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Ethnobotanical study of Wild Edible Plants in Poba Reserved Forest, Assam, India: Multiple Functions and Implications for Conservation

Rajeswar Pegu, Jitu Gogoi, Ajit K. Tamuli and Robindra Teron*
Department of Life Science and Bioinformatics, Assam University- Diphu Campus, Diphu, Karbi Anglong, Assam, INDIA

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Abstract

Wild edible plants (WEPs) refer to species that are neither cultivated nor domesticated, but available from their natural habitat and used as sources of food. Poba reserved forest is the only repository of wild edible plants in the entire Jonai Subdivision, Dhemaji district, Assam. Inventory of wild edible plants in Poba RF and their importance to local communities are the objectives of the present study. Field study was undertaken following unstructured interview of local villagers, group discussions, household food survey and survey of local markets. A total of 122 wild edible plants belonging to 89 genera under 52 families and 2 varieties are reported in the present paper. The report also includes two fern species namely Cyclosorus extensa and Diplazium esculentum. Twenty six species have single use (i.e., dietary use) while other species has more than one uses such as medicine, animal feed and source of cash income and livelihoods. Besides providing goods and services, Poba RF forms natural barrier and protects Jonai Subdivisional Township from the eroding waters of the Laly River. Poba RF needs urgent conservation initiatives for ecological stability, human well-being and also as local heritage.

Keywords: Poba RF, wild edible plants, livelihoods, conservation.

Introduction

Wild edible plants (WEPs) refer to species that are neither cultivated nor domesticated, but available from their natural habitat and used as sources of food[1]. WEPs are gathered for food, nutrition and livelihoods by different cultures around the world. These plants are gathered from varied habitats from natural forests, agricultural fields to human disturbed areas such as roadsides and wastelands. Forest forms the most important source of wild foods for rural households and forest inhabitants. Among some indigenous people utilization of WEPs is integral component of their culture. Various studies have found wild edible plants potential source of nutrition while in many cases are more nutritious than conventionally eaten crops[2]. Besides food and nutrition, utilization of wild foods as coping strategies during scarcity is prevalent, particularly in developing countries where food insecurity is more acute. Diversity of plant foods consumed provides nutritional diversity and also food during famine or scarcity of favored foods[3,4]. Potential of WEPs in providing source of income and livelihoods in rural settings is acknowledged around the world[5-26].

Poba Reserved Forest (27°50'11"N and 95°17'45"E) is situated in Jonai Subdivision of Dhemaji District, Assam (figure-1). The Reserved Forest (RF) was created in the year 1924 and covers an area of 10,221 hectares. The forest receives annual rainfall of 3600 mm to 4000 mm; highest temperature so far recorded is 35^0 C in summer and lowest 7^0 C in winter. It is bounded by Daying Ering Wildlife Sanctuary, NH-52 and foot-hills of Arunachal Pradesh in the North, Dibru-Saikhowa National Park and the Siang, Dibang and Lohit rivers in the East, Laly river (referred as Brahmaputra downstream) in the South, and a few revenue villages to the West. Poba RF is an important elephant corridor linking the foot hills of Arunachal Pradesh and Dibru Saikhowa National Park via the proposed Kobu Chapori Reserve Forest. Fringe area of the RF is inhabited by a few ethnic groups such as Mising, Bodo, Sonowal Kachari and Hajong (Rabha). These communities are dependent on forest for habitat and other needs for well-being; the forest contributes livelihoods to many households as well. Poba RF is the only repository of wild edible plants in the entire Jonai Subdivision, Dhemaji district, Assam but its biodiversity has not been scientifically evaluated. Poba forest is under serious threats from anthropogenic activities and natural calamities particularly erosion by the Laly river. If the present trend of deforestation continues and conservation measures not initiated, it will not be long when Poba RF will be rendered to oblivion. The objective of the present investigation is to study wild food plants diversity in Poba RF used by fringe and adjoining rural communities.

Material and Methods

Poba RF and wild plant foods used by fringe and adjoining villagers are the materials of the present investigation. Field study was undertaken during October 2011 and November 2012. Information on wild edible plants (WEPs) gathered from Poba RF was documented by unstructured interview of fringe and adjoining villagers and group discussions with women elders. We also visited local markets to survey and record wild plant foods collected from the study area. Regular visits to villages were undertaken during the study period to record wild foods stored in houses. Wild edible plants were collected from

the forest with the help of local guides and the specimens were identified and made into voucher specimens as per standard methods[27]. The specimens are deposited in the Department of Life Science and Bioinformatics, Assam University, Diphu Campus for future reference.

Results and Discussion

Poba RF is the only repository of wild edible plants in the entire Jonai Subdivision, Dhemaji district, Assam and hence, indispensable to the local communities. Many households collect minor products and sell them in local markets for cash income and livelihoods. The present study documented use of 122 wild edible plants belonging to 89 genera under 52 families and 2 varieties (table-1). The report also includes two fern species namely *Cyclosorus extensa* and *Diplazium esculentum*. Twenty six species have single use (i.e., dietary use) while other species has more than one uses such as medicine and animal feed. In addition many species are source of cash income and livelihoods. Almost all parts of plants (leaves, stem, flowers, fruits, roots, tubers) are consumed. Most plants are eaten boiled while some plants are eaten after frying, baking or roasting. Wild foods collected from Poba RF also include a few weeds. Besides providing goods and services, the Poba forest forms natural barrier and protects Jonai Subdivisional Township from the eroding waters of the Laly river.

Utilization of wild edible plants (WEPs): Poba RF is the only natural repository of wild plant foods in the entire Jonai Subdivisional area. People around the forest have developed sound knowledge of wild plant foods, its collection and consumption. Local communities have positive attitudes towards WEPs as being easily accessible, safe, organically produced and dietary variety. Most of the plants are eaten boiled without addition of mustard oil and commercial spices. Delicacies are often flavored by fresh herbs in its unprocessed form. Methods of preparation vary among different ethnic groups. In one unique method, plant parts are mixed with other ingredients, wrapped with banana or turmeric leaves and then cooked by baking in hot charcoal. A few plants are eaten fried with salt and/or garlic while a good number of plants are eaten raw or after roasting over fire. Certain plants are prepared in small quantity either boiled or baked or roasted and then appreciable chili is added to make the item hot. Such delicacy is called *chutney*, a common practice when the plant is deficient in supply. In still another method of preparation of local delicacy, plants along with other ingredients are stuffed in bamboo tube and then cooked. Such item is considered revered over delicacies prepared by other methods.

Traditional knowledge of wild food plants is passed orally from parents to children through words of mouth. Children learn names of wild foods at home collected by their parents. They learn to identify the plant and parts collected by accompanying their parents to forests. Later, utilizing their experience, children collect plant foods by themselves; parents/elders correct them for any error or deficiency. Girls usually acquire knowledge of cooking from mothers and grandmothers while the males learn cooking from varied sources as their activities are more diversified and mostly outside the house. In tribal societies cooking foods is considered as exclusive occupation of females and for this, culinary knowledge is a qualification for marriage.

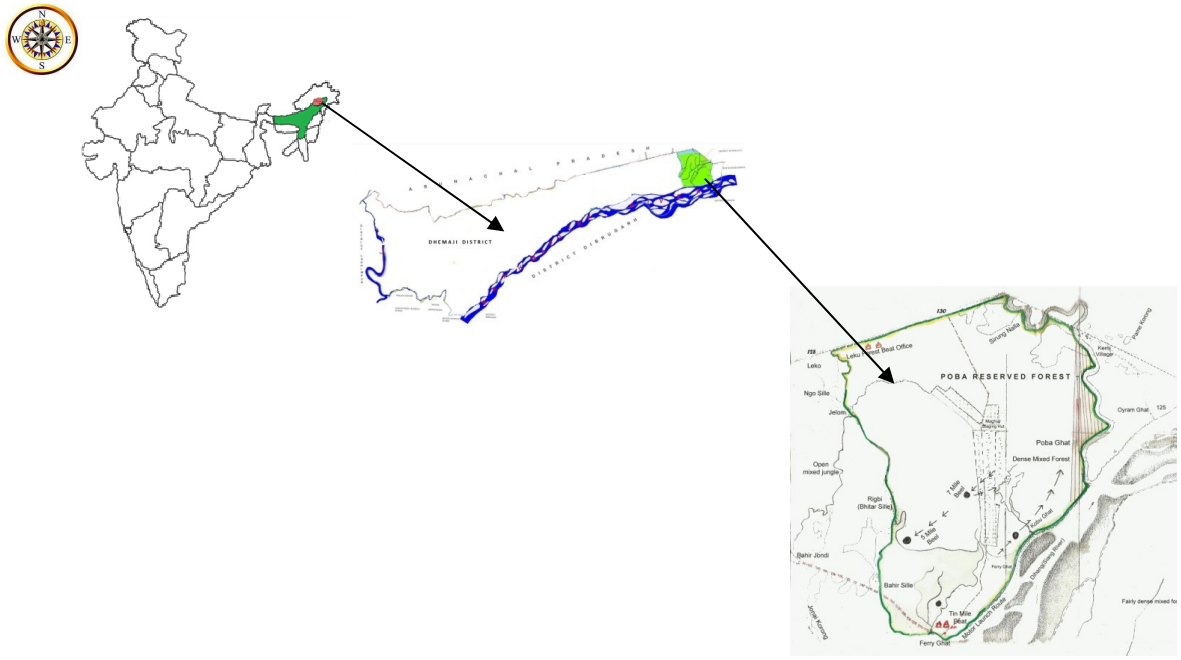

Figure-1
Map of Poba Reserved Forest, Dhemaji district, Assam

Table-1
Inventory of edible wild plants in Poba Reserved Forest, Dhemaji district, Assam, Local names in Assamese (Ass), Mising (Mis) and Bodo

Sl. No.	Botanical name and Family (in parenthesis)	Family	Local name	Parts used and Methods of preparation	Other information
1	*Albizia lucida* Benth.	Mimosaceae	*Langit* (Mis), *Moz* (Ass)	Tender leaves cooked with pork meat; bitter.	Fuel wood
2	*Alpinia allughas* Retz.	Zingiberaceae	*Tali'ng* (Mis), *Torapat* (Ass), *Thari bhillai* (Bodo)	Tender stems are eaten raw or cooked with small fish.	Leaves used by Mising people during the festival of *Ali a:ye li'gang*. Cash income.
3	*Alternanthera sessilis* (L.) R.Br.ex.D.C.	Amaranthaceae	*Patang oying* (Mis), *Matikaduri* (Ass), *Dhwgong Jile* (Bodo)	Shoots eaten boiled by Misings and eaten by Bodos after boiling or baking.	Tender shoots for liver ailment and dysentery; cash income
4	*Amaranthus caudatus* L.	Amaranthaceae	*Moricha sak* (Ass)	Tender leaves and shoots for vegetable	Weed, Cash income.
5	*Amaranthus polygonoides* L.	Amaranthaceae	*Mati khutura* (Ass)	Tender shoots eaten as curry or fried	Weed, Cash income.
6	*Amaranthus spinosus* L.	Amaranthaceae	*Hati khutura* (Ass)	Leaves and tender shoots eaten as curry or fried.	Weed, Cash income.
7	*Amaranthus tricolor* L.	Amaranthaceae	*Ronga Moricha sak* (Ass).	Young leaves and shoots cooked for curry.	Cash income.
8	*Amaranthus viridis* L.	Amaranthaceae	*Genyak* (Mis), *Kuthura sak* (Ass), *Khanthau khora* (Bodo)	Tender shoots are eaten cooked with fish.	Cash income; pig feed
9	*Anthocephalus chinensis* (Lamk.) Rich ex. Walp.	Rubiaceae	*Yi'pong Be'lang* (Mis), *Raghu*, *Kodom* (Ass)	Mildly acidic fruit either eaten raw or cooked as vegetable.	Ornamental; fuel wood; cash income
10	*Antidesma acidum* Retz.	Euphorbiaceae	*Somkong* (Mis), *Heloch* (Ass)	Ripe fruit eaten; leaves prepared for curry.	Leaf preparation in headaches; stem to stimulate menstrual flow; fuel wood; cash income
11	*Antidesma bunius* (L.) Spreng	Euphorbiaceae	*Somkong (Mis) Borheloch (Ass)*	Ripe fruits eaten; leaves eaten cooked.	Fuel wood; cash income
12	*Ardisia* sp.	Myrsinaceae	*Dokling* (Mis)	Fruits are eaten; tender shoots eaten fried.	
13	*Artocarpus chama* Buch-Ham.	Moraceae	*Sam* (Mis), *Cham kothal* (Ass)	Ripe fruits are sweet and eaten.	Fuel wood; Famine food; cash income
14	*Artocarpus lacucha* Ham.	Moraceae	*Rilang* (Mis), *Dewa chali* (Ass), *Dhawa* (bodo)	Bark chewed as betel nut by Mising woman; ripe fruit is edible.	Fuel wood, cash income
15	*Baccuarea ramifolira* Lour.	Euphorbiaceae	*Buri a:ye* (Mis) *Leteku* (Ass,Bodo)	Pulp of fruit is eaten by all community; tender shoots eaten cooked.	Bark for mouth ulcer in children. Fuel wood; Cash income
16	*Bacopa monnieri* (L.) Penn.	Scrophulariaceae	*Brahmi* (Ass)	Leaves cooked and taken as vegetable.	Whole plant for constipation, cough, fever, clearing voice and diabetes; nerve tonic. Cash income.
17	*Bischofia javanica* Blume	Euphorbiaceae	*Takki'r*(Mis), *Urium* (Ass), *Thaiso* (Bodo)	Ripe fruits sandy and sweet, eaten. Tender stem is acidic eaten raw; tender shoots eaten for vegetable by Mising	Fuel wood; stem for post in house; fruits for coloring cloths.
18	*Bombax ceiba* L.	Bombacaceae	*Singgi* (Mis), *Simolu* (Ass), *Simla* (Bodo).	Unripe fruits are eaten by Mising.	Leaves are used as hair wash; fuel wood; cash income
19	*Calamus rotang* L.	Arecaceae	*Jeying* (Mis), *Bet* (Ass), *Rideng Bijo* (Bodo)	Tender shoots boiled with fish; roasting is usually preferred.	Stem is used as cordage; cash income

20	*Callicarpa rubella* Lindl.	Verbenaceae	*Gopura* (Mis), *Bonmola* (Ass).	Bark and roots are used as substitute of betel nut and chewed with betel leaf.	
21	*Centella asiatica* (L.) Urban	Apiaceae	*Borrmanimuni* (Mis, Ass) *Gidir manimuni* (Bodo)	Aerial parts used as vegetable with small fish. Prefers as *chutney*.	For stomach complaints and liver tonic and for increasing memory. Leaf paste in wound, cuts. Cash income
22	*Chenopodium ambrosioides* L.	Chenopodiaceae	*Botua* (Mis, Bodo) *Jilmil sak* (Ass)	Shoots eaten as vegetable after boiling or fried.	Used as tonic and antispasmodic. Cash income.
23	*Cinnamomum tamala* Nees.	Lauraceae	*Tezpat* (Mis, Ass,Bodo).	Mature leaves and bark are used to flavor curries, tea, *polao*, etc; for making yeast culture.	Antimicrobial and antioxidant; used to cure diarrhea and colic pain. Cash income
24	*Citrus medica* L.	Rutaceae	*Singkin* (Mis) *Jora tenga* (Ass) *Na-reng Asi* (Bodo)	Fleshy pulp is sweet, eaten fresh; fruit juice is taken with chili by Mising and Bodo women.	Leaves traditionally used to prevent bad dreams. Cash income
25	*Clerodendrum cloebrookianum* Walp.	Verbenaceae	*Pakkom* (Mis), *Nafafu* (Ass), *Mekhuwna* (Bodo)	Leaves cooked with pork; revered delicacy.	Locally used to control high blood pressure. Cash income.
26	*Clerodendrum serratum* (L.) Moon	Verbenaceae	*Oti oyi'ng* (Mis)	Tender shoots, flowers often cooked pork and taken as curry.	Medicinal for stomach disorder or diarrhea by Mising people.
27	*Clerodendrum viscosum* Vent. (Verbenaceae)	Verbenaceae	*Doppat-tita* (Ass)	Tender leaves are eaten as vegetable; bitter.	Leaves are use in preparation of yeast culture for fermenting rice.
28	*Colocasia esculanta* (L.) Schott	Araceae	*Ange* (Mis), *Kochu* (Ass), *Thaso* (Bodo)	Tender leaves, runners and corms eaten cooked with fruits of *Dillenia indica* and dried fish. Leaves grinded with dried fish and kept in the bamboo tube for future use.	Whole plant is used as medicine to purify blood, cogulant; pig feed. Cash income
29	*Combretum roxburghii* Spreng	Combretaceae	*Latachali* (Mis, Ass)	Bark is chewed as substitute of betel nut	
30	*Commelina benghalensis* L.	Commelinaceae	*Konasimolu* (Ass)	Leaves prepared for curry or eaten fried	Paste of the plant in burns; root juice in indigestion. Juice of whole plant for sore eye**.** Cash income.
31	*Costus speciosus* (Koen.) Sm.	Zingeberaceae	Pe'ki'ji'gji'g (Mis), Jomlakuti(Ass)	Shoots as curry; stems are eaten raw.	Juice of stem for Jaundice.
32	*Cyclosorus extensa* (Blume) Ching	Thelypteridaceae	*Rukji* (Mis), *Bhilongoni* (Ass)	Leaves cooked with chicken for curry.	Tender shoots in preparation of yeast culture. Leaves used in occult practice.
33	*Dalbergia pinnata* Prain	Fabaceae	*Laleng chali* (Mis,Ass), *Amlailewa* (Bodo).	Bark is often chewed with betel leaf by Mising people.	
34	*Dendrocnide sinuata* (Blume) Chew.	Urticaceae	*Pe'ji* (Mis), *Surat pat* (Ass), *Khorma* (Bodo)	Flowers are picked carefully and cooked for vegetable by Bodo people.	Root for intestinal worms.
35	*Desmodium triquetrum* (L.) D.C.	Fabaceae	*Ulucha* (Mis,Ass).	Dried leaves used as substitute for tea by the Misings and Adis of Arunachal Pradesh.	
36	*Dillenia indica* L.	Dilleniaceae	*Sompa* (Mis), *Outenga* (Ass), *Thaigir* (Bodo)	Misings and Bodos prefer to cook the fruit with fish and pork.	Fresh fruit for diabetes. Mucilage of fruit as hair washes. Cash income.

37	*Diplazium esculentum* (Retz.) Sw.	Athyriaceae	*Okang* (Mis), *Dhekia sak* (Ass)	Tender leaves are cooked with fruit of *Dillenia indica* and fish and taken as vegetable.	Whole plant as insecticides. Decoction of rhizome for haemoptysis and cough. Cash income.
38	*Drymaria cordata* (L.) Wild.ex R and S	Carryophyllaceae	*Laijabori* (Mis Ass), *Jabshri* (Bodo).	Shoots cooked with small fish by baking and eaten by Misings.	For sinusitis and in cuts and wounds. Cash income.
39	*Eichhornia crassipes* (Mart.) Solms.	Pontederiaceae	*Meteka* (Mis,Ass)	Flowers are usually baked and eaten.	Weed, organic manure
40	*Embelia subcoriacea* (Clarke). Mez.	Myrsinaceae	*Trimeng* (Mis), *Poimuri Tenga* (Ass).	Leaves are eaten cooked as vegetable	
41	*Erechthites valerianaefolia* (Wolf.) DC.	Asteraceae	*Ogen* (Mis), *Bon kapahi* (Ass).	Tender leaves as curry flavor.	Cash income
42	*Eryngium foetidum* L.	Apiaceae	*Brahmang ori* (Mis), *Mandhania* (Ass), *Ghangar dundia* (Bodo)	Aromatic; leaves as curry flavor and also made into *chutney*.	Cash income
43	*Euphoria longan* (Lour.) Steud.	Sapindaceae	*Tegonog* (Mis) *Naga lichu, Kath lichu* (Ass)	Ripe fruits are eaten.	Fuel wood; fruits for cash income
44	*Ficus auriculata* Lour.	Moraceae	*Kukbal Takuk* (Mis) *Mondimoru* (Ass) *Ghider thaikhro* (Bodo)	Leaves cooked with pork for vegetable. Ripe fruits eaten; delicious.	Cash income
45	*Ficus hispida* L.f.	Moraceae	*Taji'g* (Mis), *Dimoru* (Ass), *Dumoru(Bodo)*	Tender leaves and shoots are eaten cooked with pork meat; ripe fruits eaten, pleasant aroma.	Fuel wood; cash income
46	*Ficus racemosa* L.	Moraceae	*Tak:piang* (Mis), *Dhumbru khausa* (Bodo)	Tender shoots and green fruits eaten cooked with pork meat.	Cash income
47	*Ficus semicordata* Buch Ham.ex Sm.	Moraceae	*Takuk* (Mis), *Thaikhro* (Bodo)	Tender leaves and shoots are eaten cooked with pork meat; ripe fruits eaten.	Cash income
48	Fragraria indica *(Andrew) Focke*	Rosaceae	*Poter aye* (Mis)	Ripe fruits are red, eaten	
49	*Garcinia lancifolia* Roxb.	Clusiaceae	*Rupohi tekera* (Mis, Ass).	Ripe fruit is eaten fresh. Tender leaves and shoots are eaten cooked by Mising	Dry fruits are used as medicine; fuel wood; fruits for cash income
50	*Garcinia cowa* Roxb .	Clusiaceae	*Kouthekera* (Mis, Ass).	Fruits are acidic, eaten. Seeds of ripe fruit eaten fresh which is sweet	Dry fruits are used in gastrointestinal problems; cash income
51	*Garcinia Morella* (Gaetn.) Desr.	Clusiaceae	*Kudi tekera* (Mis), *Kujithekera* (Ass), *Undhui thaikha* (Bodo)	Ripe fruits eaten; sour.	Fruits are sliced and dried in the sun or fire and then used in dysentery. Cash income.
52	*Garcinia pendunculata* Roxb.	Clusiaceae	*Borthekera* (Mis, Ass), *Gidir thaikha* (Bodo)	Ripe fruits eaten. Dry fruits are traditionally used in Bahag bihu by Assamese people	Dried fruits used in *Bahag Bihu* festival for bathing cattle. Dried fruits in dysentery. Cash income.
53	*Grewia hirsuta* Vahl.	Tiliaceae	*Hukta pata* (Ass)	Ripe fruits are eaten.	It is used as medicine
54	*Grewia sapida* Roxb.	Tiliaceae	*Pumi aye* (Mis) *Phuhura* (Ass)	Ripe fruits eaten by Mising people.	
55	*Hedyotis diffusa* Willd.	Rubiaceae	*Bonjaluk* (Mis, Ass)	Leaves and fruits are cooked with other plants for plants for curry.	Medicinal
56	*Hedyotis scandens* Roxb.	Rubiaceae	*Bhebeli lota* (Mis, Ass)	Leaves are eaten cooked with other plants.	Medicinal; cash income

57	*Hodgsonia macrocarpa* (Blume) Cogn.	Cucurbitaceae	*Tatar* (Mis), *Theboulata* (Ass), *Til lou* (Bodo)	Kernel of seeds eaten as *chutney*; excess consumption is said to cause gastrointestinal problem.	Empty seed coat is used as container for lime, tobacco, etc. Cash income.
58	*Houttuynia cordata* Thunb.	Saururaceae	*Mosondari* (Mis, Ass)	Leaves are eaten as *chutney* and as curry flavor.	Used in gastrointestinal problems. Cash income.
59	*Hydrocotyl sibithorpioides* Lamk.	Apiaceae	*Horumanimuni* (Mis, Ass), *Pisa manimuni* (Bodo)	Leaves cooked with small fish by Misings and taken as *chutney*.	Gastrointestinal problems, liver tonic, memory enhancer and in wounds and cuts. Cash income.
60	*Ipomoea aquatica* Forsk.	Convolvulaceae	*Kolmou* (Mis, Ass), *Mandemaigong* (Bodo).	Shoots boiled or fried for vegetable. Fruits are also eaten fried.	Pig feed; Cash income
61	*Kalanchoe pinnatum* Lamk. Pers.	Crassulaceae	*Dupor tenga* (Mis, Ass), *Pategaja* (Bodo)	Leaves are eaten as *chutney* by Mising and Bodo people.	Used for curing kidney stone and constipation.
62	*Lasia spinosa* (L.) Thw.	Araceae	*Asi Ange* (Mis), *Seng mora* (Ass)	Misings prefer to cook leaves with dried fish for curry.	Cash income; pig feed
63	*Leucas plukeneti* (Roth) Spreng	Lamiaceae	*Durun* (Mis,Ass), *kansisa (*Bodo*)*	Leaves cooked with small fish by Misings; sometimes eaten baked.	Juice of leaves for treatment of sinusitis. Cash income.
64	*Leucosceptrum canum* Sm.	Lamiaceae	*Toti* (Mis)	Fruits are eaten as vegetable.	
65	*Mackaya neesiana* Nees.	Acanthaceae	*Obul oying* (Mis).	Tender shoots and leaves are eaten as vegetable by Mising.	Cash income
66	*Mangifera sylvatica* Roxb.	Anacardiaceae	*Yumrang kedi* (Mis), *BonAm* (Ass)	Unripe fruits are aromatic; eaten in curry or *chutney* or made into pickles and jelly. Ripe fruits are sweet like common mango.	Cash income; fuel wood
67	*Melastoma malabathricum* L.	Melastometaceae	*Beyo* (Mis)	Tender leaves are eaten boiled.	Leaves used in preparation of yeast culture for rice beer. Cash income
68	*Meliosma pinnata* Roxb.	Meliosmaceae	*Dermi* (Mis) *Mamoi* (Ass)	Tender leaves eaten cooked as curry with fish and pork.	Fuel wood; leaves for cash income
69	*Meliosoma simplicifolia* (Roxb) Walp. ssp *simplicifolia*	Sabiaceae	*Gurban* (Mis), *Laidsbri* (Bodo)	Tender shoots and leaves when cooked with pork is revered delicacy of Mising and Adi people.	
70	*Momordica cochinchineusis* (Lour.) Spreng	Cucurbitaceae	*Bhat kerela*	Fruits are eaten in curry or chutney.	Domesticated, Cash income.
71	*Mukuna pruriens* (L.) D.C.	Fabaceae	*Bander kokua* (Ass)	Seeds are carefully removed from pods and eaten cooked; delicious.	Pod as medicine
72	*Musa velutina* Wendl. and Drude	Musaceae	*Doge kopak*	Inflorescence eaten boiled; sometimes as *chutney*.	Soup to control stomach disorder. Cash income
73	*Myrica esculenta* Ham. ex Don	Myricaceae	*Naga tenga* (Mis, Ass)	A refreshing summer drink is prepared from ripe fruits.	Fruits for cash income.
74	*Natsiatum herpeticum* Buch.-Ham. ex Arn.	Icacinaceae	*Target* (Mis), *Oupat* (Ass).	Tender shoots and leaves constitute the favorite delicacy of the Misings	Medicinal
75	*Nymphaea nouchali* Burm. f.	Nymphaeaceae	*Kampone aluk (*Mis*) Boga seluk (Ass).*	Petiole, fruits and roots cooked as vegetable; seeds eaten raw or eaten roasted.	
76	*Nymphaea rubra* Roxb.ex.Andrews	Nymphaeaceae	*Li'ne' Aluk* (Mis), *Ronga seluk* (Ass).	Petiole, fruits and roots eaten cooked; seeds are eaten raw or roasted Fruit and root stock eaten raw.	

77	*Oxalis coniculata* L.	Oxalidaceae	*Soru tengesi* (Mis, Ass) *Pisa Singri mekhai* (Bodo)	Tender shoots and leaves eaten cooked with small fish; said to be mildly acidic.	Whole plant for cash income
78	*Oxalis debilis* H.B.K.var. *corymbosa* (D.C.) Lour.	Oxalidaceae	*Bor tengesi* (Mis, Ass) *Gider Singri mekhai* (Bodo)	Leaves and petiole are eaten as vegetables after cooking with small fish.	
79	*Paederia scandens (*Lour) Merr.	Rubiaceae	*Bungkripuk* (Mis), *Bedhailota* (Ass)	Shoots cooked with fish and eaten as vegetable.	Used in stomach and urinal problems. Cash income.
80	*Passiflora assamica* Chakrav.	Passifloraceae	*Ne'kung* (Mis), *Naltenga* (Ass), *Dhausrem* (Bodo)	Tender shoots is cooked with small fish.	Fruits for cash income
81	*Phlogocanthus thrysiflorus* Nees.	Acanthaceae	*Kone oying* (Mis), *Dhapat tita* (Ass).	Tender inflorescence, flower are eaten as vegetable	Leaves for preparing yeast culture for producing rice beer.
82	*Phlogocanthus thrysiformis* (Hard.) Mabb.	Acanthaceae	*Titaphul* (Mis), *Titaphul, Rongabahok* (Ass).	Inflorescence eaten fried or as chutney after boiling or baking; quite bitter in taste.	Leaf and flower as anthelminthic, asthma, bronchial disorders, jaundice, diarrhea and cough**.** Wood for cash income.
83	*Phyllanthus emblica* L.	Euphorbiaceae	*Amalika* (Mis,Ass**)**	Fruits are eaten raw or made into pickles.	Whole plant used in Ayurvedic medicines. Cash income; fuel wood
84	*Phyllanthus fraternus* Webst.	Euphorbiaceae	*Mati amlokhi*, *Bhu amlokhi* (Ass)	Tender leaves, shoots along with fruits are eaten raw or cooked as vegetable.	Medicinal for stomach disorder and diabetes.
85	*Piper longum* L.	Piperaceae	*Pimpoli*, *pipoli*, (Mis,Ass), *Fanfeuwali* (Bodo)	Leaves used as a condiment in various dishes.	Used for cough, sore throat. Cash income.
86	*Piper thomsonii* Hook.f.	Piperaceae	*Angoni pan* (Mis), *Auni pan* (Ass)	Leaves eaten with betel nut substitute of betel leaf.	Used for cough, sore throat.
87	*Plectranthus ternifolius* Don.	Lamiaceae	*Mi'rne'kotung*, (Mis) *Jiglauri* (Bodo)	Pungent; tender shoots and leaves are cooked with meat by Misings for vegetable.	Juice of leaves is used for curing of dysentery. Cash income
88	*Poikilospermum suaveolens* Blume	Moraceae	*Ogi'g I ri'bi'* (Mis) *Latadimoru* (Ass).	Leaves and tender shoots are eaten cooked as vegetable	Medicinal. Bark for cordage
89	*Polygonum chinensis* L.	Polygonaceae	*Lo:rum* (Mis) *Behu* (Ass).	Tender leaves and shoots are eaten cooked, slightly acidic.	Cash income.
90	*Polygonum kawagoeanum* Makino	Polygonaceae	*Chayang marsang* (Mis)	Leaves aromatic, added to flavor dishes and also prepared for *chutney*.	Boiled juice is used to relieve body pain.
91	*Polygonum orientale* L.	Polygonaceae	*Takti'r oying* (Mis) *Bon kuhiyar* (Ass)	Tender leaves and shoots as curry.	Cash income
92	*Polygonum plebeium* Br.	Polygonaceae	*Pani jaluk* (Ass).	Tender leaves and shoots are eaten as vegetable.	Piscicide, medicinal.
93	*Prunus jenkinsii* Hk.f.andTh.	Rosaceae	*Bon thereju*, *Thereju tenga* (Ass)	Ripe fruits eaten	
94	*Pueraria phaseoloides* (Roxb.) Benth.	Fabaceae	*Pani alu* (Ass).	Tubers fleshy and tasty; often eaten raw	
95	*Pueraria thomsoni* Benth.	Fabaceae	*Mayong* (Mis), *Pani alu (Ass)*	Tuberous roots are eaten cooked.	
96	*Pueraria tuberosa* (Wild.) D.C.	Fabaceae	*Urahi alu* (Ass)	Tubers fleshy and edible; Taste liquor and eaten raw.	
97	*Rubus rugosus* Sm.	Rosaceae	*Ta:sinpusin* (Mis), *Jetulipoka* (Ass*)*	Ripe fruit is eaten; used for preparation of yeast culture.	
98	*Rumex maritimus* L.	Polygonaceae	*Bon suka sak* (Ass)	Leaves are eaten cooked for vegetable.	Cash income

99	*Sarcochlamys pulcherrima* (Rpxb.) Goud.	Urticaceae	*Ombe* (Mis,Bodo)	Tender shoots and leaves and fruits eaten cooked with pork by Misings.	Warm soup given to control diarrhea. Cash income
100	*Smilax ovalifolia* Roxb.	Smilacaceae	*Yorit* (Mis)	Tender leaves and shoots eaten fried with pork.	
101	*Solanum ferox* L.	Solanaceae	*Bangko* (Mis) *Titabhekuri* (Ass) *Khunthai* (Bodo)	Fruits cooked for vegetable or roasted; very bitter in taste.	Used for treatment of liver fluke. Cash income
102	*Solanum torvum* Sw.	Solanaceae	*Sitebangko* (Mis), *Hati-Khunthai Goukha* (Bodo)	Fruits and flowers are eaten fried or prepared for curry or *chutney*.	Cash income.
103	*Spilanthes paniculata* Wall. ex DC.	Asteraceae	*Marsang (Mis) Jati malkathi* (Ass), *Ushumoi* (Bodo).	Heads and shoots usually cooked with chicken and eaten as vegetable.	For toothache, dysentery, bronchial trouble and ulcer of mouth; strong local anesthesia effect. Boiled with chicken and the soup is given to mother to regain strength. Cash income
104	*Spondias pinnata* (L.f) Kurz	Anacardiaceae	*Dorge* (Mis), *Amora* (Ass) *Thaisuri* (Bodo)	Ripe fruits eaten; unripe green fruits made in curry or pickles. Seeds are also eaten.	
105	*Sterculia coccinea* Roxb.	Sterculiaceae	*Sagla papio* (Mis) *Nak sepata* (Ass)	Tender follicles or fruits eaten cooked. Seeds eaten fried or roasted.	
106	*Sterculia roxburghii* Wall.	Sterculiaceae	*Nakphona* (Ass)	The black seeds eaten after roasting.	
107	*Sterculia villosa* Roxb.	Sterculiaceae	*Sargog* (Mis) *Udal* (Ass, Bodo)	Seeds are eaten roasted or baked.	Bark for cordage
108	*Syzygium cuminii* (L.) Skeels	Myrtaceae	*Kula jamu* (Mis,Ass), *Khorjam*(Bodo)	Ripe fruits are edible.	Fruits and barks for treatment of Diabetes. Cash income.
109	*Syzygium fruticosum* (Roxb.) DC.	Myrtaceae	*Tepet Jamu* (Mis) *Kathiya jamu* (Ass)	Small, ripe fruits are eaten.	Antidiabetes. Fruits for cash income; fuelwood.
110	*Syzygium kurzii* (Duthie) Balak.	Myrtaceae	*Gi'rgum dotke* (Mis) *Bogijamu* (Ass).	Ripe fruits are eaten; sweet.	Medicine for urinary problems; stem for fuel. Cash income.
111	*Tapiria hirsuta* Hook.f.	Anacardiaceae	*Miditakkir* (Mis) *Dhindou Bogori Lata* (Ass)	Misings eat the tender shoots and leaves as vegetable. Ripe fruits edible.	
112	*Terminalia bellirica* (Gaertn.) Roxb.	Combretaceae	*Lokyo* (Mis) *Bhomura* (Ass)	Raw fruits are eaten; bitter.	Fruits in stomach disorder, pneumonia, gastric and indigestion. Cash income; fuel wood.
113	*Terminalia chebula* Retz.	Combretaceae	*Iilikang* (Mis), *Silika* (Ass). *Selekhai* (Bodo)	Raw fruits are eaten.	Dried or raw fruits in stomach disorders, pneumonia, gastric and indigestion. Cash income; fuel wood.
114	*Thumbergia grandiflora* Roxb.	Acanthaceae	*Kokua lota* (Ass)	Leaves are eaten cooked as vegetable	
115	*Trapa natans* L.var. *bispinosa* (Roxb.) Makino.	Trapaceae	*Bor singori* (Mis, Ass)	Seeds are eaten either raw or cooked	
116	*Trapa natans* L.var. *quadrispinosa* (Roxb.) Makino	Trapaceae	*Soru singori* (Mis, Ass)	Seeds are eaten either raw or cooked	
117	*Vigna vaxillata* (L.) Rich.	Fabaceae	*Bonoria urahi* (Ass)	Seeds are used as pulse. Tuberous roots are eaten cooked.	

118	*Vitex negudno* L.	Verbenaceae	*Posotia* (Mis,Ass).	Leaves are eaten cooked with small fish as vegetable.	Anti-inflammatory, antioxidant, hepatoprotective. Root as tonic to cure skin diseases.
119	*Zanthoxylum nitidum* (Roxb.) DC.	Rutaceae	*Ri'kom* (Mis)	Leaves, shoots and roots cooked with chicken and eaten as vegetable.	Tender shoots in preparation of yeast culture. Cash income
120	*Zanthoxylum rhetsa* (Roxb.) DC.	Rutaceae	*Onger* (Mis) *Bajruli*(Bodo)	Shoots and leaves when cooked with pork are preferred. .	Leaves for cash income.
121	*Ziziphus rugosa* Lamk.	Rhamnaceae	*Yumrang bogori* (Mis), *Bon bogori* (Ass)	Fruit is eaten fresh; Mising people make curry by cooking with fish	
122	*Zizyphus mauritiana* Lamk.	Rhamnaceae	*Bogori* (Mis, Ass)	Fruit eaten fresh; also prepared for curry with fish or arum by Mising people.	Fuel wood; fruits for cash income and coloring clothes

Potentials of wild foods of Poba RF and implications for conservation: Many wild plant foods reported from Poba RF have multiple functions like medicine, animal feed, building materials, religious and material needs and source of livelihoods. Many plants double as food and medicine while some food plants treble as food, medicine and feed (table-1). This invaluable dynamic link illustrates the indirect benefits of WEPs to mankind through consumption of livestock or its products. Many households collect food plants and other minor products from Poba RF and sell them in local markets to earn cash income. The forest thus, is also vital source of livelihoods and well-being for rural landless families. The ecological function of Poba RF is equally important. The forest forms the only barrier between Jonai Subdivisional Township and the eroding waters of the Laly river, in the south. Had it not been for the Poba forest, by now Jonai and adjoining areas would have reeled under water. Poba RF is indispensable in terms of food security, livelihoods and ecological stability in Jonai Subdivisional region. The forest, therefore, needs urgent prioritization for conservation for maintaining goods and services, and ecological stability.

Conclusion

Poba RF provides indispensable provisioning, regulating, cultural and supporting services to local communities. Being only natural forest in the entire Jonai Subdivisional area, Poba is the source of wild foods, and livelihoods and also socio-religious needs to local populace. Ecological role Poba RF as natural barrier against erosion by the Laly river is acknowledged and appreciated by one and all in the region. However, the forest has been facing threats due to overexploitation of resources and illegal felling for timber and due to poaching. The National Highway-52 in the North of the reserved forest has already fragmented the habitat preventing movement of wildlife and loss of ecosystem services provided by them. Resource use needs to be optimized to ensure sustainability of the forest. Poba RF needs urgent conservation initiatives for ecological stability, human well-being and also as local heritage. In the present time of changing climate, protected area is an important tool for conservation of genetic diversity which in turn will serve as germplasms for improvement of our crops, disease resistance and production of natural products.

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