

## IEKS and Sustainable Land Resource Management - a surveillance on the practices among the *Tangsa Naga* and *Tangkhul Naga* of North East India

Jayanta Kumar Sarma\*<sup>1</sup> & Ranjan Saikia<sup>2</sup>

<sup>1</sup>Debasis Residency, Manikanchan Path, Beltola, Guwahati-781028, Assam, India;

<sup>2</sup>Retired HOD, Geography, Cotton, College, Guwahati-781001, Assam, India  
E-mail; jayanta.sarma@gmail.com

Received 14.9.11; revised 30.01.12

The paper will look into the sustainable component of Land Resource management Practices and associated IEKS among the *Tangsa Naga* communities of Pataki Hills (Tinsukia district of Assam) and *Tangkhul Naga* communities of Naga-Lusai Hills (Ukhrul district of Manipur) of Eastern Himalayas. It will try to identify the attributes of holistic consideration, nurturing of diversity and ecological integrity, along with issues of integration and symbiosis to ascertain equality and equity in their practices. In so doing, paper will portray the spatial pattern of their land uses on the basis of the data base already developed through Participatory GIS (PGIS) field exercises, along with doctrine of management practices through land ownership, land use decision making processes, crop and cultivar selection processes, water use regulation and control, etc on the basis of data collected through PRA exercises using the PRA tool, viz. FGD, seasonality assessment, transect walk and transect analysis. Moreover, Q-GIS platform is used for analysis and depicting the spatial pattern.

**Keywords:** Land use, Indigenous Ecological Knowledge System, Sustainability

**IPC Int. Cl.<sup>8</sup>:** A01, H01L 51/00

### Introduction

The land resource management included the location decision, spatial arrangement of land use, and the controlling systems of land use practices. Successful resource management systems require flexible social mechanisms for continual adjustment to environmental dynamics. Thus, institutional structures are needed to take environmental viability and ecological feed backs into account and with capacity of responding to such dynamics. There exists an extensive array of practices in local communities with a capacity to confer resilience in ecological systems<sup>1</sup>. Land use is the reflection of people's priority of spatial requirements and land base production processes, in relation to local institution, culture and natural adjustments with location specific situation, where Indigenous Knowledge of the people plays a critical role. Indigenous knowledge (IK) is the local knowledge, knowledge that is unique to a given culture or society. IK contrasts with the international knowledge system generated by universities, research institutions and private firms. It is the basis for local-level decision making in agriculture, health care, food preparation, education, natural-resource management,

and a host of other activities in rural communities<sup>2</sup>. This knowledge system is important intellectual resource to develop new developmental practices to achieve sustainability through the processes of management, conservation, bio-prospecting related activities with fair and equitable appropriate benefit sharing<sup>3</sup>. The *Tangsa Naga* and *Tungkhul Naga* are the two unique tribal groups of North East India living in two ecologically sensitive areas of Patkai Hills and Naga-Lusai hills of eastern Himalaya. These people design their practices and livelihood on an approach of Eco-system people which helps in nurturing the biodiversity and ecology of the respective areas. The present discussion will highlight these practices to show up the sustainability aspects there in.

### Objectives

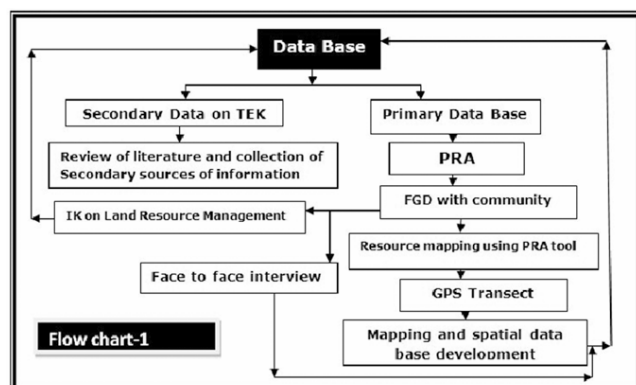
The study was carried out with following objectives:

1. To review the land and people relation among the Tangsa Naga and Tangkhul Naga,
2. To review their land resource management practices for credentials of the components of sustainability.

### Methodology

The data base of the study was developed through the phases of work as shown Flow chart.

\*Corresponding author



Flow chart—Methodological approaches

## Results and discussion:

### 1. Tangsa Naga of Patkai Hills

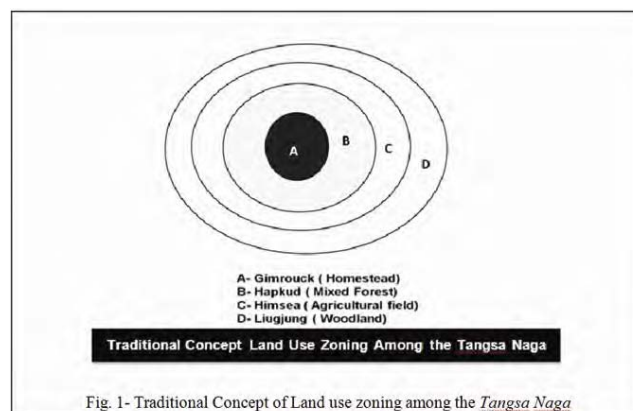
#### 1.1. Land and people

The term *Tangsa* is derived from 'Tang' (high land) and 'Cha' or 'Sa' (son) meaning sons of high land. The *Tangsas* are socially organised and hospitable. They live in 'Chang Ghar' (Platform house) made of wood, bamboo and *Jengpat* (Plum leaf). They have joint family system. Every Tangsa village has a headman called 'Keang Walang' who commands tremendous respect from villagers in every aspect of their lives.

*Tangsa Naga* is mainly inhabited in the northern part of *Dihing River* in the *Tirap Frontier* of *Patkai ranges*. In *Tangsa* villages houses are found in clustered on the central highland areas of the village, where houses are there with large homestead areas, near to this generally large patch of forest are found, which is with individual family's ownership and there is clear demarcation of boundary of each of the family's possessions. In the surrounding of this forest areas paddy fields are located.

#### 1.2. Practices of land resource management

The practices of land resource management of *Tangsa* are associated mainly with their spatial priority of land uses. The traditional land use concept was conceptualized as zones, where highland located in the center of the inhabiting space. It is used for residential purpose lay out with housing space and homestead garden locally called as 'Gimrouck'. This zone is surrounded by forest area (*Hapkud*) and after that agricultural fields (*Himsea*) are located. The boundaries are usually framed either by the forest (usually wood land locally called as *Lingjung*) or by the river (*Joujung*) or streams<sup>4</sup>. The Fig. 1 represents the ideal situation of land use pattern depicted by the people. In case of agricultural practices they use to

Fig. 1- Traditional Concept of Land use zoning among the *Tangsa Naga*Fig. 1—Traditional Concept of Land use zoning among the *Tangsa Naga*

practice summer paddy in the low laying areas locally called as 'Thun' and winter paddy cultivated in the high land called as 'Kongea'. In the traditional land ownership pattern, the *Gimrouck* (homestead) and *Himsea* (agricultural field) belongs to individual families and it is inherited by the sons. In many cases there are trends that daughter also get share of parental land. The *Hapkud* (mixed forest) are also belongs to individual but there are institutions framed by the community to maintain it. Usually owner's family as well as other villagers allowed to collect food, medicine or fuel wood (dry branches of trees are allowed). Timber poles are absolutely restricted to collect other than by the owner. It is noteworthy that on the death of family members some rituals are performed in this forest therefore, the mixed forest are considered as important space of taboo and respects to the *Tangsa*'s. The *Lingjung* (wood land) are the boundary or buffer to the village and the sacred space of 'Deep Puja' (a rituals performed in the month of April before starting of the agricultural activities). The locality of the wood land where sacred space is located with its neighboring area is considered as the sacred forest. The entire practices are entwined with their religious believes and cultural ethos through which they maintain an environmental ethics. The location specific description of the Kharang Kong village clarifies these practices more vividly.

#### 1.3. Location specific observation of land use practices from Kharang Kong

1.3.1. Location: Village Kharang Kong is located on the inter section of 95°48'20" E to 95°49'20" E longitude and 27°21'20"N to 27°22'20"N latitude. It belongs to Kumsai Panchayat and Margherita Development Block of Tinsukia District of Assam.

There are 28 household inhabited in the village with 128 population, who believes in Buddhism.

### 1.3.2. Spatial pattern of Land use

The existing pattern of land use of the village comprises of agricultural land, Community Conserved Forest (CCF), Village Forest (VF), Sacred Forest (SF), Homestead (HS), Fishery and Wetland (WL) (Table 1 and Fig. 2).

The land use data base reveals that about 15% of land area belongs to green coverage, 8.6% area belongs to water bodies and rest area is used for different

Table-1—Land use data base of Kharang Kong

Land use categories	Area (in hectares)
Agricultural land	1440.02
Community Forest	240.00
Village Forest	140.00
Sacred Forest	30.00
Homestead area	700.01
Fishery	1.00
Wetland	240.00
Total	2791.04

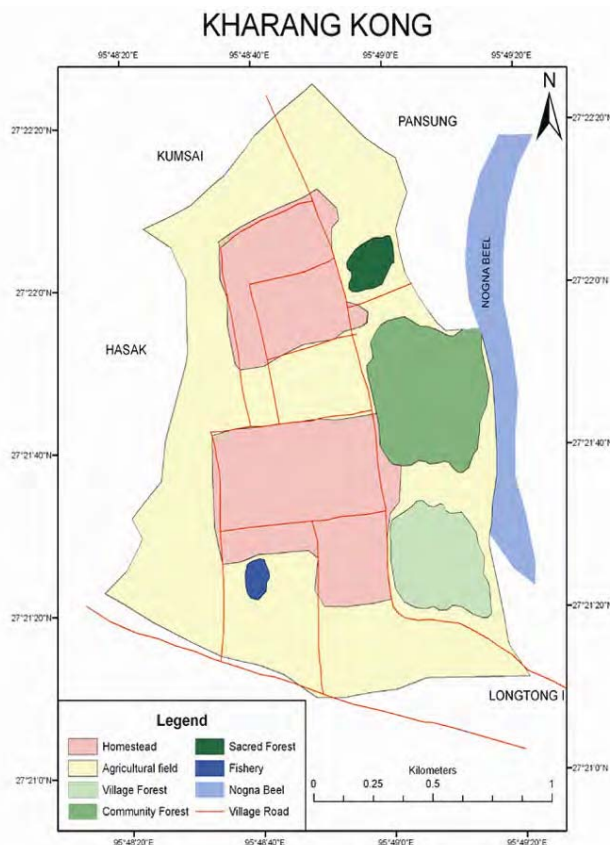


Fig. 2—Land use map of Kharang Kong village

production system (Fig. 3A). The transect profile of the area (Fig. 3B) shows the association of land use with the terrain condition, here CCF is located on the highest point and the wetland is located lower part of the area. Community Conserved Forest and Agricultural land on the terrain are sloping towards wetland helps to maintain watershed characteristics and helps to get sufficient water and litter washout of forest (which is full of organic matter) in agricultural field.

### 1.3.3. Agricultural & forestry practices and nurturing biodiversity

The agricultural practices of the *Tangsa* People inhabited in Kharang Kong include cultivation of rice and agro-forestry in the homestead. Major Rice variety cultivated in the area is mainly winter and summer rice. Common land races of rice cultivated in the areas are *Khuiji*, *Maitong*, *Sangkhaui*, *Hongpong*. In the homestead area commonly three different varieties Taro (viz. *Tuhai*, *Natunasi*, *Tuisu*) along with Tapioca (*Katungnai*), Sweet Potato (*Thasim*) are cultivated along with Palm Tree (Tikosung), Areca nut (*Tamulisi*) as boundary plantation. The

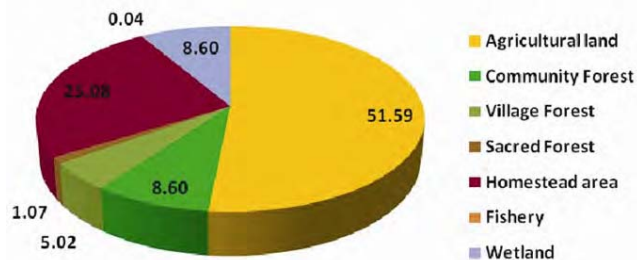


Fig. 3A—Land use pattern of Kharang Kong village

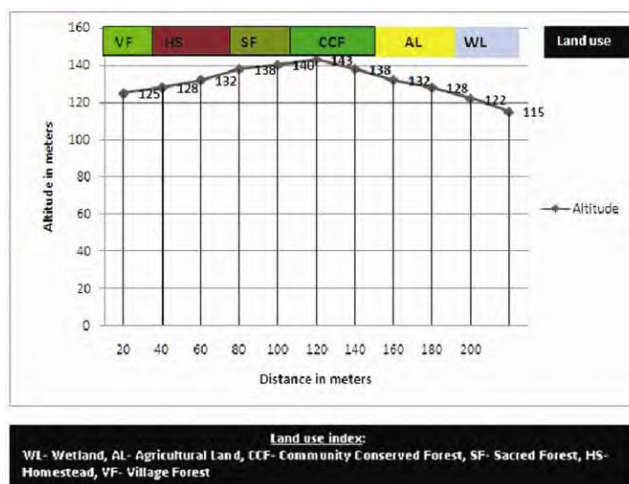


Fig. 3B—Transect profile of Kharang Kong village

community forest area is considered as Community Conserved Areas collection forest product from these patches of forest is restricted. On the other hand village forest provides the day to day material supports (as food, fodder, fuel and medicine) to the people. Usually varieties of edible mushroom, wild potatoes, herbs and fruits are collected by the people from village forest along with varieties of medicinal plants. However, in case of village forests, villagers can collect material only for self consumption not for sale. This institutions of restriction helps to nurture natural stock in the areas which also nurture other elements of nature, mainly wild animal (there are 98 varieties of common birds, 12 varieties of butterfly are documented in the village along with roaming ground of Leopard, Clouded Leopard, Marble Cat, Wild Pig, Porcupine, Wild Rabbit, Pangolin, Burking Deer, etc).

## 2. Tangkhul Naga of Naga –Lusai Hills

### 2.1. Land and people

*Tangkhul Nagas* are the inhabitants of Ukhrul District of Manipur. They are culturally rich and having a tradition of participatory natural resource management practices under collective ownership of 'Hanga' (village council) and clans. As a result of which there are collective decisions on land resource utilization as well as use natural resources, like water and forest mainly. Tangkhul practices of terracing are an age old one<sup>5</sup>. The inhabiting land of *Tangkhuls* is undulating terrain with altitudinal variation of 600 m to more than 10,000 m from MSL. On these undulating hilly ranges, there are mountains valleys; settlements are concentrated mainly on the valley areas. It also determines their different practices of Natural Resource Management including land resources. Out of total land areas approximately 16% area is cultivable, which includes terracing and jhuming<sup>6</sup> and rest is maintained as forest of different categories.

### 2.2. Practices of land resource management

The land ownership of the area is belongs to 'Hanga' (village council) managed by the 'Wungva-Wungva' (representatives of clan elders) and 'Awunga' (village chief). There are three pattern of land ownership /possession prevails among the Tangkhul, viz. Community land, Clan land and Individual land (under usufruct right). Community land and clan land are used under the decision of the village council, which is maintained as forest and some patches are use for *Jhuming*. The individual land is allotted by the

village council to the individual families for use only. It is mainly use for homestead and wet terrace. Usually they have the tradition of maintain following land use zones in a village, viz. *Naida Kaphung* (Community Forest), *Nadala* (Terrace Field), *Hala (Jhum)*, *Luir* ( Jhum Fallow), and *Kha* ( homestead). These practices from time immemorial support the livelihood of the people and help to maintain sustainability in the village specific situation.

### 2.3. Location specific observation in Kuingai village of Ukhrul

#### 2.3.1. Location

The village Kuingai is located on the intersection of 94°31'0" E to 94°33'30"E longitude and 25°20'0" N to 25°23'0"N latitude. It is located in the Chingai Development Block of Ukhrul district of Manipur. There are 90 household inhabited in the village with a population of 488. All the villagers believe in Christianity but till date they have some practices of nature worship out of their traditional believes.

#### 2.3.2. Spatial Pattern of Land use

The land use data base of the village represents mainly Community Conserved Forest, Mixed Forest, *Jhum*, *Jhum* Fallow, Terrace Field, Bamboo Plantation, Fish Pond and Water Springs. It is noteworthy that a large area of the village is under vegetation cover mainly under Community Conserved Forest and Mixed Forest followed by *Jhum* and *Jhum* Fallow (in combination), home stead area and Terrace Field (Table 2 and Fig. 4).

It is note worthy that more than 55% of the total geographical area of the village belongs to green covers, which is significant aspect of the existence biodiversity in the area (Fig. 5A).

The transact profile of the area indicates that highest altitudinal area of the village is covered by the community Conserved Forest (Fig. 5B) But it is followed by the *Jhum* and *Jhum* fallow. The practices

Table 2—Land use data base of Kuingai

Land use categories	Area in Hectares
Community Conserved Forest	447.78
Spring water along with water source	25.20
Bamboo plantation	87.25
Jhum	244.65
Abundant Jhum Area	160.95
Mixed Forest	797.85
Home stead area	224.16
Terrace field	184.92
Total area	2172.76



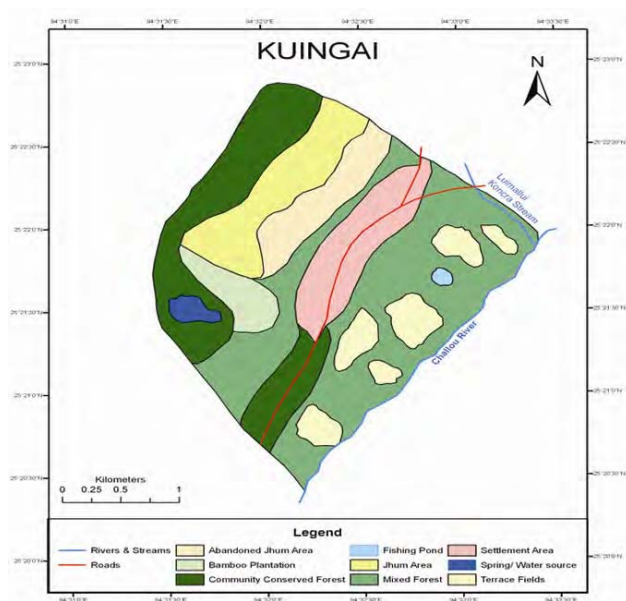


Fig. 4—Land use map of Kuingai village

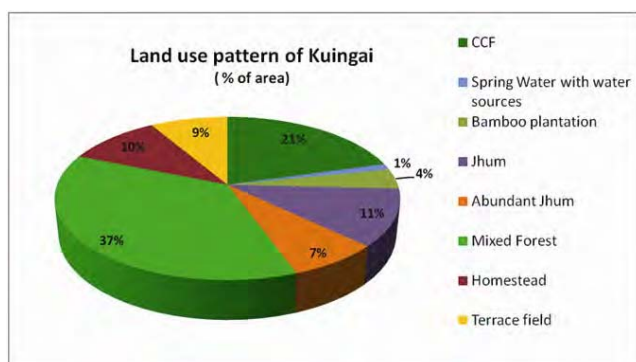


Fig. 5A—Land use pattern of Kuingai village

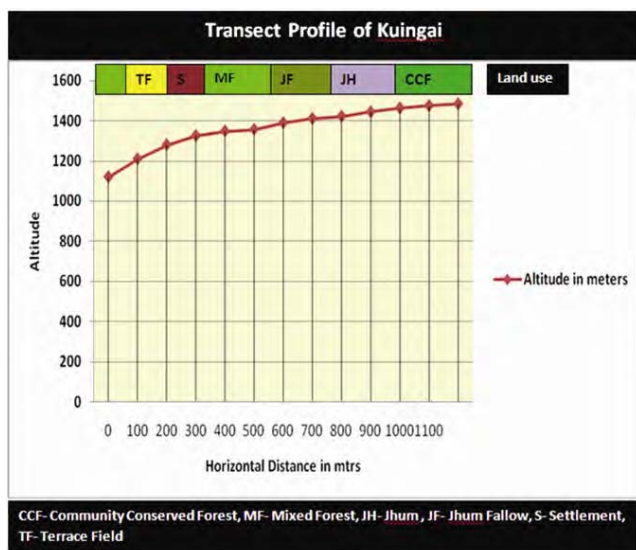


Fig. 5B—Transact profile of Kuingai village

of Jhum in the higher part of the region is a challenge to the sustainability of the land use practices. However, the settlement area (Home stead) are located between Mixed Forest and Terrace field.

### 2. 3.3. Agricultural & forestry practices and nurturing biodiversity

The agricultural practices of Tangkhul in Kuingai indicate rich tradition of agricultural bio-diversity. Rice is the main crops cultivated in the area, common land races of rice cultivated in the area are *Utapi*, *Thouren*, *Thaisa* and *Akhaupau* (all are *Jhum* Rice) and *Kasurktho*, *Agaphothu* and *Morekhu* (all are cultivated in wet terrace). Along with rice, Potato, Millet, Verities of bean, Taro, Brinjal, Chili, Zinger, Turmeric and other vegetables are cultivated in *Jhum*. There are practices of planting Rice Bean (locally called as *Monkey Rice*) and Adler species in jhum plot and in homestead areas, which helps in managing nitrogen balance of the soil. Forestry is a one of the major activities associated with the livelihood of the people. Usually Community Conserved Forest is a restricted area, no one is allowed to collect wood and other valuables from here, accept food, fodder and medicine for self consumption. But from village forest variety of product are collected and use by the people. The non-timber forest product collected from such forest are mushroom, different wild fruits, broom grass, honey, bea leaf, medicinal plants (like *Prosopis*, *Jinchung*, etc) along with verities of bamboo and cane. There are seven different verities of Banana grown here. The forest coverage helps to maintain the watershed characteristics such way which helps in developing Terrace field in down slope, which is a unique practice of the region. These nature way practices not only help to nurturing agricultural and floral biodiversity in the area, but it also helps to survive the wild life in the area. Mentionable wild animal usually sighted in the areas are Slow Loris, Hollock Gibon, Wild Bore, Leopard, Wild Pig, Burking and Spotted Deer, Wild Cat, Python and other verities of Snake, Jungle Turtle, etc. Only because of the larger coverage of vegetation it is not seavialrly impacted till date. But there are possibility for that. On the other hand location of mixed forest and terrace field in neighbourhood location helps in getting water sufficiently. It helps to drains the water over the slope in a better way and helps in distribution too.

### Summarization of the major observation

The Indigenous Knowledge System of both the *Tangsa Naga* and *Tungkhul Naga* people in the aspects

of land resource management indicates some uniqueness in the ownership pattern, sharing or distribution of resources, spatial arraignment and conventional ethics & institutions which reflects the practices of land ethics. Some of the significant observations are:

- The community base land ownership pattern is one of the important aspects which tied the community spirit of resource management to a greater extent.
- The traditional institution of village council (in case *Tangkhul Naga*) and village elders (in case of *Tangsa Naga*) plays a critical role in maintaining ethical use of land resources. It is basically controlled by the usufruct right.
- Low population pressure (0.0456 person/hectares in Kharang Kong and 0.2246 person/hectares in Kuingai) and per capita land availability (21.80 h in Kharang Kong and 4.45 h in Kuingai) are the important factors of significant forest coverage in the area, which helps to nurture wild life too.
- The traditional believes of the people, particularly the practices of worshiping nature {like believes on *Benchwo*–Jungle spirit among the Tangsa; the practices of '*Lui Kathui*' (awakening of field) by offering to '*Reisang Chonme*' (the creator) by invocation to *Ameowo* in the '*Luir Festival*' (seed showing festival) among the *Tungkhul Naga*} ethically entwined with the cultural ethos of the community which insist them to take care of nature.
- The transfer of land ownership under the usufruct right helps to maintain an equity and equality in there system of operation.
- The people's priority and food habits which are designed with availability of resources in their villages encourage them to maintain agro-biodiversity as well as develop their lifestyle as eco-system people.
- The geographical isolation of the places is also important reason behind the prevailing traditional practices among the people.
- Important aspects of IEKS in relation to land use is reflected in identification spatial location of use in relation to terrain condition, which helps to maintain land form stability, water supply and soil nutrient management mainly.

These practices are important in the context of sustainable land resource management. But there is need of protection of practicing people's Sui genre right. Therefore there is need to developing

People's Biodiversity Register (PBR) under National Biodiversity Act and developing of heritage register. Such approaches may helps to document their practices with protecting right under IPR regime and later on it can be adopted for reapplication.

### Conclusion

Land has been man's habitat and living space, a matter of life and death, of survival or starvation. To maintain the quality of land to achieve sustenance of its support system, concept of land resource management was evolved. This management practices incorporates the principles and techniques in the aspects of land uses, its quality management along with ownership regime and embedded with institutional practices there in. Leading principle of sustainability lies in the human endeavor which will ensure the "*intra and inter generational equality and equity*" in terms of sustenance of life and its supporting systems. In traditional society it is considered as one of the basic foundations for sustained way of life. It is disheveled with some management principle, devise on the people's long period of interaction with nature, which craft the foundation of Indigenous Ecological Knowledge System (IEKS).

The discussion portray the land use practices of two hill tribes of North-Eastern Region of India, which vividly indicates how these community crafted the cultural landscape through the processes of adjustment with natural conditions framed by geo-physical situation of the place. The crafting of these landscapes through land uses and associated decision making processes established the structure and functions from socio-economic perspectives, which nurtures cultural practices along with livelihood supports with nurturing bio-diversity. The sustainability components are embedded through the practices of conservation (viz. Community Conserved Forest, Village Forest, Sacred Space, etc) wise-use of natural resources ( by the way of topography and terrain based land use with priority on land cover management and maintenance of watershed principles) and nurtured agro-diversity. These are the inbuilt mechanisms of minimize the shock of seasonality and trend. Therefore, safeguarding of such natural and cultural dynamics of a cultural landscape is an important prerequisite of the hours to develop the foundation of sustainable development. Further studies in such perspectives covering other inhabiting community

may help to define and develop modalities of landscape management of the region.

### Acknowledgement

Authors indebted to Foundation for Social Transformation (FST), Guwahati, Assam for their support to conduct the study in Patkai areas among the Tangsa Naga; AFRO Task Force office of Guwahati and Ukhrul district Community Resource Management Society (UDCRMS), Ukhrul, Manipur for giving opportunity to carry out a study in Ukhrul area. We are grateful to Mr Lukam Tulum, Laten Tulum of Kharangkong for their constant help during the period of field study to communicate with the villagers in Kharang-Kong and Ms. L.W. Thingreiphi for helping in communication in Kuingai. We offer our heartiest thanks to Ms. K. Bordoloi of Guwahati and Mr Sasi Baruah, Mr Manjela Singpho and Mr Ghana Gagoi of Margherita; Miss Ranjita Baruah, Mr Dhruba Sharma of Guwahati and Mr T. Vashum of Ukhrul for their constant support and encouragement during the period of field study. We are indebted to village heads and communities of

Kharang Kong and Kuingai for their constant support and participation during the period of field study. We also offer our heartiest thanks to Ms Suranjana Borah for her support in cartographic works.

### References

- 1 Colding J, Floke C & Elmvist T, Social Institution in Ecosystem Management and Biodiversity Conservation, *Trop Ecol*, 44 (1) (2003) 25-41.
- 2 Warren D M, Using Indigenous Knowledge in Agricultural Development; World Bank Discussion Paper No.127. Washington, DC: The World Bank, 1991.
- 3 Damodaran A, Traditional Knowledge, Intellectual Property Rights and Biodiversity Conservation: Critical Issues and Key Challenges, *J Int Proper Right*, 13 (2008) 509-513.
- 4 Raghavan S, New Paradigm for Protecting Biodiversity, *J Int Proper Right*, 13(2008) 514-522.
- 5 Sarma Jayanta Kr, Documentation of best practices On Natural Resource Management among the tribes of Patkai Hills of Assam" (un-published study report-submitted to Foundation for Social Transformation: enabling north east India (FST), J. N Borooah Lane, Jorpukehuri, Guwahati-781001, Assam, India) , 34-35
- 6 Carely Bertram S & Tuck HN, "The Chin Hills" page-3, (reprinted 1983, Akash , N. Delhi), 1896.
- 7 Luikham R, *Tangkhu*: Traditional Land Use System and Related Custom" UDCRMS, 2006, 7.