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Documentation on wild vegetables of Baksa district, BTAD (Assam)

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ABSTRACT

The Baksa district, one of the 27 districts of Assam state in northeastern India under Bodoland Territorial Area Districts (BTAD) is situated on the north bank of the Brhamaputra valley. The district is mainly inhabited by the Bodo tribe along with other ethnic communities like Rabha, Garo etc. People of the area are mainly dependent on plant resources from their ambient vegetation of diverse natural habitats. The present paper records the wild plants used as a vegetable by the ethnic groups in the area. The data were collected with the help of the local people in the area having the knowledge on wild vegetables and survey of local makeshift markets.

Keywords: Wild vegetables, documentation, Baksa district, Assam

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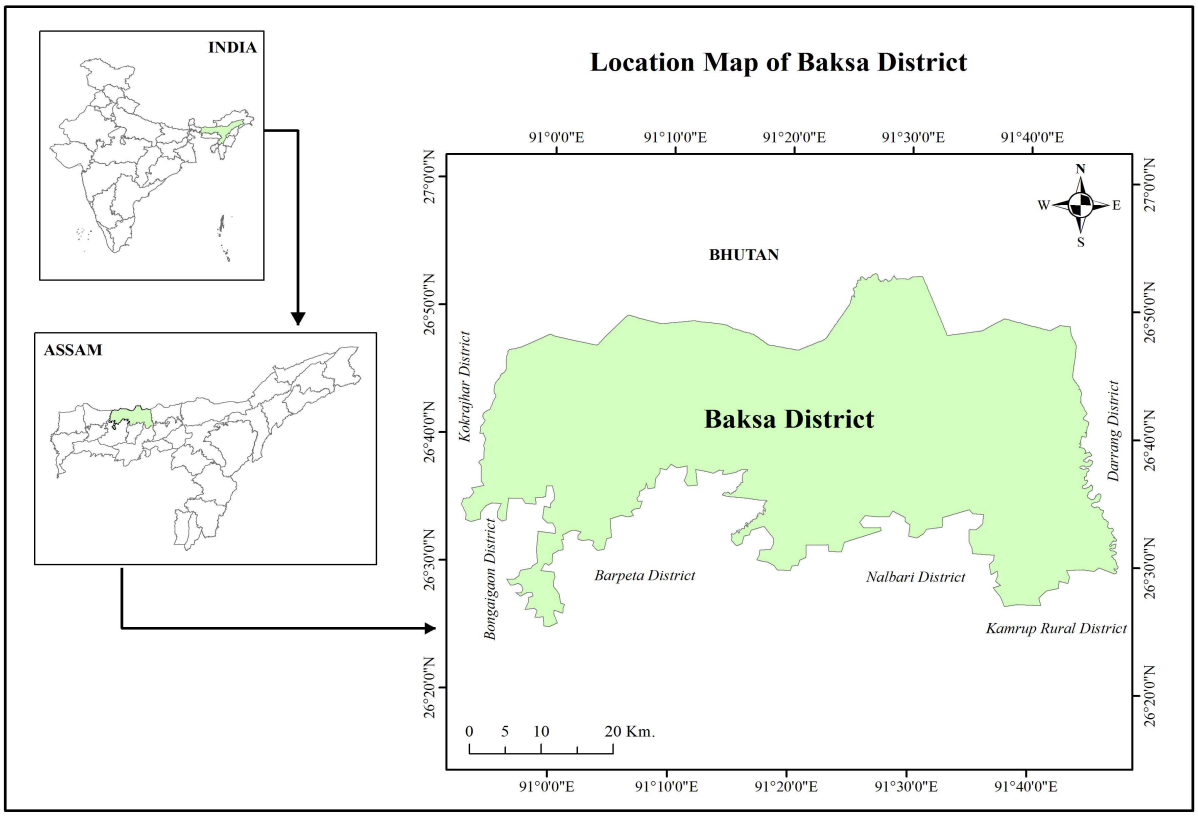
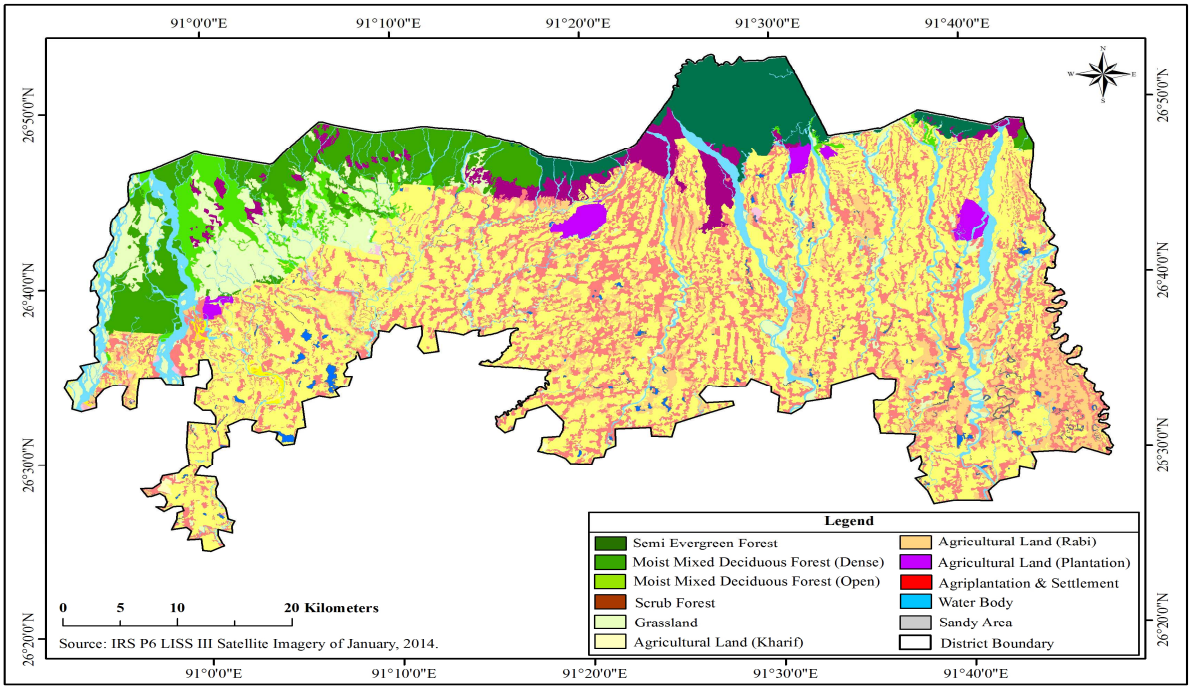
INTRODUCTION

The Baksa district is situated on the north bank of the mighty Brahmaputra and is one of the 27 districts of Assam in northeastern India. The district is under Bodoland Territorial Council and lies in between $26^0 58' 08''$ to $26^0 83' 01''$ N latitude and $91.42' 03''$ to 91.9708^0 E longitudes with a total area of 2400 sq. km. (Location map 1 & 2). The district is bounded by Bhutan in the North, Udalguri district in the East, Barpeta, Nalbari and Kamrup districts in the South and Chirang district in the West. In addition to Manas National Park (MNP) there are six Reserve Forests (RF) in the district. The grassland of MNP is the second largest in the entire North-East India [1]. The vegetation types recorded in the area consist of evergreen forest, semi evergreen forest, mixed moist deciduous forest, grassland, wetlands and riparian forest. Baksa is dominated by tribal communities like Bobo, Rabha, Garo etc. and of which Bodos are the dominant group. Wild vegetables are those plants found growing naturally in diverse wild habitats or wilderness areas which are used as dietary supplements and also play an important role in meeting the livelihood needs of the peoples living in and around these areas. Wild vegetables often serve as a substitute to staple food during scarcity. It also serves as a good source of income for many of the poor families in rural areas. A scientific investigation of wild vegetables is urgently needed to assess the potentiality of these bioresources for utilization at the time of food scarcity or crop failure. There are no works either on flora or on the ethnobotany of the area and hence the present work was initiated as part of the floristic work carried out since 2012.



Map 1: Study area



Map 2: Forest area of the Baksa district

Methods of survey

The study includes all higher plants of, including Pteridophytes, occurring wild in aquatic, marshy or semi aquatic, terrestrial habitats as well as epiphytic, parasitic in nature used as a vegetable by the ethnic groups of Baksa district, Assam. The work was undertaken during 2012-14 by exploring periodically covering all the seasons. Plant samples were collected and herbarium specimens were prepared following conventional herbarium techniques [2]. A field survey was carried with the help of the local people of the area having the knowledge on wild vegetables. During field works information were collected about the edibility of the plant, parts used and method of use along with a recording of morphological features of the plants in the field book. Local markets were surveyed for recording any wild plants sold and plant samples were collected along with the necessary information like place of harvesting, mode of uses and medicinal uses etc. The collected specimens were identified with the help of literatures [3-13]. The voucher specimens have been deposited in Gauhati University Botanical Herbarium (GUBH).

RESULTS AND DISCUSSION

During present investigation, it was found that different parts of 102 plant species (Table 1 & Plate 1) are used for various purposes, maximum utilization is of leaves and the whole plant in the preparation of herbal recipes, of which species are used for medicine. The study records a total of 102 plant species belonging to 53 families and among them 37 families belong to dicot, 13 to monocot and 3 families to pteridophyte. The total numbers of genus recorded were 86 and among them 66 genera are from dicot, 17 genera from monocot and 3 genera from pteridophyte (Table 1). The traditional knowledge of the wild edible plants is not only useful for conservation of traditional cultural practices and biodiversity, but also play a significant role in community health care system and in the development of new alternative drugs [14]. Most of the vegetables used are collected from MNP and RF and some aquatic habitats of the district. Some of the plants are consumed raw, but most are eaten cooked or fried. These plants are considered as rich sources of nutrients, vitamins and minerals and some of them are considered as having medicinal value. The edible plant parts include leaves or tender shoots, tubers, petiole, stem, flower, fruit, rhizome and root. Among these, the most commonly used edible part is leaves or tender shoot. The table below includes the wild vegetables used by different ethnic groups of Baksa district, which are arranged in alphabetically by their families to which they belong with their scientific names, family and local *Bodo* (Bd.) and *Assamese* (As.) name, part(s) used and mode of use.

Table-1: Wild vegetable plants investigated

Sl. No	Family	Scientific name	Vernacular name	Parts used	Uses
1.	Acanthaceae	*Justicia adhatoda* L.	Boga bahak / Baska tita (As.) Basigi gufur (Bd.)	Flowers	Flowers are eaten as vegetable.
		Thunbergia grandiflora (Roxb. ex Rottl.) Roxb.	Kokua lota / Kauri lota (As.) Dengkhakhlu (Bd.)	Leaves	Leaves are eaten cooked as vegetable.
		Phlogocanthus thrysiformis (Hardow.) Mabb.	Ronga Bahak / Titaphul (As.) Basigi bibar (Bd.)	flower	Flowers are eaten as vegetable, either fried or with pounded rice or gram.
2.	Acoraceae	*Acoras calamus* L.	Boch laifang (Bd.)	Leaves	Fresh leaves to flavor cooked items.
3.	Alismataceae	*Sagittaria sagittifolia* L.	Thaso Laojeng (Bd.)	Tuber/ young leaf	Young leaves and tuber are edible.
4.	Amaranthaceae	*Alternanthera philoxeroides* (Mart.) Griseb.	Menmeni (As.) Dwi-galdeb (Bd.)	Tender shoot	Cooked as leafy vegetable.
		Alternanthera sessilis (L.) R.Br. ex DC.	Ha-galdeb (Bd.)	Tender shoot	Eaten as leafy vegetable.
		Amaranthus spinosus L.	Kuduna geder (Bd.)	Young shoot/ Leaves	Tender shoots and leaves are eaten cooked.
		Amaranthus viridis L.	Kuduna jibri (Bd.)	Young shoot/ Leaves	Tender shoots and leaves are eaten cooked.
		Chenopodium ambrosioides L.	Jilmil Sak (As.)	Young shoot/ Leaves	Young leaves and shoots are eaten cooked as vegetable.
5.	Apiaceae	*Eryngium foetidum* L.	Man dhania (Bd.)	Leaves	This aromatic herb is used to increase taste in various curry.
		Centella asiatica (L.) Urb.	Bor manimuni (As.)	Leaves and	Leaves, young shoots are

			Manimuni gederjar (Bd.)	stem	eaten as vegetable. It is considered medicinal in stomach complains.
6.	Araceae	*Alocasia acuminata* Schott	Kochu (As.) Thaso Gwswm (Bd.)	Leaf petiole	Cooked and taken as curry.
		Alocasia indica (Lour.) Koch.	Man kachu (As.)	Young shoots and tubers	Tubers, rhizome and shoot are eaten cooked with acidic fruits.
		Alocasia odora (Lindl.) K. Koch	Dahi Kochu (As.)	Petioles	Petioles are eaten cooked.
		Amorphophallus sylvaticus (Roxb.) Kunth.	Olodor (Bd.)	Young leaves/petiole	Young leaves and petioles are eaten cooked.
		Amorphophallus paeoniifolius (Dennst.) Nicolson	Ol-kochu (As)	Young leaves/petiole	The whole plant cooked as vegetable.
		Typhonium trilobatum (L.) Schott	Syam kachu / Sam kochu (As.)	Whole plant	Leaf blade, petiole, tubers and spadix are eaten cooked as vegetable.
		Colocasia esculenta (L.) Schott	Thaso gwswm(Bd)	Young leaves/ tuber/flower	Tender leaves, tubers and flowers are eaten as vegetable.
		Lasia spinosa (L.) Thwaites	Chengmora (As.) Chibru (Bodo)	Petiole/ flower	Leaf petioles are eaten cooked as vegetable; flower spadix also used as vegetable.
7.	Araliaceae	*Hydrocotyle sibthorpioides* Lamk	Haru manimuni (As.)/Manimuni phisa jahar (Bd.)	Whole plant	Young leaves and shoots are use as vegetable and consider as medicinal value of stomach pain.
8.	Asteraceae	*Enhydra fluctuans* Lour	Alangshi (Bd.)	Leaves/Shoot	Leaves and young shoots are eaten cooked as vegetable
		Centipeda minima (L.) A. Br. & Asch.	Hansia bon (As.) Hansio bighang (Bd.)	Leaves	As vegetable or mixed vegetable.
		Bidens pilosa Hook.	Daomeoai (Bd.)	Leaves	Young leaves and shoots are used as vegetable.
		Blumea balsamifera DC.	Kaphur goch. (As.)	Leaves	It is used in food to give pleasant smell due to present of aromatic properties.
		Sonchus brachyotus DC.	Moira thiki (Bd.)	Leaves	Leaves are eaten cooked as curry.
		Spilanthes paniculata Wall. ex DC.	Jari laifang /Ushumoi (Bd.)	Leaves, young shoot and flower.	Whole plant are use as vegetable due presence of medicinal properties.
9.	Balsaminaceae	*Casearia glomerata* Roxb ex DC.	Tel bhuruki (As.) Dauphenda (Bd.)	Leaves and stem	Young shoots and leaves are eaten as vegetables.
10.	Basellaceae	*Basella alba* L. var. *rubra* (L.) Stewart.	Ronga Puroi (As.) Maifrai (Bd.)	Young shoot ,leaves and fruits	Leaves stem and fruits are used as vegetables.
11.	Bignoniaceae	*Oroxylum indicum* (L.) Vent.	Bhatghila/ Dingdinga (As.) Kharong (Bd)	Flowers	Flowers are used as vegetable, considered medicinal. The whole plant is considered medicinal for various diseases.
12.	Brassicaceae	*Rorippa indica* (L.) Hiern	Gonga mula (As.)	Stem/ Leaves	Young plant is used as vegetable.
13.	Carryophyllaceae	*Drymaria cordata* (L.) Willd. ex Schult.	Lai Jabori (As.) Jabshri (Bd.)	Leaves/ young stem	Leaves and shoots are eaten as vegetable.
		Stellaria media L.	Nabiki (Bd.)	Whole plant	Whole plant is used as vegetable.
14.	Chenopodiaceae	*Chenopodium album* L.	Buthua(Bd.)	Tender shoots	Tender shoots eaten fried.
15.	Commelinaceae	*Commelina benghalensis* L.	Kona Simolu (As.)	Young leaves and shoot	Young leaves and young shoots are eaten as

					vegetable.
16.	Clusiaceae	*Garcinia morella* (Gaetn) Desr	Thaikha pisajar (Bd.)	fruit	Use as vegetable.
		Garcinia pedunculata Roxb.	Thaikha gederjar (Bd)	fruit	Use vegetable.
17.	Convolvulaceae	*Argyreia nervosa* (Burm. f.) Bojer.	Thunthini (Bd.)	Whole plant	Eaten as leafy vegetable
		Argyreia speciosa Sweet.	Kolmou (As.) Mandia maigong (Bd.)	Young shoot and leaves	Young leaves and shoots are eaten as vegetable.
		Drymaria diandra Blume	Jatak mashi / Bih dharak (As.) Khawashang (Bd.)	Leaves	Leaves are eaten as vegetable.
		Ipomoea aquatica Forsk	Kaoasang (Bd.)	Young leaves	Leaves are used as vegetable.
		Merremia umbellata (L.) Hallier f.	Goria lota (As.)	Young shoot/ Leaves	used as vegetable and considered as medicine for relive pain.
18.	Costaceae	*Costus speciosus* (Koenig ex Retz.) Smith	Buri-tokon (Bd.)	Young shoot	Young shoots are eaten as vegetable.
19.	Cucurbitaceae	*Coccinia grandis* (L.) Voigt.	Belipoka (As.)	Fruit/ leaves	Used as vegetable.
		Solena amplexicaulis (Lam.) Gandhi	Lwnthi mwigong (Bd.)	Young leaf and shoots	Use as vegetable and as medicine for small pox.
20.	Discoreaceae	*Dioscorea alata* L.	Kath Alu (As.)	Tubers	Stem tubers and root tubers are eaten cooked as vegetable.
		Dioscorea bulbifera L.	Goch Alu. (As.)	Root	Root tubers are eaten cooked as vegetable.
21.	Dilleniaceae	*Dillenia indica* L.	Outenga (As.) thaigir (Bd.)	Fruit	Fleshy calyx eaten raw and cooked as vegetable.
		Dillenia pentagyna Roxb.	Okshi (Bd.)	Fruit	Flowers, fruits especially the fleshy calyx are eaten as vegetable.
22.	Euphorbiaceae	*Euphorbia hirta* L.	Gakhiroti bon (As.) Nashrai khoro (Bd.)	Young shoot/ Leaves	Young shoots & leaves are used as mixed vegetable.
23.	Fabaceae	*Bauhinia veriegata* L.	Kanchan, Boga Kotora (As.) Kharmang (Bd.)	Flower/ seed	Flower buds are eaten cooked seeds are also eaten by roasting.
		Tamarindus indica L.	Teteli (As.) thengkhleng-khalai (Bd.)	Fruit	Fruits are sour, eaten fresh or by drying prepare Jelly, pickles or eaten in curries & chutneys.
		Tephrosia candida (Roxb.) DC.	Jabwsri (Bd.)	Flower	Flowers are eaten as vegetable, either fried or with pounded rice or gram.
		Sesbania grandiflora (L.) Poir.	Bokphul (As.)	Flower	Flowers are eaten as vegetable, either fried or with pounded rice or gram.
24.	Hypericaceae	*Hypericum japonicum* Thunb. ex Murr	Sonapuli (Bd.)	Leaves/Stem	It is used as a mixed vegetable and also used as medicine by Bodos.
25.	Hydrocharitaceae	*Ottelia alismoides* (L.) Persoon	Panikela (Bd.)	Fruit	Taken fresh or cook.
26.	Lamiaceae	*Leucas plukenetii* (Roth.) Spreng.	Doron / Kansisa (As.) Kansingsa/durungfool(Bd.)	Young stem/Leaves	Young stem, leaves and flower buds are used as vegetable. It is highly considered as medicinal plant.
		Vitex negundo L.	Pasotia / (As.)	Leaves	Tender leaves are used as vegetable. The plant is considered highly medicinal.
		Plectranthus ternifolius D.Don	Jwglaori (Bd.)	leaves	Leaves are use as vegetable. The plant is consider medicinal.
27.	Liliaceae	*Asparagus recemous* Willd.	Satmul (As.)	Young shoot/ Tubers	Young shoots are eaten cooked or raw. Tuberous root has medicinal value
28.	Marseliaceae	*Marsilea quadrifolia* L.	Pani tengesi (As.)	Young Shoots	Young shoots are eaten as vegetable. It is a popular

					vegetable for Bodo tribe.
29.	Moraceae	*Ficus semicordata* Buch.-Ham. ex J.E. Sm	Thaikhro (Bd.)	Leaves	Leaves used as vegetable with pork, fruits are eaten
		Ficus auriculata Lour.	Hider thaikhro(Bd.)	Young shoot/ Leaves Fruits	Leaves used as vegetable with pork, fruits are eaten.
		Morus alba L.	Nuni (As.) Bongphang rakhep (Bd.)	Leaves/ Fruits	Leaves are used as vegetable and cooked with fishes. Ripe fruits are eaten fresh.
30	Musaceae	*Musa Velutina* H. Wendl & Drude	Ram thailir (Bd.)	Inflorescence/ young stem	Use as vegetables.
31.	Nyctaginaceae	*Boerhavia diffusa* L.	Purnanava (As.) Laije (Bd.)	Young leaves	Young leaves are eaten cooked as vegetable
32	Nymphaeaceae	*Nymphaea nouchali* Burm. f.	Thoblo bibar(Bd.)	Petiole & rhizome	Petiole taken as supplementary vegetables. Powdered rhizomes used in diarrhea
33	Oleaceae	*Nyctanthes arbor-tristis* L.	Sefali(Bd.)	*Flower*	Flowers are eaten as vegetable, either fried or with pounded rice or gram.
34	Oxalidaceae	*Oxalis corniculata* L.	Soru tengeshi (As.)	Leaves/ Stem	Young shoots and leaves are used as vegetable.
		Oxalis debilis H.B.K. var. *corymbosa* (DC.) Lour	Bor tenggeshi (As.)	Leaves/ Stem	Young shoots and leaves are used as vegetable.
35.	Phyllanthaceae	*Antidesma acidium* Retz.	Lapasaiko(Bd.)	Leaves	Leaves are eaten as vegetable, leaves can be preserved for later use.
36.	Poaceae	*Bambusa balcooa* Roxb.	Bhaluka bah (As.) Auwa burka (Bd.)	Young shoot	Young shoots are eaten after slicing as vegetables cooked with grinded rice and /or fish/meat.
		Bambusa tulda Roxb.	Jati bah (As.) Auwa gubwi (Bd.)	Young shoot	Young shoots are use as vegetables.
37.	Pontederiaceae	*Monochoria hastata* L.	Methuka (Bd.)	Flower	Use as vegetable.
		Monochoria vaginalis (Burm.f.) C.Presl	Methuka (Bd.)	Flower	Use as vegetable.
38.	Pteridaceae	*Pteris ensiformis* Burm.f	Dhekia sak (As.) Dingkhia mwigong (Bd.)	Young frond	Young fronds are eaten as vegetable mixing with others.
39.	Polygonaceae	*Fagopyrum cymosum* (Trevir.) Meisn.	Bon Paleng (As.) Moichunkha (Bd.)	Young shoot/ Leaves	The tender leaves and young shoots are eaten cooked as vegetable.
		Fagopyrum esculentum Moench.	Chutia Lofa / Dhemsi Sak (As.)	Young shoot/ Leaves	Young leaves and shoots are eaten as vegetable.
		Polygonum chinensis L.	Madhu-soleng. (As.)	Young shoot/ Leaves	Young shoots are eaten raw, slightly acidic. Leaves & shoots eaten cooked as vegetable with fishes.
		Polygonum plebejum R. Br.	Pani jaluk (As.)	Leaves and stem	Tender leaves with young shoots are eaten as vegetable
40.	Portulaceae	*Portulaca oleracea* L.	Malbhog Khutura / Malbhog sak (As.)	Leaves/ Stem	Tender shoots and leaves are used as vegetable mixed with other vegetables. Also used as medicine in liver problem and in Jaundice
41.	Rubiaceae	*Hedyotis diffusa* (Willd.) Roxb.	Bonjaluk (As.) Deusri Atheng (Bd.)	Leaves	Leaves are use as mixed vegetables
		Hemidesmus indicus L.	Parukia (Bd.)	Young tender leaves	Young tender leaves are cooked as Vegetable
		Oldenlandia corymbosa Roxb.	Tuntini (Bd.)	Whole plant	Whole plant is eaten

					cooked.
		Paederia foetida L.	Paduri lota / Bhedai lota (As.) khephi bendwng (Bd.)	Leaves/ tender twigs	Leaves, tender twigs are used as vegetable. It is also considered medicinal for stomach ache, gastric problem etc.
42.	Sapotaceae	*Madhuca indica* J.F.Gmel.	Mahua (As.)	Flowers	Flowers are eaten as vegetable.
43.	Rutaceae	*Murraya koenigii* (L.) Spreng.	Nwrsing(Bd.)	Leaves	Leaves are eaten cooked as vegetable.
44.	Saururaceae	*Houttuynia cordata* T hunb.	Mosondoi (As.) Maisundri (Bd.)	Leaves	Leaves are eaten raw or cooked as vegetable.
45.	Scrophulariaceae	*Bacopa monnieri* (L.) Wettst.	Thiphu/Bramhi (Bd.)	Tender shoot	Leaf and shoot as vegetable and extract taken to treat liver complain .
46.	Smilacaceae	*Smilax perfoliata* L.	Bag asura lota (As.) Sila assugur bendwng(Bd.)	Young leaf and shoot.	Use as mixed vegetable due to present of medicinal properties of skin diseases.
		Smilax macrophylla Willd.	Bag asura lota (As.) Sila aasugur gederjhar bendwng (Bd.)	Young leaf and shoot	Use as mixed vegetable due to present of medicinal properties of skin diseases.
47.	Solanaceae	*Solanum indicum* L.	Tit bhek uri / Bhekuri (As.) Khungkha-raja (Bd.)	Fruit	Fruits are eaten as vegetable. Also considered medicinal for worm infection and skin diseases.
		Solanum nigrum L.	Los kochi (As.) Ganga Thwfa (Bd.)	Leaves and fruit	Young leaves are used as mixed vegetable with others. Ripe fruits are eaten.
48.	Sphenocleaceae	*Sphenoclea zeylanica* Gaertn.	Sifung mwigong(Bd)	Leaf and Shoots	Use as vegetables.
49	Urticaceae	*Pouzolzia zeylanica* (L.)Benn. & R.Br.	Sam-louthi(Bd.)	Young stem and leaves	Use as mixed vegetable specially cooked with alkali.
50.	Verbenaceae	*Premna herbacea* Roxb.	Mathigathab/kheradapin (Bd.)	Young shoot and leaves	Use as vegetable and the whole plant is consider as medicine.
		Lippia geminata Kunth.	Ontha- bajab(Bd.)	leaves	Leaves are eaten cooked as vegetable
51.	Vitaceae	*Cissus quadrangularis* L.	Harjora (As.)	Stem	The young shoots are eaten as curries; also used as medicine in treatment of bone fracture.
		Vitis repanda (Vahl) W & A.	Dausrem (Bd.)	Leaves	Tender leaves are used as vegetable.
52.	Woodsiaceae	*Diplazium asperum* Bl.	Dhekia sak (As.) ,dingkhia (Bd.)	Tender frond	Tender frond is circinate which is eaten cooked by almost all communities.
53.	Zingiberaceae	*Kaemferia galanga* L.	Sonfwira (Bd.)	Leaves and shoot	Used as mixed vegetable.

Fig. 1—Wild vegetables sold in markets

Fig. 2—Wild vegetables sold in markets

Fig. 3—*Kaempferia galanga* L.

Fig. 4—*Premna herbacea* Roxb.

Fig. 5—*Drymaria cordata* (L.) Willd. ex Schult.

Fig. 6—*Houttuynia cordata* Thunb.

Fig. 7—*Phlogocanthus thrysiformis* (Hardow.) Mabb.

Fig. 8—*Acoras calamus* L.

Plate 1: Some important wild vegetables in the study area

CONCLUSION

In Baksa district, a large variety of wild edible plants are occurring in their natural habitats which are used for various purposes including as dietary supplements by the inhabitants of the area. Wild food plants are inexpensive, locally available and have a great socioeconomic significance because of their nutritive and medicinal values. With the change in the socioeconomic conditions of the people during recent years, some of the information has been lost and population some of the wild plant species are also decreasing due to habitat lost. Therefore, conservation of these plant species and popularization of their use are required to be addressed. However, further research is needed for working out the nutritional and medicinal values of these wild edible plants.

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