

# Sustainable Livelihood Through the Utilization of Wild Bio Resources Among the Karbis of Assam

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**Abstract:** Sustainability of livelihood has become an important issue in the contemporary lives of the rural population of the tribals of northeast India. The Karbi tribes of Assam are directly dependent on the forest bioresources for their livelihood and for over all socio-economic development. The Karbis originally mountain and hill dwellers, have gradually moved down the plains for better lives have been dependent on forest for centuries. The rich culture heritage of traditional knowledge and dwindling forest and its resources has drastically altered their livelihood in the recent years. This scenario has created deep concerned among the Karbi tribes who are neither technically well equipped with the development drive nor in a position to continue its dependency over the bio resources they once had, the objectives of the paper is to analyzed the level of wild bio-resources dependency among the Karbis and to explore alternative for livelihood sustainability.

**Keywords:** Sustainability, Livelihood, dependency, Wild bio-resources, Forest

## Introduction

Sustainable development have become a catchword in the modern academic as well policy makers discourses. "Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meets their own needs" (Brundtland Commission) the concept has been in the public domain since the Earth Summit 1992 at the United Nations Conference on Environment and Development (UNCED) in Rio de Jenerio. Since then it has also been the most debatable topic in different international, nationals well as in the grass root level as its ramifications are felt in all round development at the same time the basic livelihood in the community level.

The Karbi tribe inhabiting the district of Karbi Anglong of Assam has a geographical area of 10434 sq.km, of which 42% of the total geographical area accounts for forest. The rich forest of the moist evergreen and moist mixed deciduous forest produce rich variety of wild bio-resources is one of the major sources of food in which the community depended for centuries.

Not only the Karbi people dependency on forest for food and other essential materials, but the forest were much more than its material utility. Their cultural needs and traditional knowledge at the same time spiritual needs were deeply connected to the forest. Therefore it is not wrong to say that for the Karbis their social, cultural and spiritual lives revolves around the forest. They not only worship the forest and the nature but also maintained sacred grooves thereby maintaining physical contact with the element. In Karbi Anglong there are seven noted sacred groves maintained for centuries, they are- Ronghang Rongbong, Inglongkiri, Ritasor, Bichikri, Arlongpuru Hamren, Mahamaya and Rek Anglong.

## Study area

Karbi Anglong district is located 92°50' and 94°25' east longitude and 25°05' and 26°15' north latitude (Guha 2002). The total geographical Area is 10434 sq kms which account for 13.3% of the total geographical area of the state of Assam. The region is inhabited by different tribes like karbi, Dimasa, Mishing, Hmar, Garo, Kuki, Bodo, Rengma and Tiwa. Traditionally all the tribes depend on the wild plants species for their likelihood. Among them Karbi tribe is the most dominant tribe of the Karbi Anglong districts. Karbi Anglong can be divided into two physiographic region i.e. the hills and the plains.

## Materials and Method

Following sample villages and areas were selected for the study. They are Hamren weekly market, kolonga market, Cheksolangso, Lorulangso, Taralangso of Diphu; Silbtheta Organic market, Borlangpher and Langsoliet where Karbis are dominant. Respondent are mostly composed of the farmers, family members and elderly people, daily and weekly vegetables vendors etc. Both primary data and secondary data were used, but bases of the study are the primary sources like personal interviews, group discussions and questionnaire.

## Results and discussion

The term bioresources means any resources i.e. biological in origin or nature, the species which are not cultivated on large scale commercially and local people collect these plants from forest or farm field for domestic requirement as a food. Wild plants and animal make important contribution to the life of rural communities. Throughout the world, wild or uncultivated plants provide a 'green social security' to hundreds of millions of people in the form of food, materials for clothes and shelter. From ancient time, plants have been used as a source of food, shelter, clothing, medicine, gum, resin, oil etc. (Aryal et al 2009). Wild edible plants play significant role in meeting requirement of local people in remote parts of the country (Sundriyal and Sundriyal 2001). The diversity in the wild vegetables not only gives variations in the diet but also provides nutritional diversity (Gawali and Narkhede 2018). Local people can earn extra income by selling wild edibles to the urban markets (Setiya et al 2016). The social and economic lives of the Karbi tribe is still very traditional and are heavily dependent on forest for their day to day lives. They not only get their food, medicine and other construction materials from forest but in the modern economic sense they earn extra income for the family by selling the forest product. In a way Karbi society is still self sustained forest based society.

In the given study research from the sample collected it was found that there are more than 1000 species of plants and animals present in the study areas. Out of the many 60 most abundantly used species of bio resources were identified having implications on livelihood as well as for commercial values.

The objective of the paper is to analyze the level of dependency on the bio resources by the karbi tribes and to explore the alternative for livelihood sustainability

The different bio resources recorded in the study research are presented as in the table:1

Sl.No	Botanical Name	Local Name	Plant part used	Medicinal uses
1	<i>Mimusops elengi</i> L. <i>Mimusops elengi</i> L.	Bokul	Fruits/leaves/barks/ flower/ seeds	Astringent, cooling, febrifuge
2	<i>Pandanus minuta</i> L. ( <i>Pandanaceae</i> )	Bapjuha arvo	Leaves	Constipation, boils, cold or flu symptoms
3	<i>Melastoma malabathricum</i> L. ( <i>Melastomataceae</i> )	Bik- Bik	leaves	Diabetes, high blood pressure
4	<i>Dillenia pentagyna</i> Roxb. ( <i>Dilleniaceae</i> )	Chirimpi	fruits	Wounds, burning sensation, diabetes
5	<i>Streblus asper</i> Lour. ( <i>Moraceae</i> )	Chiri Theso	fruits	Diarrhea, leprosy, toothache
6	<i>Ehretia acuminata</i> R.Brown ( <i>Ehretiaceae</i> ), Chorsim	Chorsim	Trees, woods	Fractures, syphilis, toothache
7	<i>Bambusa Arundinacea</i>	Chek Sudo	Tender shoots	Digestion, antioxidant
8	<i>Bambusa tulda</i>	Chek keme	Tender shoots	Digestion, antioxidant
9	<i>Baccaurea sapida</i> Lour. ( <i>Euphorbiaceae</i> )	Dampijuk	fruits	Rich in vitam C and iron
10.	<i>Polygonum chinense</i> L. ( <i>Polygonaceae</i> )	Delap	leaves	Insect sting/ snakebites
11	<i>Murraya paniculata</i> (L.) Jack ( <i>Rutaceae</i> ),	Dengjir	leaves	Dysentery, diarrhea
12	<i>Diplazium esculentum</i> Sw.( <i>Athyriaceae</i> )	Dungkek	Tender leaves	Toothache
14	<i>Gnetum gnemon</i> L. ( <i>Gnetaceae</i> )	Hanthu	leaves	Curing cough
15	<i>Bamboos Spinoza</i> Roxb. ( <i>Poaceae</i> )	Hen-up	Tender shoots	Antioxidant,
16	<i>Colocasia esculenta</i> (L.)Schott.( <i>Araceae</i> )	Henru	leaves	Internal hemorrhage, skin disorder, arthritis
17	<i>Hibiscus cannabinus</i> L. ( <i>Malvaceae</i> )	Hanserong ke-er	Leaves/seeds/fruits/f lowers	Vitamin C, beebites
18	<i>Hibiscus cannabinus</i> L. ( <i>Malvaceae</i> )	Hanserong ke- lok	Leaves/seeds/fruits/f lowers	Beebites, vitamin C
19	<i>Zingiber officinale</i> Rosc.	Hanso	roots	Common flu, cough, catterpillarbites
20	<i>Artocarpus Lacucha</i> Roxb.( <i>moraceae</i> )	Ingtat arong	Bark/fruits	Prevent heart disease
21	<i>Antidesma acidum</i> tetz. ( <i>Euphorbiaceae</i> )	Ingchum	Leaves/fruits	Cough/indigestion
22	<i>Abelmoschus manihot</i>	Jok-an	Flowers/leaves	Dysentery, diarrhea
23	<i>Syzygium cumini</i> (L.) Skeels ( <i>Myrtaceae</i> )	Jangmi thepo	fruits	Sourthroats, Asthma, ulcer,
24	<i>Monopterus Cuchia</i>	kumcherui	Flesh meat	Anemia, arthritis pain
25	<i>Sterculia alata</i> Roxb. ( <i>Sterculiaceae</i> )	Kok-terak	Bark/fruits	
26	<i>Dendrocalamus</i>	kaipho	Shoots/leaves	Antioxidant
27	<i>Bambusa Balcooa</i>	Kappa kapiho (bukuka)	Shoots/leaves	Antioxidant

28	<i>Celosia argentea</i> L. (Amaranthaceae)	Lehti	Flower/leaves	rituals
29	<i>Musa balbisiana</i> Colla. (Musaceae)	Langdung	Flower, fruits	Iron, magnesium
30	<i>Auricularia oricula</i>	Kimu Plak-plak	flowers	Fiber, protien
31	<i>Volvariella volvacea</i>	Sok pun kimu	flowers	Fiber, protien
32	<i>Pleurotus</i>	Mu plong	flowers	Fiber, protien
33	<i>Rhynchotechum ellipticum</i>	Mehek	leaves	Rich in minerals, magnesium and cure fever
34	<i>Nephelium longana</i> Camb. (Sapindaceae),	Marle arong	seeds	Diarrhea, fever
35	( <i>Myrica esculenta</i> Buch-Ham. Myricaceae)	Naka hanthor	leaves	Asthma, inflammation, anemia
36	(Bignoniaceae) <i>Oroxylum indicum</i> (L.)Vent.	Nopak ban	seeds	Anti-inflammatory, wonds
37	<i>Thunbergia grandiflora</i> Roxb. (Thunbergiaceae)	Nong nong arikang	Flowers/leaves	Antidote for poison
38	<i>Anguilla Bengalensis</i>	Nujung	flesh	Arthritis pain
39	<i>Dillenia indica</i> Roxb. (Dilleniaceae)	Plim plam	fruits	Vitamin c
40	<i>Garcinia lancaefolia</i> L. (Clusiaceae)	Pranso	fruits	Vitmin c
41	<i>Clerodendrumcolebrookianum</i> Walp. (Verbenaceae)	Pharklung	leaves	High blood prssure
41	<i>Smilax glabra</i> Roxb. (Smilaceae)	Phelangdung	fruits	Iron
43	<i>Donella roxburghii</i> (G. Don) <i>Pier ex Lecom</i> (Sapotacea),	Reng reng	Fruits/leaves	
44		Riho	fruits	Diahhrea, dysentry
45	<i>Manihot esculenta</i> Crantz. (Euphorbiaceae)	Rui-pharkong	potatoes	Treat hypertension, headache, fever etc
46	<i>Dioscorea hamiltonii</i> Hook.f. (Dioscoreaceae)	Rui-dok	-sweet potatoes	Cough, cold, stomach ach, skin disease, burns, dysentry
47	<i>Terminalia chebula</i> Retz (Combretaceae)	Siluka	fruits	Digestion, stomach ache, gastrointestinal agent, mild luxative
49	<i>Maesa indica</i> L. (Myrseniaceae),	Sesu	leaves	Insomnia, anaemia, toothache, piles, diarrhea, dysentry
50	<i>Elaeagnus latifolia</i> L.	Selengi	Fruits	Antioxidant, antiulcer, muscle relaxant, analgesic
51	<i>Diospyros embryopteris</i> Pers (Ebenaceae)	Sotoro	bark	Tumours, boils, styptic, dysentry
52	<i>Prunus nepaulensis</i> L. (Rosaceae),	Sompho	Seeds/leaves	Edema, diuretic agent, astringent
53	<i>Bridelia tomentosa</i> Blume (Euphorbiaceae)	Thebihi	Leaves/barks	Stomachache, high fever
54	<i>Carallia lucida</i> Roxb. (Rhizophoraceae)	Thengbu-thung	Leaves/ bark	Sapraemia, ulcer, inflammation of throat
55				
56	<i>Garcinia xanthochymos</i> Hook.f. <i>T. Anderson</i> (Clusiaceae),	The-champreng	fruits	Antidiabetic, antioxidant,
57	<i>Zanthoxylum limonella</i>	Thenngong arong	Trees/shrubs	Febrifugal, diuretic,

	<i>(Dennst.) Alston (Rutaceae),</i>			dental carries
58	<i>Cicca acida (L.) Merrill (Euphorbiaceae)</i>	Takeri thelu	fruits	Rheumatism, renal calculus, asthma, gonorrhoea, amnesia
59	<i>Phyllanthus emblica</i>	Thelu	Fruits	Immunity booster, antibacterial, astringent
60	<i>Alpinia nigra(Gaertn.) Burt (Zingiberaceae)</i>	Tara	Stem pith	Appetizer, tonic, bronchitis

### Dependency on bio resources

Wild vegetables refer to the species which are not cultivated on large scale commercially and local people collect these plants from forest or farm field for domestic requirement as a food. Wild plants make important contribution to the life of rural communities. Throughout the world, wild or uncultivated plants provide a 'green social security' to hundreds of millions of people in the form of food, materials for clothes and shelter. From ancient time, plants have been used as a source of food, shelter, clothing, medicine, gum, resin, oil etc (Aryal et al 2009). Wild edible plants play significant role in meeting requirement of local people in remote parts of the country (Sundriyal and Sundriyal 2001). The diversity in the wild vegetables not only gives variations in the diet but also provides nutritional diversity (Gawali and Narkhede 2018). Local people can earn extra income by selling wild edibles to the urban markets (Setiya et al 2016).

The relationships between human and plants is extremely crucial because plants have influenced on every prospect of human existence such as food, medicine, dyes, tools and many others (Balangcod and Balangcod ,2011). From the ancient times the Karbis has been dependant on forest and bio resources for food and other social, cultural, economic and spiritual needs. It has sustained them for centuries and even in the present modern technological age their dependency on forest has not been reduced. Their culture and food habit has not changed therefore they continue to depend for basic livelihood and other material needs. The forest of Karbi Anglong harbour variety of medicinal plants, herbs and tubers. Plants such as seluka, delap, jok-an, hanso, muplong, hanthu, mehek, kok-terak, henru has been highly used as a medicines and they are known to have curing properties for cough, stomachache, toothache, gastric, piles, fever, antidiabetic, asthma disease/ailments. Ginger (hanso) species has recorded the Geographical Indication register of India in 2014. Even if the modern medical medicine are available in the market still large percentage of rural populations are dependent on the traditional medicine for treatment. With the recent resurgence in the traditional healing systems in India for example Homeopathy, Ayurveda and other bio based natural healing has opened a new window for traditional healing practices for the people of Karbi Anglong.

Karbi women play a significant role in harnessing the wild bio resources for family and for the general livelihood for the community. Not only that they are the major agent for filling the local market with forest based bio resources in the form of vegetable, fruits, roots, mushrooms, and other insects as a source of protein. People built their house out of the product of natural bio resources like wood, bamboo, cane, thatches and also for different traditional rituals and religious practices viz Ajo Aseh, Sang Kelang, Peng Karkli, Chojun Karkli etc. Besides many handicraft and musical instrument are made up for both their domestics purpose and to earn their livelihood out of this. Besides the wild bio resources from the forest, many varieties of plants and vegetables are being cultivated side by side where jhum cultivation is done.

There is a high population increase in Kari Anglong due to both natural process and also due to large number of immigration from other parts of the country as well as from across international boundaries. Over the past few decades there is rapid decline of forest in Karbi Anglong for developmental projects as well as commercialization of forest and forest products. Large parts of the forest in the lower altitude are basically bamboo grooves and forest. In the past two decades there has been rampant exploitation of bamboos for paper mills. There is no clear policy for afforestation once the bamboo forest are cleared hence many such areas are turning into barren or degraded forest.

From the survey it has been found that most of the local forest dwellers are illiterate and deprived of jobs and therefore there is no regular income for the family hence their only source of income is the forest and its bio resources. They also cut trees for firewood and do regular business by selling wood blocks and bundles as a source of income. On all these accounts there is a rapid depletion of forest and bio resources in the region thereby creating serious concern over the sustainability of livelihood for the Karbis and other tribal communities in Karbi Anglong.

Sl.no	No. of respondent from villages	%	No. of respondent from vegetables vendors	%
1	16	35%	15	36%
2	7	15%	12	29%
3	10	22%	5	12%
4	12	26%	9	21%
total	45	98%	41	98%

Table 2: No of respondent

### Strategy for the alternate livelihood sustainability

Considering the present social, economic and cultural milieu of the Karbi tribes and their dependency on the forest and bio resources following strategies are forwarded:

- Since forest is the major source of likelihood and income for the people there is a need to evolve a clear policy for overall management of the forest and its byproduct. Public - private partnership is encouraged where community must have its ownership over the forest and its resources but state forest department coming in the way of helping conserving forest and its resources from rampant exploiters. Joint forest management and identification of certain bio-reserve and corridors for

maintaining the biological diversity of the region. There are seven major sacred forest in Karbi Anglong which is taken care by the community. It needs recognition from the state department and clear policy for conserving such sacred forest.

- Bamboo exploitation fetch easy money for the community and is one of the major source of income for the community, therefore it may not be easy to put a blanket ban on such activities without providing an alternative for income generation. Hence an alternative or afforestation of such areas are needed. Karbi Anglong enjoys a conducive climatic condition for variety of fruits and vegetables. With easy accessible transport and communications in the foothills fruit orchards can be an alternative.
- Karbi women have always been an active contributors as a farmer and foliage forest. There is a scope for Sericulture which has been traditionally done among the Karbis but is becoming a dying practice. Revamping sericulture with the help of government and other financial institutions can make a successful comeback for sericulture which is both traditionally and commercially viable. Such initiative have wide scope for individual venture as well as in group like self help groups or society.
- Rearing animals have always been a traditional practices of the Karbi culture. Karbi Anglong has wide scope for animal husbandry particularly piggyery, goaterry and poultry. Indigenous breeds flourishes with abundant green leaves and tubers for the animals. There is also possibilities of fishery for commercial purpose.
- The present supply of wild bio resources can be replaced by the domesticated animals and vegetables in the markets of not only Assam but in the neighbouring markets of Nagaland.
- Karbis are known for their excellent bamboo and cane work, wood carving and weavers. Their handiwork has been carried on for generations. The forest have rarities of bamboos and canes besides other long grasses used for making mats. When exotic products, organic products are increasingly in high demand there is high probability of producing high standard handiwork products from the region. What is needed is machinery and financial assistance from the government to enable the community to start with.
- In the recent years Karbi Anglong region have been experiencing a continuous Human-Elephant conflict, basically due to deforestation. There are immense losses of human labour in the paddy fields and habitations, while on the other hand elephant suffers losses of their habitat. This need a scientific approach to for long term solution so that both can coexist.
- There is also another problem of jhumming impact on forest. Large area of primary forest are being degraded due to the jhum cultivation. The replacement of primary forest by secondary forest has greatly impacted the wild bio resource regime. Thus, the plausible alternative is to reduce dependance on forest and bio resources and commensurate with other alternatives like animal farming, horticulture etc. Along with the traditional ones.

#### **Conclusion:**

Traditionally there is a close relations between the Karbi people and the forest for their livelihood. It has also been found out that its relationship is not only material benefits but much beyond for cultural needs and spiritual needs as well. Such continuity has been there for generations is now under threat due to deforestation and other exogenous factors like the population and developmental forces. Regretfully, there is no clear policy of the government for incorporating the traditional knowledge based information from the community so as to complement modern governmental policies to make an affective policy for the community. There is hardly public-private partnership in conservation of forest and its bio resources. Communities struggle to safeguard and harness whatever little is left while on the other hand tries to balance between the onslaught of the modern developmental process. There is a need to evolve a clear policy of partnership between the government and the community by taking into considerations the cultural aspect in managing and conserving the forest and bio resources while human resource development must be emphasized for all round development.

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