phoenix dactylifera L.	0	3.19	5.61	0	0	0	0	0	0	0	0	0	0	0	0
Phyllanthus embilica L.	0	6.97	4.73	7.93	3.62	10.2	2.7	0	0	3.89	8.21	0	10.3 1	7.4	9.94
Phyllantus acidus (L.) Skeels.	2.76	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plumeria obusta L.	0	0	0	0	0	0	2.06	0	1.6	0	0	0	0	0	0
Polyalthia longifolia (Sonn.) Thwaites	0	0	0	0	0	0	0	0	0	0	6.15	0	8.32	0	0
*Premna benghalensis*C.B.Clarke	4.45	0	3.34	0	0	0	0	0	0	0	0	0	9.21	0	11.9 2
Premna latifolia Roxb.	0	0	0	0	0	0	0	0	0	0	4.56	0	0	0	0
Prunus domestica L.	0	2.99	0	0	0	5.51	4.13	4.08	2.46	0	0	0	0	3.25	7.11
Prunus persica(L.) Batsch	2.43	0	2.81	6.38	10.29	3.26	6.18	2.66	4.92	0	0	0	0	7.11	0
Psidium guajava L.	5.2	6.57	4.72	4.83	9.07	6.28	4.64	4.94	5.56	8.72	10.76	10.1 7	0	9.49	9.96
Pyrus pyrifolia (Burm.) Nak.	7.33	4.61	0	0	0	0	6.59	1.82	0	4.57	0	7.8	0	0	14.2 2
Sapindus mukorossi Gaertn.	2.31	3.38	5.93	9.24	7.41	10.17	4.24		4.5	0	8.52	0	0	3.52	0
Saraca asoca (Roxb.) Willd	0	0	0	0	0	0	2.24	2.88	0	0	0	0	6.28	0	0

Spondias pinnata (L.f.) Kurz	0	6.63	0	0	0	0	0	0	0	0	0	2.99	0	0	4.71
Sterculia villosa Roxb	0	9.54	8.12		3.82	3.18	2.86	5.26	4.43	4.51	9.75	0	0	3.24	0
	0										0	0	19.8		0
Stereospermum chelenoides DC.		5.47	8.64	7.88	6.59	5.1	8.31	5.29		11.94			9	6.44	
Syzygium cumini (L.) Skeels.	0	6.6	6.81	0	0	0	0	0	0	3.88	0	0	11.8	0	0
	0	0	0								0	0	0	10.0	0
Syzygium jambos (L.) Alston				7.64	6.84	2.79		2.39	5.63					8	
Talauma hodgsonii Hk. f. &	0	0	0	0	0	0	0	0	0		0	0	0	0	12.2
Thomson										2.65					1
Tamarindus indica L.	0	0	0	0	0	0	0	0	0		3.21	0	9.31	0	0
Tectona grandis Linn.	0	3.38	0		0	0	0	0	0	2.84	0	2.36	0	0	0
	0		0	0			0	0	0		0	0		0	17.6
Terminalia arjuna Roxb.		10.73			5.38	4.33				9.81			5.39		9
Terminalia chebula Retz.	0	2.86	8.94	5.78	14.43	6.42	3.4	4.37	5.8	6.28	4.85	0	0	9	4.56
Terminalia myriocarpa Heurck and	0			0	0					0	0			0	0
Mull. Arg.		5.3	7.42			10.29	4.15	5.37	3.97			3.96	0		
	0	0	0	0	0	0	0	0	0	0		0	0	0	17.9
Trema orientalis (L.) Blume											4.48				8
Vitex peduncularis f. Roxb.(C.B.	0	0	0		0	0	0	0	0		0	0	0	0	
Clarke) Molden				4.88						3.43					12.8
Zizyphus mauritiana Lam.	0	0	0	0	0	5.23	0	0	0	0	0	0	0	0	0
Zizyphus oenopila (L) Mill	5.6	1.84	0	4.58	5.57	3.26	5.12	5.92	6	4.42	4.48		4.61	4	0
Pyrus pyriflora (Burm.) Nak.	0	0	0	0	0	0	3.65	0	0	0	0	3.06	0	0	0

Table 4. Importance value index of homesteads Shrub and woody climber species in 15 Khampti villages of Namsai district, Arunachal Pradesh, India

Shrub species in homesteads	Old Mohong	Pathargaon	Piyong	Lathao-1	New Lathao	Sulungtoo	Kherem	Marua camp	Mankao	New Mohong	Manphaiseng	Manmow	Wagon pathar	Jenglai	Wengko
Acacia fernasiana L.	27.61	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Adhatoda zeylanica Medic.	0	15.03	0	0	0	0	0	0	0	0	0	0	0	0	0
Alangium chinense (Lour.) Harms.	0	0	0	0	0	0	0	0	0	0	0	0	30.29	0	0
Allamanda cathartica L.	0	16.84	0	0	0	0	0	0	0	0	0	0	0	0	0
Bougainvillea glabra Choisy	0	0	32.99	0	0	0	0	0	0	0	0	0	0	0	0
Bougainvillea spectabilis L.	0	31.31		26.84	8.16	10.36	12.15	0	0	0	0	0	0	9.54	0
Buddleja asiatica Lour.	0	0	9.37	0	0	0	0	0	0	0	0	0	0	0	0
Caesalpinia bonduc (L) Roxb.	0	0	34.78	0	0	0	0	0	0	0	0	0	0	0	0
Calamus tenuis Roxb.	0	16.43	0	0	0	8.07	10.09	0	0	0	0	0	0	0	22.87
Calotropis procera Br.	0	0	0	79.66	0	0	0	0	0	0	0	0	0	0	0
Camellia sinensis (L.) Kuntze	8.3	11.01	21.35	0	11.84	25.46	29.47	0	13.37	0	35.95	0	0	43.4	0
Citrus limetta Risso	0	0	16.49	0	0	0	0	0	0	0	0	0	0	0	0
Citrus limon (L.) Osbeck	42.12	39.16	32	23.23	23.27	25.98	19.69	50.04	31.32	36.8		80.78	13.18	24.3	71.12
Citrus maxima (Burm) Meer	0	0	0	0	0	0	0	0	0	66.85	43.5	0	31.61	0	10.75
Citrus medica L	0	0	0	0	0	0	0	0	0	43.98	0	0	41.9	0	0
Citrus reticulata Blanco	0	0	0	0	11.09	0	0	0	0	0	0	0	0	0	0
Citrus x sinensis (L.) Osbeck	24.91	44.9	23.1	27.83	16.55	19.12	10.98	55.13	50.18	0	0	97.13	0	53.39	0
Clerodendron colebrookianum Walp .	30.75	0	0	0	18	0	0	0	32.33	0	0	0	0	0	0
Clerodendrum grandulosum (L.)	0	37.35	0	0	0	0	0	0	0	0	38.46	0	0	0	0
Clerodendrum indicum (L.) Kuntze	0	0	0	0	31.23	0	0	0	0	0	0	0	0	0	0
Clerodendrum infortunatum L.	0	0	0	0	16.68	0	0	0	0	0	0	0	0	0	0
Clerodendrum thomsoniae Balf.f.	0	0	0	0	0	0	0	0	0	0	0	11.94	0	0	0

Clerodendrum viscosum Vent.	15.31	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Codiaeum variegatum (L.) Rumph. ex A.Juss.	24.55	12.24	14.13	33.96	8.71	15.71	18.13	33.71	20.97	12.3	0	0	22.12	23.26	0
Croton tiglium L.	0	0	0	0	0	0	25.43	0	0	0	0	0	0	0	0
Derris elliptica (Wall.)Benth.	40.92	15.34	0	0	0	0	0	0	0	0	0	0	0	0	0
Dracena fragrans (L.) Ker Gawl.	0	0	0	0	0	0	0	59.28	0	0	0	0	0	0	0
Duranta repens Linn.	0	0	0	0	0	0	0	47.48	0	0	0	0	0	0	0
Euphorbia pulcherrima Willd. ex Klotzsch.	0	0	0	0	0	26.68	0	0	0	0	0	0	0	0	9.97
Euphorbia cotinifolia L	0	0	12.38	0	0	28.94	0	0	0	0	0	0	0	0	0
Flemingia strobilifera (L.) W.T.Aiton	0	0	0	0	0	6.83	0	0	0	0	0	0	0	0	0
Garcinia lanciefolia Roxb.	0	0	0	0	10.05	0	0	0	0	0	0	13.2	0	0	0
Gardenia jasminoides J. Ellis	21.73	0	0	22.82	19.84	9.3	23.89	23.31	40.53	24.32	0	0	0	8.69	0
Gaultheria fragrantissima Wall.	0	0	0	0	0	7.01	0	0	0	0	0	0	0	0	0
Glyscosmis pentaphylla (Retz.) DC	0	0	0	0	0	0	0	0	10.28	0	0	0	0	0	0
Grewia asiatica L.	0	0	0	0	0	0	0	0	0	0	0	0	7.24	0	0
Hibiscus rosa-chinensis L.	12.41	39.07	0	0	24.36	33.86	18.01	12.38	40.21	0	40.21	0	22.39	17.99	66.62
Hibiscus syriacus L.	0	0	0	0	0	0	0	0	8.48	0	0	0	0	0	0
Holmskioldia sanguinea Retz.	0	0	0	0	0	0	0	0	0	23.93	0	0	0	0	0
Ixora chinensis Lam.	0	0	0	0	0	0	0	0	0	24.09	0	0	0	0	0
Justicia gendarussa Burm.f.	0	0	11.4	0	0	0	0	0	0	24.15	0	0	0	0	0
Lawsonia inermis L.	0	0	0	0	9.26	17.65	27.91	0	0	0	0	0	0	17.02	0
Manihot esculenta Crantz.	0	0	0	0	0	0	0	0	0	0	32.19	0	0	0	0
Melastoma malabathricum L.	0	0	0	0	0	0	0	0	0	0	14.11	0	0	0	0
Muehlenbeckia platyclada (F.Muell.) Meisn.	0	0	0	8.93	0	0	0	0	0	0	26.34	0	0	0	0
Murraya koenigii (L.) Sprenge	9.44	10.26	42.65	0	19.74	12.39	69.38	0	0	0	0	0	0	11.14	0
Murraya paniculata (L.) Jack	0	0	0	0	0	0	0	0	0	0	0	37.2	0	0	0
Nerium indicum Mill.	0	0	0	0	0	0	0	0	0	0	13.88	0	0	0	0
Nerium oleander L.	0	0	0	12.67	0	0	0	0	16.89	0	0	0	0	0	0
Passiflora quadrangularis. L.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32.28

Phlogacanthus thyrsiflorus Nees.	9.35	11.34	11.49	21.25	19.68	6.96	19.43	9.98	0	14.26	0	42.36	0	18.1	24.22
Phlogacanthus tubiflorus Nees	0	0	0	0	0	0	0	0	0	13.1	0	0	0	0	0
Phlogacanthus thyrsiformis (Roxb.) Nees	0	0	0	0	0	0	0	0	0	0	33.12	0	25.78	0	0
Picrasma javanica Bl	0	0	0	0	17.98	0	0	0	0	0	0	0	0	0	0
Piper betle L.	6.88	0	16.57	0	0	0	0	0	0	0	0	14.11	0	0	12.35
Polyalthia longifolia (Sonn.) Thwaites	0	0	0	0	0	0	0	0	0	0	22.15	0	20.32	0	0
Prunica granatum L.	0	0	0	25.44	33.65	28.45	15.44	0	0	0	0	0	0	73.17	0
Pyrus communis L.	0	0	0	0	0	0	0	0	35.44	0	0	0	12.76	0	0
Quisqualis indica L.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16.57
Ricinus communis L.	14.3	0	0	17.37	0	0	0	0	0	0	0	0	0	0	0
Rosa chinensis L.	0	0	8.7	0	0	0	0	0	0	16.22	0	0	0	0	0
Rosa indica L.	11.43	0	0	0	0	17.23	0	0	0	0	0	0	0	0	33.25
Sesbania grandiflora (L.) Poir.	0	0	0	0	0	0	0	0	0	0	0	0	12.06	0	0
Sarcochlamys pulcherrima Gaudich.	0	0	0	0	0	0	0	0	0	0	0	0	6.88	0	0
Stephania japonica Miers.	0	0	12.6	0	0	0	0	0	0	0	0	0	13.83	0	0
Tabernaemontana divaricata L.	0	0	0	0	0	0	0	0	0	0	0	0	15.96	0	0
Trevesia palmata (Roxb. ex Lindl.) Vis.	0	0	0	0	0	0	0	0	0	0	0	0	16.28	0	0
Zanthoxylum acanthopodium DC	0	0	0	0	0	0	0	8.69	0	0	0	0	7.4	0	0

IVI of Shrub species

Importance value index (IVI) of shrub and climber species recorded from 15 Khampti villages of Namsai district, were presented in table 4. In Old Mohong *IVI* of *Citrus limon* (42.12) had the highest and *Camellia sinensis* (8.30) was the lowest IVI. In Pathar Gaon *Citrus x sinensis* was the highest IVI (49.61) and *Murraya koenigii* (10.26) has the lowest IVI. In Piyong village, the highest IVI value obtained for *Murraya koenigii* (42.65) and *Buddleja asiatica* (9.37) had the lowest IVI. In Lathao-I *Calotropis procera* was recorded for highest IVI (79.66) and *Muehlenbeckia platyclada* (8.93) had the lowest IVI value. In New Lathao *Prunica granatum* (49.65) had the highest IVI and *Bougainvillea spectabilis* (8.16) had the lowest IVI. In Sulungtoo *Hibiscus rosa-chinensis* showed the highest IVI (33.86) and *Phlogacanthus thyrsiflorus* (6.96) had the lowest IVI. In Kherem *Murraya koenigii* (69.38) had the highest IVI and *Calamus tenuis* had the lowest IVI (10.09). In Marua Camp, *Dracena fragrans* (59.28) got the highest IVI and *Hibiscus rosa-chinensis* (12.38) had the lowest IVI. In Mankao *Citrus x sinensis* (54.58) has the highest IVI and *Grewia asiatica* (7.24) has the lowest IVI. In New Mohong *Citrus maxima* (66.89) has the highest IVI and *Codiaeum variegatum* (12.3) had the lowest IVI. In Manphaiseng *Citrus maxima* (43.5) hadthe highest IVI and *Nerium indicum* (13.88) had the lowest IVI. In Manmow village the highest IVI was recorded for *Citrus x sinensis* (97.13) and the lowest was calculated for *Murraya paniculata* (L.) Jack (37.2). In Wagon Pathar the highest IVI was calculated for *Citrus medica* (41.9) and the lowest IVI was found for *Sarcochlamys pulcherrima* Gaudich. (6.88). In Jenglai *Prunica granatum* occupied the highest IVI (73.17) and *Gardenia jasminoides* (8.69) had the lowest IVI. In Wengko village, the highest IVI was 71.12 calculated for *Citrus limon* and the lowest IVI for *Citrus maxima* (10.75).

Species diversity, richness and similarity indices

Species Diversity and Species Richness and Similarity Index of tree species of 15 Khampti villages of Namsai are presented in the table 5, and Species Diversity and Species Richness and Similarity Index of shrub species are presented in table 6. The study revealed that the Species Diversity of tree was recorded for highest value in Mankao village (3.75) and lowest in Manmow village (3.02) (Table 5). The Species Diversity of shrub species was observed highest in Sulungtoo village and lowest in Manmow village. On the other hand, the Species Richness for tree species was seen highest in Kherem village and lowest in Wengko village. While Species richness for shrub species was seen highest in New Lathao village and lowest in Old Mohong village.

Table 5: Species Diversity and Species Richness and Similarity Index of tree species of 15 Khampti villages of Namsai

Village	Tree species		
	Species diversity H= - Σpi(lnpi)	**Species richness Da= (S-1/lnN)**	**Sorenson's Similarity Index (Ss)= 2a/2a+b+c**
Old Mohong	3.52	8.64	0.37
Pathar Gaon	3.64	9.2	0.38
Piyong	3.7	9.81	0.39
Lathao-1	3.32	7.36	0.41
New Lathao	3.49	8.73	0.42
Sulungtoo	3.27	9.21	0.44
Kherem	3.64	10.32	0.45
Marua camp	3.42	9.39	0.44
Mankao*	3.75	9.48	1
New Mohong	3.51	8.95	0.35
Manphaiseng	3.53	8.85	0.35
Manmow	3.02	5.71	0.34
Wagon Pathar	3.27	6.28	0.32
Jenglai	3.51	8.57	0.42
Wengko	3.09	5.64	0.22

* Reference area (area with the highest species diversity)

The Khampti people were also found to grow cash crops in their homesteads. These crops helped in increased in the overall economy of the community. They grow these crops in their homesteads and use fewer fertilizers and rely on organic manure. The annual and cash crops grown by the Khampti people in their homesteads are presented in the table 7.

Table 6: Species Diversity and Species Richness and Similarity Index of shrub species of 15 Khampti villages of Namsai

Village	Shrub species		
	Species diversity H= - Σpi(lnpi)	**Species richness Da= (S-1/lnN)**	**Sorenson's Similarity Index (Ss)= 2a/2a+b+c**
Old Mohong	2.15	1.28	0.34
Pathar Gaon	2.35	3.2	0.39
Piyong	2.18	3.004	0.31
Lathao-1	2.22	2.91	0.4
New Lathao	2.7	4.41	0.4
Sulungtoo*	2.65	4.5	1
Kherem	2.45	3.32	0.44
Marua camp	2.002	2.17	0.32
Mankao	2.21	2.79	0.31
New Mohong	2.34	2.81	0.18
Manphaiseng	2.01	2.52	0.14
Manmow	1.21	1.86	0.22
Wagon Pathar	2.43	2.84	0.17
Jenglai	1.52	1.73	0.42
Wengko	2.02	2.07	0.24

***Reference area (area with the highest species diversity

Table 7: List of seasonal crops growing in the traditional homesteads of Khampti villages of Namsai district.

Annual & cash crop	**Kharif season** (April and May)	**Rabi season** (September and October)
Colocasia esculenta L.	*Zea mays* L	*Phaseolus vulgaris* L.
Zingiber officinale Roscoe	*Colocasia esculenta* L.	*Brassicajuncea* (L.) Czern.
Curcuma longa L.	*Lagenaria siceraria* (Molina) Standl.	*Brassica oleracea var. capitata*
Ananas comosus (L.) Merr.	*Benincasa hispida* (Thunb.) Cogn	*Brassica oleracea var. botrytis*
	Capsicum annum L.	*Brassica nigra, Brassica napus* L.
	Cucumis sativus L.	*Solanum tuberosum* L
	Solanum melongena L.	*Sesamum indicum* L.
	Solanum myriancanthum	*Raphanus sativus* (L.) Domin
	Cucurbita pepo L.	*Coriandrum sativum* L.
	Luffa cyclindrica M. Roem	*Allium cepa* L.
	Corchorus olitorius L.	*Allium sativum* L
		Lycopersicon esculenta L.

Species evenness of tree species in the 15 Khampti villages of Namsai is presented in fig 3.

Evenness graph presented in fig 3 indicates that except the tree species of Solongto and Marua camp other villages tree abundance of species almost similar at community composition.

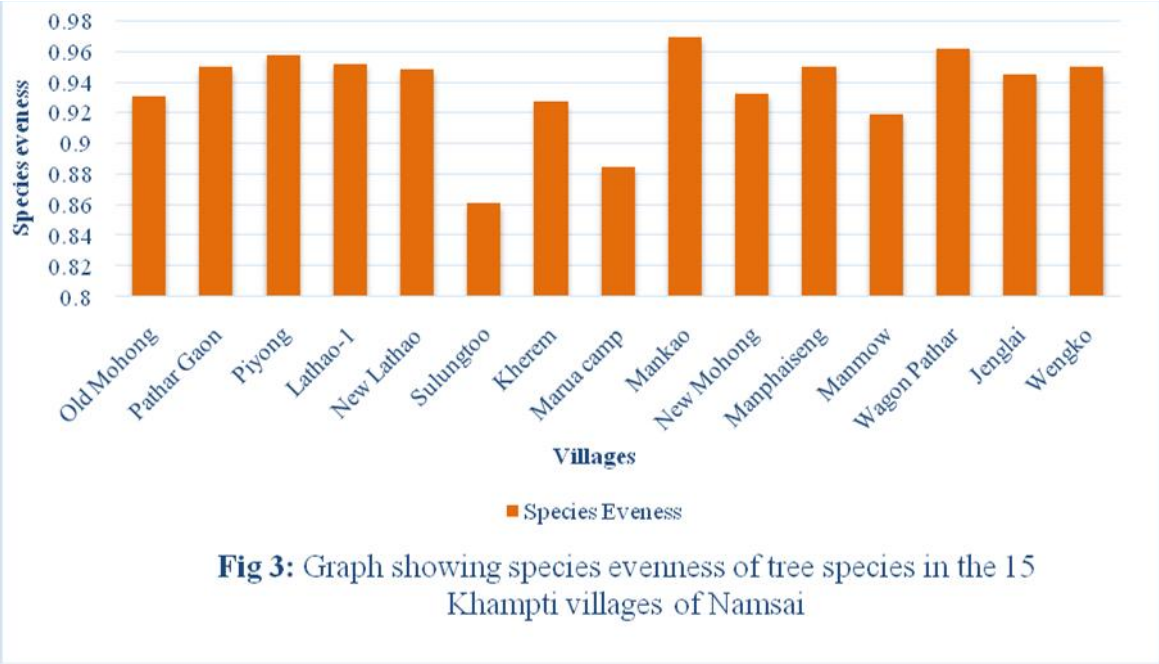

Fig 3: Graph showing species evenness of tree species in the 15 Khampti villages of Namsai

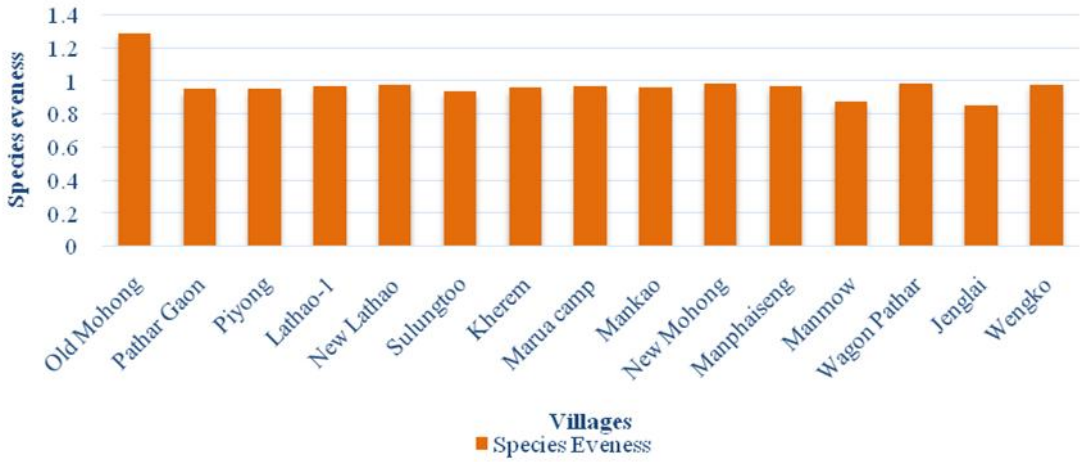

Fig 4: Graph showing species evenness of shrub species in the 15 Khampti villages of Namsai

Similarly, species evenness of shrub species in the 15 Khampti villages of Namsai presented in fig. 4 indicates that there was shrub species relative abundance in all the villages almost similar at community composition level. However, the shrub species found in Old Mohong village had different population abundance at community composition level.

Use value (UV) of the plant species

The use value of 5 tree species and 5 shrub species along with their uses among the Khampti tribe had been calculated and shown in table 8. These species were selected to find out use value because they are dominant species among the 15 homesteads. These species also have high IVI value and are economically very important. The study revealed that use value (UV) of a particular species was different in the 15 different Khampti villages. The range of UV in the table 8 referred the highest use value for *Livistona jenkinsiana* (0.65-0.71) followed by *Areca catechu* (0.58-0.63), *Bambusa tulda* (0.50-0.52), *Cinnamomum zeylenicum* (0.50-0.57), *Camellia sinensis* (0.45-0.49), *Citrus limon* (0.44-0.51), *Musa Cavendish*.(0.42-0.46), *Murraya koenigii* (0.43-0.50), *Derris elliptica* (0.39-0.42) and the lowest was observed in *Prunica granatum* (0.32-0.38).

Table 8. Use Value (UV) of most common plant species in Khampti homesteads of Namsai, Arunachal Pradesh

Species	Use value range	Part used	Ethno-botanical uses
Areca catechu L.	0.58-0.63	Fruit	The fruit is edible and part of Khampti culture and rituals
Livistona jenkinsiana Griff.	0.65-0.71	Leaves	The leaves are used for making roofs. The trees are planted as ornamental plants.
Bambusa tulda Roxb.	0.50-0.52	Culm	The culms are used as building materials, for making culinary dishes and several others.
Musa cavendish Lamb.	0.42-0.46	Fruit	The fruits are edible. The young stem is also eaten as food.
Cinnamomum zeylenicum Br.	0.50-0.57	Bark	It is consumed as both spice and medicine. It is used for respiratory, digestive and gynaecological ailments.
Camellia sinensis (L.) Kuntze	0.45-0.49	Leaves	The tea from leaves is consumed a rich source of antioxidants, vitamins and minerals.
Citrus limon (L.) Osbeck	0.44-0.51	Fruit	The fruit is edible, rich source of vitamin C. the juice is used for treatment of sore throat, fevers, rheumatism, high blood pressure etc.
Derris elliptica (wall.) Benth.	0.39-0.42	Bark	Used traditionally as an antisepsis and used against leprosy.
Murraya koenigii (L.) Sprenge	0.43-0.50	Leaves	It is a commonly used spice. The leaves are also eaten as 'chutney'. It is also used for treating piles, fresh cuts and bruises, dysentery etc.
Prunica granatum L.	0.32-0.38	Fruit	The fruit is delicious, rich in vitamins and minerals and also used for their anti-inflammatory and antibactertial properties.

Homestead plant species and lifestyle of Khampties

During the survey it was observed that Tai-Khampti has strong cultural linkage with their homestead plant species. According to the Khampti people interviewed during the survey informed that they migrated from Myanmar and settled in the Tengapani basin of Arunachal Pradesh and in Sadiya and Lakhimpur of Assam. The Khampti people are followers of Theravada Buddhism. They have their own script called Lik-tai (Tai script). They were found to traditional houses (Sang Ghar) made of bamboo and woods and has thatched roof made from leaves of *Livistona jenkinsiana*. The walls are made from spitted and knitted bamboo. Every household was observed to plant *Kaempferia galanga* in their house campus and belief that it can protect them from demon and devils.

The Khampti tribe celebrates a lot of festivals which include Sangken, POI PEE MAU (New Year festival of the Tai people, celebrated on the last day of the lunar calendar), Mai-Ka-Sung-Phai, Khao-Wa, Poat-Wa, Buddha Purnima etc. The Sangken festival is the Water Festival and the most awaited one among the Khamptis. The Khampti people are also known for their mouth-watering gracefulness. They mentioned to celebrate it on 14th April every year. On this day, after the ceremonial bath the images of Buddha are taken out for procession along with drums and music (Phukan, 2019). People splash water on each other. During this time the people use to make traditional sweets and snacks like ***khautoum*** *(sticky rice made into a roll and wrapped in leaf),* ***khautek*** *(sticky rice made into a ball and wrapped in leaf),****khaupuk*** *(sticky rice and sesame seeds) and distribute these among themselves* .Khampti men wear their distinctive full sleeved cotton shirt (**siupachai**) and the deep multi-coloured lungi (**phanoi**) while women wear half-sleeved blouse (**sui pashao**), a deep coloured skirt (**sui**) made from cotton or silk, and a coloured silk scarf. Married women wear a short green coloured cloth wrapped around the long skirt known as ***Langwat***. As part of their culture they prepare their jewellery from bamboo and birds' feathers. Bamboo even plays an important role in their dance drama *ka-pung* where flutes made from bamboo, drums and cymbals are played. Rice forms an integral part of their food habit. During household survey recorded a variety of unique food items prepared from rice for their consumption namely, ***khaumouning*** *(basic steam rice),* ***khauho*** *(steamed rice made into balls and wrapped in tong leaves),* ***khau-tongtep*** *(rice made into pancakes and wrapped in tong leaves). Another important ingredient in Khampti food in bamboo shoots. A number of food items they made with bamboo shoots, for example, are****noo phan*** *(boiled bamboo shoots with ginger),* ***nou kai noosom*** (chicken with fermented bamboo shoots), ***nou moo shen****(pork with tender bamboo shoots), and* ***nau mu phaun*** (pork with fermented bamboo shoots). Fish items include ***paasa*** **(made from raw fish and traditional spices),** ***Paa pho*** (steamed fish wrapped in tong leaves) and ***paasom****(fermented fish fried in mustard oil).* During household survey it was recorded that Khampti people offers traditionally to their species guest when visited to them a special dish with *paasaa* (a soup made from fresh raw fish and leaves of *Bischofia javanica*, *khauho* or *tupulabhat*) and *steamed* rice wrapped with leaves of *Phrynium pubinerve*) etc. The Khampti people use dried leaves of *Livistona jenkinsiana* to build roof for their houses (Nimachow et al., 2008).

Discussion

The survey was focused mainly assessment of the rich biodiversity present in the homesteads of the Khampti tribe. The on region falls under one of the 36 biodiversity hotspots of the world and the results showed the same. Considering the 15 Khmapti villages the species diversity was somewhat even in all the villages ranging from 3.02 to 3.75 (tree species) and 1.21 to 2.65 (shrub species) which depicts a stable ecosystem. The species richness has been calculated using Margalef Index where it was highest in Kherem and lowest in Wengko (tree species) and highest in New Lathao village and lowest in Old Mohong village (shrub species). The similarity index which was calculated using Sorensen Similarity index ranged between 0 and 1. Thus the villages with similarity index closer to 1 have the highest similarity with respect to the reference area. The reference area for comparing the similarity was taken on the basis of high species diversity among the 15 villages. In case of tree species Mankao had the highest species diversity and the village with the highest similarity with respect to Mankao was Kherem and the least similar village was Wengko. In case of shrub species Sulungtoo had the highest species diversity and the village with the highest similarity with respect to Sulungtoo was Kherem and the least similar village was Manphaiseng. Documentation of edible species in homesteads of Khampti villages by (Hazarika et al., 2021) reported similar findings regarding the number of trees and shrub species. Similar work regarding assessment of biodiversity in homestead gardens of Tigray, Ethiopia was done by Guyassa et al. (2013) where IVI different species found in the homesteads were studied. The comparison between the IVI of the common species found in

homesteads of Namsai revealed higher IVI in the species. This was due to the use of the species among the Khampti people. The species with higher use value was seen to be grown more in the homesteads and as a result their population had increased density, frequency and were found to be dominant.

Use value of the plant species may be important index of utility and may be a criterion of conservation of the species in their homesteads of Khampti tribes. Although the 10-plant species of Khampti homesteads of Namsai district had different UV in different villages but importance of plant species from the point of utility could be ascertained. Many researchers advocated the importance of UV as an index to quantify the relative importance of useful plants (Dossou et al., 2012). Zenderland et al., (2019) observed that UV of cultivated plants were more than that of wild plant species while studied in two ethno-botanical studies of the Republic of Georgia in the Caucasus. Dossou et al (2012) identified 28 woody plant species of Agonvè swampy forest of southern Benin and mentioned that UV may be a tool to select the species for conservation in the management plans by the local community.

The world at present is dealing with a serious problem of food crisis. A number of wild edible plant species were observed to occur in Khampti homesteads during the survey which were reported to consume as vegetable or as herbal medicine. Hazarika et al (2021a) in another study documented 106 edible plant species from Khampti homesteads, of which, 59 were cultivated and 47 were planted. The farmers of the Khampti tribe also observed to take up the daunting task of collecting and preserving the germplasm of local varieties of rice and other crops, thus ensuring food security. Khampti people also use to consume the homestead plant species like *Diplazium esculantum* (Pu kut), *Alternanthera sessilis* (Matikaduri), *Blumea balsamifera* (Yanang hak), *Centella asiatica* (Panang lung), *Calamus latifolius* (Golar), *Houttuynia cordata* (Punkyo), flower of wild banana (*Musa sp*), *Zanthoxylum acanthopodium* (Mekat) and fruits of *Elaeagnus latifolia* (Gamyamrap), *Phyllanthus emblica* (Amolodi), *Prunus persica* (Amuch), *Pyrus communis* (Semo), *Solanum nigrum* (Hor), *Zizyphus mauritiana* (Tehanghat) and *Syzygium cuminii* (Aamun) from their home gardens. Similar observation was also reported for other tribes of Arunachal Pradesh about consumption of wild edible and use to sale in the local market (Angami et al., 2006; Hazarika et al., 2021b). It was observed that Khampti people also conserved traditionally and culturally a number of plants about to extinct, wild, and other living species of a crop plant in their homesteads (Hazarika et al., 2022; Priyanka et al., 2021).

Conclusions and Recommendations

From the survey it was found that the homesteads of the Khampti people are mostly depends on homesteads plant species. Most of their homesteads accumulate all the elements required for maintaining a sustainable economy and cultural well-being. The survey also showed the presence of edible fruit bearing trees and shrubs with high use value (UV) like *Areca catechu, Artocarpus heterophylla , Citrus limon, Citrus x sinensis, Magnifera indica* L., *etc.* which help the farmers earn an income and provide ample opportunities for a better livelihood. Moreover, large trees help in wind break, provides shade and also help in preventing soil erosion. Plant species like *Mangifera indica*, *Dillenia indica*, *Phyllanthus emblica* etc. are excellent for making pickles which can offer great business opportunities for the people of the villages as a whole. The homesteads harbour thousands of flowers which is essential for making honey by the honey bees (*Apis cerara*). Production of honey bee on a commercial scale may be a promising source of income from such biodiversity rich homesteads.

The Khampti people also grow a wide variety of spices namely *Amomum subulatum, Cinnamomum zeylenicum, Coriandrum sativum, Curcuma longa, Eryngium foetidum, Murraya koenigii, Zanthoxylum armatum, Polygonum pangianum, Piper nigrum* etc which help them become self-sustained and earn an income due to their high

demand in the market. Although most of the homestead plant species were have gain conservation importance of livelihood, cultural linkage and ritual faith and traditional beliefs but needs to educate the people regarding the benefits which are not much conscious of biodiversity point. The study may be helpful to generate scientific database for improving homestead into a viable agroforestry system with ample flora and fauna to boost the economy of the homestead owner and the Khampti community as well.

Conflict of Interest

Authors do not have conflict of interest

Acknowledgments

Authors are in fact grateful to the National Mission on Himalayan Studies, G.B. Pant National Institute of Himalayan Environment and Sustainable Development, Ministry of Environment and Forests & Climate Change Govt. of India for financial support to conduct of this research work. The authors are pleasing to the Director of Rain forest Research Institute for his permission and valuable guidance. The Group Coordinator (Research) and Head, Forest Ecology and Climate Change Division, RFRI Jorhat for providing precious cooperation to carry out the works and is committed to memory.

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Quick Response Code	Website: www.ijarbs.com
	Subject: Agroforestry
DOI:10.22192/ijarbs.2023.10.01.010	

How to cite this article:
Mayur Suman, Prosanta Hazarika, Malashkiva Kotoky and Protul Hazarika. (2023). Phytosociological vis-a-vis Cultural implications of homestead plant species of Khampti tribe, Arunachal Pradesh. Int. J. Adv. Res. Biol. Sci. 10(1): 107-135.
DOI: http://dx.doi.org/10.22192/ijarbs.2023.10.01.010