

Language, Culture and Biodiversity: Issues Concerning North East India

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Abstract:

The concept of bio-diversity emerged as one of the central concerns in the end part of the 20th century to understand issues of utilization as well as sustainability which is intricately linked with concept of cultural diversity. This concept is also created unique niche to address the right and knowledge system of the Indigenous people across the globe and thus leading to the importance of language which is the key for transmission of such huge knowledge systems. The present paper is an attempt to explore the such linkages between bio-cultural diversity and languages taking North East India as a wider context and citing multiple examples from the state of Arunachal Pradesh, which is one of the bio-diversity hotspots having large number of Indigenous people who are still having close ties with their surrounding ecosystems.

Key Words: *Bio-diversity, cultural- diversity, conservation, legal regime, tribe, indigenous people, knowledge systems, edible plants.*

Introduction

Biological Diversity as a conceptual construct emerged in the latter part of the 20th century. The transition from wildlife conservation to the conservation of biological diversity took place during this period. The passage of the Convention on Biological Diversity in 1992 and the widespread acceptance of the Convention signalled the emergence of the discourse of conservation and sustainable utilization of biodiversity at the international level. Subsequently the importance of cultural diversity also has been widely recognized as an intrinsic chord in promoting biodiversity conservation and the bedrock for the maintenance and transmission of traditional ecological Knowledge. Bio-cultural diversity is not uniformly distributed and most of it is concentrated in the humid and semi-arid tropical and subtropical regions concentrated in around 34 major hotspots which account for over 90% of world's biological and cultural diversity (Conservation International 2010). It also has been widely recognized that mountains are home to most of the planet's bio-

cultural diversity and it is important to develop a nuanced approach to address these realities (Stepp et al 2005 and Turin 2005).

The emergence of the global bio-cultural diversity conservation regime

Bio-diversity conservation in the formal western sense started probably with the establishment of the Yellowstone National Park, though conservation of wildlife has been an age-old phenomenon. The transition to a holistic bio-cultural approach started with the passage of the Convention on Biological Diversity in 1992. The three pillars of the CBD are the conservation, sustainable usage of biodiversity and the fair and equitable sharing of benefits from access to biodiversity/ biodiversity-based knowledge. The CBD is important for it recognizes the rights of indigenous people over their knowledge, innovations and practices and calls upon parties to the convention to respect preserve and maintain such knowledge, innovations and practices relevant for the conservation and sustainable use of biological diversity. Article 8j of the CBD focuses on benefit sharing provisions and stipulates that benefit sharing can be accomplished through the utilization of knowledge, innovations and practices of indigenous and local communities. These articles (8(j), 10 (c) 11 and 15) talk about the importance of Indigenous/ local communities and their knowledge systems along with the need to incorporate these knowledge systems into the management of biological resources and promulgate a system of access to and benefit sharing from biodiversity-based knowledge (CBD 2007). There was also an acknowledgement of the importance of linguistic diversity which is reflected in the preamble to the CBD and also in the CBD working papers that outline the linkages between linguistic and biological diversity and acknowledge the importance of language as a vehicle for the transmission of biodiversity-based knowledge systems. (CBD 2004). Thus, today the international legal regime is firmly rooted in the interconnectedness of biological and cultural diversity with language being looked at as the medium of transmission of these knowledge systems. The following paragraphs will trace the evolution of this process in the context of the Greater Himalayan region in general and North-east India in particular.

The setting of north-east India:

North -east India comprises of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland. Mountains and hills cover most of Arunachal Pradesh, Mizoram, Nagaland, Meghalaya, Sikkim and about half of Tripura, one-fifth of Assam and nine-tenth of Manipur. The northern part of the region is a part of the eastern Himalayan region but the rest of the region comprises of a series of hill ranges, which merge into the Arakan Yoma.

According to the 2001 Census of India, the total population of the north- east is 45,772,118 with more than 80% living in the rural areas. Overall, tribal account for over 27.7 % of the total population of this region. However, in Arunachal Pradesh, Manipur, Meghalaya, Mizoram and Nagaland, scheduled tribes comprise more than 60% of the population. This gives these states a predominantly tribal character.

The primary mode of subsistence is shifting cultivation, a land use practice that is in many ways one of the major reasons for the maintenance of the mosaic landscapes of forests interspersed with *Jhum* i.e shifting cultivation fallows. The area also is extremely rich in faunal resources and houses representative fauna from the Indian, Malayan and the Palearctic realms, that are also critically endangered (Chatterjee 2006).

North-east India is linked to the rest of India through a very narrow 21 km long corridor called the chicken's neck which passes through West Bengal in eastern India. The region is ethnically distinct from rest of India with *swidden* cultivation being the primary land use. This region was by and large lightly administered in the colonial era, especially in the hill states, which resulted in a geographical and political isolation from the rest of colonial India. Thus, just after India's independence, as the rule of the central government was strengthened, the result was that many isolated hill communities became involved in separatist movements. This forced the central government to address the social, political and economic grievances and the real difference that exists between the so-called mainland and this region. The process followed was through amendments to the Indian Constitution such as the creation of the Sixth Schedule and the incorporation of article 371. This process covered the whole gamut of natural resource management, but remained largely a paper exercise and thus failed to meet the aspirations of the people of the region (Hazarika 1996, Saikia 2003).

Bio-cultural diversity of north –east India:

This region is arguably the richest among all the different parts of India. It is a part of two major bio-diversity hotspots namely the Himalayan and the Indo-Burma (Conservation International 2010). It is also a part of the Himalayan hotspot of linguistic diversity (Turin 2007 and Ved 2007, UNESCO 2010). There are over an estimated 600 languages spoken in the Himalayan region and North-east India accounts for quite a few of them though there is considerable overlap about the figures. It ranges from figures of 325 (Ved 2007) to over 200 living languages (Turin 2007) to UNESCO's atlas coming up with a figure of 107 living languages. The fact of the matter is that while there are differences in methodological prescriptions between these studies all of them agree on the fact that there exists a large number of spoken or living languages. As linguistic diversity is a well accepted proxy indicator for cultural diversity one can very well imagine the scale of cultural diversity that is being talked about here.

Existing biodiversity governance systems of north-east India

The biodiversity governance systems are inherently different from rest of India and as stated above has also survived the onslaught of colonial rule as this area was comparatively lightly administered. In many ways it is a bridge between south and south-east Asia and thus these land use systems have a lot of affinity with the land use systems of South-east Asia.

The primary land ownership structure in the north-east has from time immemorial been community owned land, there are numerous examples of community or clan-based ownership in the region ranging across all the hill states, the following examples from many of the states in the region testifies to this fact.

Community lands, including forest areas, have a number of uses, which are reflected in their names. In the Khasi and Jaintia hills of Meghalaya, the functions and purposes of most forests are based on village administration and religious perceptions. Community forests are known as *Law Kyntang*, *Law Adong*, *Law Lyngdoh*, *Law Shnong*, *Law Raij*, *Law Sumar*, *Law Kur*, etc, denoting the usages to which they are supposed to be put (Dutta 2001). Land tenure was not disturbed by the colonial presence in these areas, as only a few areas were acquired outright by the British administration, while most of the smaller territories were treated as though they were beyond the borders of

colonial India (Simon 1996). After independence, the prevailing land tenure and practices were recognized and maintained in the district council legislation.

In the case of Mizoram there are a lot of forests registered as village safety and supply reserves, which in many cases predate the colonial presence in Mizoram (Singh 1996). In the case of Nagaland there are village forests, clan forests, community wildlife sanctuaries (Charles Chasie personal communication & Choudhary 1998). In Arunachal Pradesh there are a host of community-managed areas like the sacred forests of the *Nishis*, the *Anchal* Reserve Forests across the state, monastery forests of Bomdila and Tawang (Sudipto Chatterjee personal communication). Concept of Clan and village lands is found among many Tani group as well as non-Tani group of tribes as evident from various ethnographic studies.

The path to a more bio-cultural legal framework in India

In India forest and wildlife are a part of the concurrent list of the Indian constitution. The oldest law in force with reference to the question of ownership over biodiversity/ forests/ wildlife is the forest act of 1927. There have been a host of subsequent legislation since including the Wildlife Protection Act 1972 along with its amendments in 2002, the forest conservation act of 1980, the Biodiversity act of 2004 and Forest Rights Act of 2006. These legislations have by and large espoused a very strong guns and guards' approach to biodiversity conservation. The overall thrust has been to protect bio-diversity from the people and not with the people. Though of late things are changing and there are quite a few sections in both the Biodiversity act (Section 41 and the rules framed under the Forests Right act, the wildlife protection act 2002) which are a testimony to this changing mindset (adapted from Choudhary 2006, MOTF 2006, NBA 2005, Upadhyay 2002).

The constitution also acknowledges the different notions of forest ownership and governance structures in Mizoram and Nagaland through article 371 and also confers the ownership and management responsibility of land and forest resources other than reserved forests to autonomous district councils established under the sixth schedule in the states of Meghalaya, Assam, Mizoram. (MOLJ 2007). Thus, though overall thrust still is a very state centric biodiversity conservation regime small but important changes are seeping in, people's conservation initiatives are being acknowledged, the importance of traditional biodiversity-based knowledge systems are also being understood. Bio-cultural notions of conservation appear to be on the anvil and definitely it will be the case. The following paragraphs outline the omissions and commissions of this process as it slowly evolves especially in north-east India.

Discussion:

These laws by and large have not been drafted looking at the diverse linkages and actions that are required for the conservation of bio-diversity, they have put forth a very narrow understanding of the notions of biodiversity conservation, focusing on a very state centric and hierarchical management and acquisition system along with a very peripheral acknowledgement of the cultural linkages of biodiversity usage.

The issue of cultural diversity, which is bedrock of the entire benefit-sharing scenario, is of critical importance. The entire Himalayan region is a hot spot of cultural diversity and it is more so a case in the context of the eastern Himalayas of which north-east India is an intrinsic part. This is understood by the fact that over 400 languages are spoken throughout the Himalayas with most of

the speakers of these languages numbering less than 100,000 speakers (Turin 2007). The legal regimes while they acknowledge the fact that this diversity is important do not really address this issue of crucial importance, for it is a language, which carries all the knowledge associated with the speakers of the language. There is no special provision for the protection of these endangered languages in the biodiversity rich areas and in some cases the different arms of the state pursue different policies in this regard. A good example is the current scenario in the north-east Indian state of Arunachal Pradesh, its bio-cultural diversity hotspot located in the eastern Himalayan region and today as a part of “nation building” Hindi the Indian official language has been aggressively promoted in this state. The end result being that Hindi is becoming the lingua franca and the local tribal languages are beginning to have less speakers, in the long run it means a loss of biodiversity-based knowledge as the children of today fail to pick up the language-based knowledge from their forefathers (Mojib Riba, Faculty of Mass Communication, Rajiv Gandhi University, Itanagar, personal communication). The linkages between the linguistic diversity and floristic diversity in the state is highlighted by the fact that there exists a rich nomenclature of plant species in all the tribal languages of the state. Appendix 1 carries a list of timber species along with their local and scientific names in order to give an idea of this biodiversity based cultural knowledge system. Large number of timber plants known by the tribes are appended along with local and scientific names to supplement the linkages between linguistic diversity and floral diversity in the state (Appendix: I).

A few tribe specific examples can be given here to illustrate the point-taking cue from the food productive or gathering strategy of a tribe called Aka, a small as well as lesser-known tribe living in both West as well as East Kameng district of Arunachal Pradesh.

Food gathering is an important part of their occupation and a supplementary source of livelihood. The Akas mainly depend on the nearby forests for their requirement of vegetables, fruits, barks, edible plants and leaves, etc. the collections of forest produce i.e., vegetables, mushrooms, etc falls within the province of womenfolk. Collection of fruits, tree barks, edible plants and others, which involves hard work, were the work of the men. Some of these forest produces are being collected throughout the year, some of which are collected for six months and some of which are collected for only one or two months. The food gathering pursuits among the Akas, however, do not involve co-operative activity as evident among the premier food gatherer communities of the country. Women or girls in small groups, or even individually, collect the vegetables from the forest whenever they need.

The edible plants collected in the month of January includes wild plants locally known as *husapendu*, *mayesi*, *pesu*, *pesa*, etc. and the fruits collected are locally known as *syochulje*, *syotro*, *kesfjein*, *emdyin*, etc. Different varieties of mushrooms locally known as *lumeoje*, *lumeofu*, *lumeotenta*, *lumeofusuw*, *tasile*, etc. are collected by women/girls in the month of February. In this month other vegetables such as banana flower (*wolbu*), *pedba*, *methi-troksi*, *wulochanchi* are also gathered. The same vegetables are used to collect in the next month also i.e., March. The two months i.e., April and May are restricted months and no forest produce are being collected because in these months the plants are not fit for consumption. So, these people fully depend on their *jhum* fields for vegetables in these two months. In the month of June vegetables known as *fumpem*, mushroom (*lumeogji*), bamboos (*bjechi*) are gathered from the forests. Fruits locally known as *lugi*,

kotocovo, *sejilafo syovaji*, etc. are collected to meet the food shortage in the month of June. Some species of bamboo such as *sega*, *mesajo*, *gedri*, are collected in the month of July and also fruits known as *geje*, *syobee*, *wotro*, are gathered in the same month. No vegetables or edible plants are available in the forest in the months of August and September. So, these people depend on the jhum fields for their requirement of vegetables in these months. Another important edible wild plant locally known as *sim-nekchi* is gathered by these people during the period of shortage in food. Also, there are other edible plants known as *sawo*, *saje*, *gudrolu*, *lumo*, etc. which are collected for consumption during the period of food shortage. Likewise, the Akas collect vegetables, fruits, etc. from the nearby forests round the year (Appendix: II, III and IV). In this process there develops a good deal of relationship with the forest ecology. The forest provides the necessities of these people and in turn these people spare the small plants. Some months are considered as restricted months when they do not collect any forest item (Nimachow and Chaudhuri: 2012:249-50). Similarly, tremendous diversity in the nomenclature of fish species can be found among the Tani group of tribes where we can locate local names of similar fish species are different even among the Nyishi, Adis and the Galos, three major tribes of the state (please see Appendix:V). It is a well-known fact that leaving a few tribes (Apatani, Khampti etc) majority of the tribes are primarily dependent on shifting hill cultivation though they have shown remarkable diversity of crops produced in shifting or jhum fields (Appendix :VI).

It may be added here that bamboo and cane are two floral elements intricately associated with the livelihood strategy of the tribes of Arunachal and this state is known for their species diversity. Tribes are having their own nomenclatures depending on their utilitarian values. For instance, Adis of Damro village use twelve wild varieties of bamboos which are known in their language as Eyom, Tok, Tape, Tabum, Tadol, Tappin, Tagil, Taban, Taboh boik, Taboh borom, Tanil and Tanang. Similarly, they identify seven varieties of canes, such as, Esong, Takat, Tapi, Ramang, Abo, Jeying and Yoyi (Megu:2007:48).

This issue is not being looked at either by the Arunachal State biodiversity board or the National Biodiversity Authority. The approach so far has remained a documentation approach, which works more as a museum narrative rather than the used in conservation / revival of these dynamic traditional knowledge systems. They see the role of local communities as basically being documenters of their traditional knowledge rather than as active managers of natural resources and associated traditional knowledge. A very good example in this regard is the Indian Biodiversity Act and the associated rules which look at the role of the biodiversity management committees only as documenters of traditional knowledge and very marginally as managers.

The norm has been to enable the state to be the major arbitrator for bio- resource collection, fixing benefits and also with a very strong emphasis on knowledge acquisition without the concomitant thrust on knowledge transmission as some of these examples show.

Though some of the laws do recognize the rights over traditional knowledge systems, the tendency to impose a sense of hierarchical importance *vis -a -vis* the formal systems of knowledge is very much the norm. This means that though the rhetoric of rights for traditional / indigenous communities is adhered to in line with International prescriptions, the reality on the ground may be very different. The following example will highlight the point. Section 41 (1) of the Indian biodiversity act provides the space for local communities to manage and conserve local varieties. It

may provide an important incentive for defending and value adding to different forms of *swidden* agriculture. However, if one looks at the actual prescriptions of the state governments in the North-eastern Region where shifting cultivation is the dominant form of land use the tenor is very much to replace *swidden* agriculture with commercial agriculture (Saikia 2003).

Consequently, one can see that the discourse on traditional knowledge and how it has by and large remained highly rhetorical and a very state centric one, where the knowledge is deemed to be important but not the resources that sustain this knowledge. In North-east India where the state does not control in most cases the access to these resources the battle lines have been drawn while on the one hand the government reiterates its commitment about the need to protect traditional knowledge systems on the other hand there are a host of attempts being made to assert control over community-controlled biodiversity rich landscapes. There is also no understanding of how to ensure that this bio-diversity based traditional knowledge systems would be transmitted to the next generation. It is only through the medium of language that this transmission takes place.

The way forward

The state needs to develop a legal regime that addresses this reality may be, through an integration of existing legal prescriptions that deal with language loss and also develop a regime of fiscal incentives to enable the transmission of bio-diversity based knowledge systems to the next generation. The need of the hour is to probably go beyond documentation to more of a system that values and respects traditional knowledge as a living system. The role of language as the key transmission agent needs to be highlighted especially in the biodiversity rich areas of north-east India. The state also needs to ensure that development interventions are planned keeping in mind potential impact on bio-cultural diversity. Last but not the least as the linkages between language, culture and biodiversity are very much in the hands of the community in north-east India, the state should actually think of itself as more of a facilitator rather than as a manager of resources. This would not only enable the state to win the trust of these communities but also at the same time can contribute to the conservation processes in the region.

Conclusion:

This paper explores the narratives of international discourse on the protection and preservation of traditional knowledge systems in particular the linkages between Language, Culture and Biodiversity and looks at how this discourse has evolved in the context of north-east India. The thrust of the paper is to explore and suggest ways and means to develop a more nuanced and grounded legal and policy regime that would recognize and conserve bio-cultural diversity especially in the context of north-east India.

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Appendix: I

Commercial timber species known to the people of Arunachal Pradesh

Local Name	Botanical Name
Pajihuta	<i>Actinodaphne obovate</i>
Moz	<i>Albizia lucida</i>
Satiana	<i>Alstonia schoaris</i>
Jutlly	<i>Altingia excelsa</i>
Kadam	<i>Anthcephalus chinensis</i>
Dewa Chali	<i>Artocarpus lakoocha</i>
Kanchon	<i>Bauhinia variegata</i>
Dewa chali	<i>Atocarpus chinensis</i>
Kanchon	<i>Bauhinia variegata</i>
Bonhingalo	<i>Beilschmiedia pseudomicropora</i>
Birch	<i>Betula alnoides</i>
Urium	<i>Bischofia javanica</i>
Simul	<i>Bombax ceiba</i>
Dhuna	<i>Canaririum bengalense</i>
Hingori	<i>Castonopsis indica</i>
Bogipoma	<i>Chukrasia tabularis</i>
Gonsoroi	<i>Cinnamomum glaucescens</i>
Hollong	<i>Dipterocarpus retusus</i>
Khokan	<i>Dunbanga grandiflora</i>
Gondhaki poma	<i>Dysoxylum alliarium</i>
Lali	<i>Dysoxylum gobarum</i>
Tekra	<i>Garcinia cowa</i>
Gomari	<i>Gmelina arborea</i>
Chalmugra	<i>Gynocardia odorata</i>
Pichola	<i>Kydia calycina</i>
Morali	<i>Macaranga denticulata</i>
Boramthuri	<i>Magnolia pterocarpa</i>
Sopa	<i>Michelia doltsopa</i>
Bonsum	<i>Phoebe Goalparensis</i>
Mekahi	<i>Phoebe paniculata</i>
Poma	<i>Toona ciliata</i>

Source: Baishya, Balodi and Pal, 2002:193)

Appendix: II
Fruits gathered from the Forest by the Akas

Local Name	English Name	Scientific Name	How Consumed
<i>Munumu</i>	Bansum	Phoebe spp.	This is a big tree mostly used for timber. On the same time fruits are collected and outer cover of it is consumed in raw form with chilly and salt.
<i>Kotocovo</i>	Wild lichi	--	It is somewhat similar to lichi. It is consumed by removing the outer cover.
<i>Syobolofisin</i>	--	--	Inner portion is eaten.
<i>Neuyi</i>	--	--	Cleaned by water and the whole parts are eaten in raw form.
<i>Syobee</i>	--	--	Outer cover is eaten with chilly and salt.
<i>Luduje</i>	--	--	Outer thorny portion is removed and inner portion is eaten.
<i>Lugie</i>	--	--	Consumed by boiling, raw and streaming.
<i>Gejey</i>	--	--	Consumed by smoked dry.
<i>Kusuwin</i>	--	--	Eaten in raw form and by putting on the bamboo cups.
<i>Kusukabro</i>	--	--	Eaten in raw form and by putting on the bamboo cups.
<i>Lufuje</i>	--	--	Inner parts are eaten.
<i>Wusa</i>	Wild banana	--	Eaten by removing the seeds.
<i>Syotuo</i>	--	--	A kind of fruit, which is soar in taste. And inner portion is eaten.

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Appendix:III
Name of Animals eaten by the Akas

Local Name	English Name	Scientific Name	How Consumed
<i>Fumi</i>	Deer	--	Roasting directly burnt on the fire and also by boiling/frying.
<i>Sucho</i>	Bear	--	-Do-. Not eaten by the women folk.
<i>Fuhu</i>	Wild Pig	<i>Sus domesticus</i>	-Do-
<i>Fumi-cho</i>	Reindeer	--	-Do-
<i>Wofu</i>	--	--	-Do-
<i>Sije</i>	--	--	-Do-
<i>Syofu</i>	Monkey	<i>Macaca radiata</i>	-Do- Not eaten by the women folk
<i>Methifu</i>	Wild mithun	<i>Bos frontalis</i>	-Do-
<i>Fuggi</i>	--	--	-Do-

<i>Wuve</i>	--	--	-Do-
<i>Mujo</i>	--	--	-Do-
<i>Muju</i>	Wild banana	--	-Do-
<i>Pse</i>	Squirrel of big size	<i>Dremomys lokriah</i>	Roasting as well as smoked dry. Not eaten by the women.
<i>Psesinsa</i>	Squirrel	<i>Hylopetis alboriger</i>	Smoked dry, mostly roasting and boil. Not eaten by the women.
<i>Rumo inyigro</i>	Rat (wild)	--	Smoked dry, roasting and boiling. Not eaten by the women.

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Appendix: IV

Birds eaten by the Akas

Local Name	English Name	Scientific Name	How Consumed
<i>Kesajyo</i>	--	--	Roasting, smoked dry, boiling / frying and burning directly on the fire. Consumed by all.
<i>Their</i>	--	--	-Do-
<i>Sujo</i>	--	--	-Do-
<i>Degje</i>	--	--	-Do-
<i>Sewbam</i>	--	--	-Do-
<i>Futuchem</i>	--	--	-Do-
<i>Ledam</i>	--	--	-Do-
<i>Pseglu</i>	--	--	-Do-
<i>Pacho</i>	Parrot	--	-Do-
<i>Sise</i>	--	--	-Do-
<i>Draindradum</i>	--	--	-Do-
<i>Subeau</i>	Wild pigeon	--	-Do-
<i>Subeau-jum</i>	--	--	-Do-
<i>Subeau-kro</i>	--	--	-Do-
<i>Salvo</i>	--	--	-Do- not eaten by the women.
<i>Gudru</i>	Hornbill	--	-Do-

Nimachow, G. and S. K. Chaudhuri .2012:253

Appendix:V**List of fish species known and taken by The Nyishi, Adi and Galo tribes of Arunachal Pradesh**

Sl.No	Scientific Name	Nyishi Name	Adi Name	Galo Name
1	Aborichthys elongetus Hora	Rimum, Ribb	Ribi	Ribo/ ribii
2	Lepidocephadichthys(Hamilton)	-----	Daral	Ringum
3	channa sp.	Tali, Taal	Talum	Taal/taalo/taali
4	Pterocryptis afghana (Gunther)	-----	Beyek	Tami/tami
5	Charias batrachus (Linnaeus)	Ngara	Mager	Magur
6	Batasio fasciolatus Ng	Ngapi, papio	Tapong	Orchin
7	Barilius bendelisis (Hamilton)	Ngub	Taseng	Orpu
8	Barilius bendelisis (Hamilton)	Tapiong	-----	Ortak
9	Barilius barna (Hamilton)	Ngapi	-----	Orpo
10	Batasiofasciolatus	Ngarang	-----	Nare /nara
11	Badis sp.	Ngara, petch	-----	
12	Parachilopteryx hodgarti (Hora)	Nguchar	Beyok	Ngocher
13	Devvario aequipinnatus (McClelland)	Ngapi	Tapong	Tapo
14	Mystus vittatus (Bloch)	-----	Narang	Nare / nara
15	Botia rostrata Gunther	-----		Rigek
16	Balitora brucei Gray	Ngoku	Beyok	
17	Semiplotus semiplotus (McClelland)	Apatani ngui	Orpe	Orse
18	Glyptothorax sp	Nguli, Ngara	Ngorang Pakbo	Ngora pakka
19	Adhesive apparatus of glyptothorax	Ngara	Ngobel	Ngora pakka
20	Tor putitora (Hamilton)	Tenger, Ngachu	Biksik	Gase
21	Tort or (Hamilton)	-----	Rulbung	Orbo/ ngosi
22	Garra gotyla	Ngapii	Ngoyo	Ngoyo
23	Amblyceps apangi Nath and Dey	Ribii	-----	Tayek
24	Amblyceps apangi Nath and Dey	Ngara	-----	Tayek
25	Amblyceps apangi Nath and Dey	-----	-----	Tayek
26	Amblyceps apangi Nath and Dey	-----	-----	Tayek
27	Crossocheilus latius (Hamilton)	-----	-----	Yirso
28	Aborichthys elongetus Hora	Ribb, Ribii	Ribi	Ribo bili
29	Pareuchiloglanis kamengensis Jayaram	Ngara	-----	Ngoka pagra
30	Semiplotus semiplotus (McClelland)	Ngoge	Piling	Orse
31	Semiplotus semiplotus(McClelland)	-----	-----	Orse
32	Mastercembelus armatus (Lacepede)	Germe	-----	Germek
33	Batasio fasciolatus Ng	-----	Ngoko	Nare
34	Batasio fasciolatus Ng	-----	Daral	Orsin
35	Aborichthys elongetus Hora	Ribuui	Taseng	Ribo/ribi
36	Barilius bendelisis (Hamilton)	Papio	Gariong	Orpo
37	Barilius bendelisis (Hamilton)	Nguli, Ngage	-----	Orpu
38	Bendelisis barna (Hamilton)		Biksik	Ortak
39	Neolissochilus hexagonolepis (McClelland)	----	-----	Gase/gahe

40	Tor tor (Hamilton)	Ngachu	-----	Orbo /ngosi
41	Neolissochilus hexagonolepis (McClelland)	-----	-----	
42	Schizothorax richardsonii (Gray)	Ngarang	Kadang/ Ngoying	Kada
43	Schizothorax richardsonii (Gray)	Aarches	-----	Katum
44	Schizothorax richardsonii (Gray)	-----	-----	Yirso
45	Tort or (Hamilton)	-----	Biksik	
46	Cirrhinus mrigala (Hamilton)	Tenger	-----	Ngopi
47	Schizothorax sp.	-----	Ngoying	
48	Schizothorax sp	Ngori, Ngoring	Kadang	Kada
49	Botia rostrata Gunther	Lichi, Assam Ngai	-----	Ordgalo
50	Botia sp.	Kaiya	Ribi	Rani
51	Puntius sophore (Hamilton)	Patches	Orpe	Orpek
52	Neolissochilus hexagonolepis (McClelland)	Ngage	-----	Gase
53	Acanthobotis botia (Hamilton)	-----	-----	Ringum
54	Aborichthys elongatus Hora	Ribb, Tayek	Ribi	Ribo
55	Bangana dero (Heckel)	Tenger	Ngopi	Ngopi
56	Garra gotyla (Gray)	Ngayo, Ngoka	Ripi	Ngotup
57	Garra annandalei Hora	-----	-----	Ngoyu
58	Garra sp.	-----	-----	Ngoyi tuba

Source: Chaudhuri, Das, Sarkar, et al. 2008)

Appendix :VI

Major crops grown by the Galo tribe in shifting cultivation

Serial number	Name of crops grown in jhum field		Utilizing part	Mode of consumption	Cultivating season	Harvesting season	Purpose
	English name	Local name					
1	Brinjal	<i>Bayom</i>	fruit	boil	March-April	May-October	Self consumption &commercial
2	Chilly	<i>Yaluk</i>	fruit	Raw, boil & dry	April-May	August-December	Self consumption &commercial
3		<i>Kopii</i>	fruit	boil	March-April	July-October	Self consumption &commercial
4	Green Onion	<i>Diilap</i>	Tuber	Boil & raw	April-May	August-December	Self consumption &commercial
5	Ginger	<i>Taake</i>	Tuber	Raw	April-May	November-February	Self consumption &commercial
6	—	<i>Baak</i>	Fruit	Boil	April-May	July-October	Self consumption

7	Paddy	<i>Am</i>	grains	boil	March-April	August-September	Self consumption
8	Millet	<i>Tami</i>	Grains	boil	April	August-September	Self consumption
9	Mustard plant	<i>Geiyi/Tuk</i>	Leaf	boil	March	March-July	Self-consumption &commercial
10	Beans	<i>Peran</i>	fruit	boil	March-April	July-October	Self-consumption &commercial
11	Ladies Finger	<i>Bendi</i>	Fruit	Boil	March	May-August	Self-consumption &commercial
12	Pumkin	<i>Patum</i>	Fruit& Leaf	Boil	March-April	July-September	Self-consumption &commercial
13	White gourd	<i>Paar</i>	Fruit	boil	March-April	August-December	Self-consumption &commercial
14	Cucumber	<i>Meku/Meb</i>	Fruit	Raw	March-April	July-August	Self consumption
15	Bittergourd	<i>Kelera</i>	Fruit	Boil	April	July-September	Self consumption &commercial
16	Colossians	<i>Enyo</i>	Tuber	Boil & Roasted	April	October-January	Self consumption &commercial

Source: Mari Lollen:2009 : 55

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