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A People's Biodiversity Register (PBR) of Village Ghukhuyi, Zünheboto, Nagaland

The Energy and Resources Institute

...towards global sustainable development

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Chapter I: Introduction

India, a megadiverse country with only 2.4% of the world's land area, harbours 7-8% of all recorded species (MoEF, 2014). Of the 34 global biodiversity hotspots, four are present in India, represented by the Himalaya, the Western Ghats, the North-east, and the Nicobar Islands (MoEF, 2014). The North-Eastern Region which is a part of Indo-Burma global hotspot has at least 13,500 vascular plant species, of which about 7000 (52%) are endemic. The faunal diversity is equally high, and of the 430 mammals found in the Indo-Burma hotspot, 71 are endemic. Similarly, of the 1277 bird species found in the region, 74 are endemic to the hotspot. Other vertebrate groups show much higher levels of endemism, with 189 of the 519 reptile species and 139 of the 323 amphibian species being endemic to the hotspot. The hotspot also has a remarkable freshwater fish fauna, with 1,262 documented species, accounting for about 10 percent of the world total, including 566 endemics (Tordoff et.al. 2012). The northeast eco-region has 3,624 species of insects and 50 molluscs (MoEF, 2014). With all this natural wealth, the north-eastern region also leads in the total forest cover being 171964 sq km, which is 65.59 percent of its geographical area in comparison to the national forest cover of 21.34 percent (FSI, 2015).

The state of Nagaland harbours a total forest area of 12966 sq. km which accounts for 80.50% of the state's geographical area (FSI, 2015). Geo-morphologically, the terrain can be broadly grouped into four topographic units - alluvial plains (150 to 200 meters above m.s.l.), low to moderate linear hills (200 to 500 meters above m.s.l.), moderate hills (500 to 800 meters above m.s.l.) and high hills (800 meters and above). The main rivers that flow through the state are the Dhansiri, Doyang, Dikhu, Tizü and Melak.

Much of Nagaland's natural heritage is being rapidly eroded today. The implementation of the Nagaland Biological Diversity Rules (*NBDR, 2012*) framed in the local context has been an important step that takes into account customary laws and practices governing biodiversity, traditional knowledge and land tenure systems. The NBDR provides greater managerial control to the stakeholder communities to regulate local biodiversity assets and resources (NBDR, 2012). The rules respond to a number of emerging concerns, many of them the result of new developments in biotechnology and information technology. The rules safeguard the traditional ecological knowledge of the communities by ensuring proper documentation and by securing rights over associated intellectual property. Recently, with the help of NBDR, the Naga Mircha (*Capsicum chinense*) and the Nagaland Tree Tomato or Tamarillo *(Cyphomandra betacca)* has acquired the Geographical Indication (GI) tag[1] as directed by the Trade Related Aspects of Intellectual Property Rights (TRIPS) agreement[2].

The Nagaland Biological Diversity Rules also provide for the establishment of Biodiversity Management Committees whose main function is to prepare People's Biodiversity Registers in consultation with local people, and to submit the information to the State Biodiversity Board. These registers, "*contain comprehensive information on availability and knowledge of local biological resources, their medicinal or other use, or any other traditional knowledge associated with them"* (Gadgil et.al., 2005).

[1] A geographical indication (GI) is a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin.
[2] The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) is an international agreement administered by the World Trade Organization (WTO) that sets down minimum standards for many forms of intellectual property (IP) regulation as applied to nationals of other WTO Members.

In Nagaland, traditional conservation practices have helped protect biodiversity, and there are records of Community Conservation Areas being declared in the early 1800s, especially in response to forest degradation and loss of wildlife. However, with socio-political changes and development, traditional ecological knowledge is getting rapidly lost. Hence, it is necessary to document and preserve this rich ecological knowledge which can contribute to sustainable natural resource management in Nagaland.

The Energy and Resources Institute (TERI) supported by the Department of Forests, Ecology, Environment and Wildlife of Nagaland prepared Nagaland's first People's Biodiversity Register for the village Sukhai in Zunheboto district. This PBR is prepared on the request of neighbouring Sema villages under the GEF-Satoyama project funded by Conservation International Japan, and is part of a larger project to strengthen community conservation and link villages and their Community-Conserved Areas across the landscape. The local communities now manage their natural resources via the joint Tizu Biodiversity Conservation and Livelihoods Network (TBCLN).

This document records the biological and cultural resources of the village Ghukhuyi, located in the heart of Nagaland in Zunheboto district. The Ghukhuyi PBR documents its people's cultural connections with biodiversity, and is also an important element in the implementation of the Nagaland Biological Diversity Rules. The objectives of this study which are in tandem with those specified by the National Biodiversity Authority are to develop and maintain an inventory of known biological resources, and to document the traditional knowledge associated with biodiversity in Ghukhuyi. By doing so, local communities' knowledge about their biological heritage is registered and a commitment among them to conserve their rich traditions is fostered. The history of the Sema Nagas, the tribe inhabiting Ghukhuyi village, and their association with nature are highlighted. We have also documented the demography of the village, the different traditions and customs, art forms and festivals in the chapter on 'Peoplescapes', and have attempted to understand and to document the links of the culture and the economy of the Sema people with their local biodiversity.There is an urgent need to duplicate this activity in other parts of Nagaland as these registers are a repository of cultural traditions and folklore and help to codify knowledge that is fast disappearing. Additionally, these PBRs also serve as a reference point and template for various government departments including the forest department to refer to. They compile information on Indigenous Ecological Knowledge (IEK) in accordance with the PBR guidelines of the National Biodiversity Authority. Consequently, information compiled through this process of PBR creation could contribute substantially to an integrated Biodiversity Information System that would act as ta knowledge base for the implementation of the Biological Diversity Rules in Nagaland.

Apart from documenting the landscape and peoplescape of the area for posterity, the TERI team is working with the local community to strengthen community conservation. This includes assisting the local community of Ghukhuyi village to survey and demarcate the boundaries of their Community Conserved Area through GIS based maps, in identifying some of the flora and fauna present within the CCA and in training and capacity building for biodiversity documentation and ecotourism development.

Chapter II: Methodology

The Study Area

Ghukhuyi village is a part of the Joint Community Conservation Area named 'Tizu Valley Biodiversity Conservation and Livelihood Network' initiated under the GEF Satoyama project. It lies on the southern side of Zünheboto district bordering Phek district. The village is surrounded by Sataka block towards the west, Zünheboto block towards the North, Sekruzu block from Phek district towards South and Kiphri block towards the East (Image 1). Ghukhuyi is dominated by the *Sema* tribe. Ghukhuyi village lying in the heart of Nagaland has 8B/ C2 Khasi sub-tropical wet hill forest primarily overlapping with the 9/ C2 Assam sub-tropical pine forest, and is representative of the overall common flora and fauna of Nagaland state. There is 1 main river and 2 streams flowing by the village namely Tizu, Kutu and Yayi.

It acts as an important green corridor between the biodiversity rich forests of Satoi range and Ghosu bird sanctuary that harbor endangered and threatened species like the Blyth's Tragopan (*Tragopan blythii*), Fishing Cat (*Prionailurus viverrinus*) and Wild Dog (*Cuon alpinus*). Ghukhuyi village has undergone considerable transformation in the landscape, in its landuse and cropping patterns, its use of fishing methods and in its approach to conservation. The village council passed a notification in 2017 that puts a complete ban on hunting and fishing and felling of trees.

Image 1: A Google Earth view of Ghukhuyi village

Approach

Ghukhuyi CCA can be approached by road from Kiphri and Zünheboto which is the district headquarter, or from Satakha town. Distance to Ghukhuyi from Zunheboto and Sataka is 24 km and 12 km respectively.

Project Team

The study was led by researchers from TERI who formed teams with local community members to assess various thematic threads of the PBR. One team carried out vegetation sampling and survey of boundaries of the CCA, while the second undertook faunal surveys. The third team interacted with the local people to document traditional knowledge and practices. *Gaon Burrahs*[3] or the elderly people of the village provided insights on Ghukhuyi's rich traditional knowledge, folklore and culture. All pertinent possible secondary data such as topographic maps, aerial photographs, satellite imagery and information on the traditional history of the *Semas*[4], landuse and cropping patterns, rainfall and river flow statistics were collected from various sources.

Study Tools and Techniques

The following techniques were adopted for this PBR study:

1. **Interviews:** Information related to history of the village, local institutions and decision making, landscape aspects and biodiversity was collected from village chiefs and knowledgeable individuals, through personal interviews. Local communities were shown local field guides on various taxa (e.g. birds, mammals, butterflies and reptiles) and asked to list the species found in their village, their local names and uses and their current status. While the books on birds and mammals elicited the most interest, discussion, and responses from the people, they showed less interest in the smaller fauna, particularly butterflies and reptiles. For ascertaining scientific names standard field guides such as, 'A Companion to the Birds of Nagaland', authored by Grewal, Sen, Ramki and Haralu; 'Indian Mammals- A Field Guide' by Vivek Menon; 'Butterflies of the Garo Hills,' and 'Butterflies and Moths of Pakke Tiger Reserve' by Sondhi, Kunte and Captain and Whitaker's book on 'Snakes of India', were consulted (details in Literature Cited). Houses of hunters were also visited to observe their animal trophies, and these were added to the species lists of the village.
2. **Field visits:** Field visits were carried out with members of the village council and knowledgeable individuals to document the bio-resources of the village, and of the CCA. For faunal surveys, opportunistic documentation was carried out and species observed were recorded.
3. **Group discussions:** The investigating team conducted several group discussions with *Gaon Burrahs* and knowledgeable individuals. Discussions were mainly held to validate the information gathered at various levels (Image 3).
4. **Village Council Meetings:** A village council meeting was conducted at the village council hall involving all the stakeholders. The village council members and the village development board members were present at the meeting along with women group members. Village health workers, church members and other officials were also present during the meeting. This meeting helped to understand various issues pertaining to conservation of the community conserved area, and to identify possible solutions to tackle the problems.

[3] The village heads
[4] Ghukhuyi is a Sema village. See chapter 3

5. **Mapping:** Mapping of the village was done by the village people themselves. Different maps were drawn as a part of the exercise, and the best map depicting all the landmarks was selected (Image 2).

Image 2: Village mapping exercise with woman members

Image 3: Survey teams in discussion with community members

Chapter III: A Bit of History

***Another generation and hardly a memory will remain of the stories and songs which the Aos[5] have handed down from father to son for untold ages the past is being allowed to die. -* J. P Mills (1973).**

An introduction to the landscapes of the past

Understanding and documenting the current biodiversity practices of the Sema tribe of Ghukhuyi village needs to be contextualized in terms of their history. Their origin myths, folklore, migration pathways, traditional connections with nature and agricultural practices have over the years shaped their understanding of, and relationships with biodiversity and the natural world. At the same time, the cultural, political, religious and natural landscapes of the Sema community have not remained static but have been influenced by numerous changes happening around them. This has in some instances fragmented their traditional economic, religious and social systems and beliefs. In this chapter, therefore, a brief overview of the Sema tribe-available information on their origins and migration into the current area, their folklore and culture surrounding the natural world and the importance of their forms of agriculture to their lives and livelihoods is provided. The information in in this chapter is limited to ecological issues centering on nature and wildlife, agriculture and hunting given the nature of this biodiversity documentation. Changes in political systems have not been documented here, although most decisions concerning the land and the life of people are ultimately political in nature.

The picturesque Naga hills consisting of a crinkled landscape of hills and valleys through which streams and rivers meander, have changed over the years. Forests, for example according to records in the colonial period were teeming with wildlife. Grimwood mentioned in 1871 that it took them eight days to get from Kohima to Golaghat[6]. According to her,

We stayed two days at Kohima on our way to Jorehat, and travelled after leaving there through the Namba forest to the next station, called Golaghat. Bears, tigers, leopards, and elephants swarm in the jungle around, but one seldom sees anything more exciting than a harmless deer browsing by the wayside, or a troop of long-tailed monkeys crossing the road. It is all very wild and beautiful, and when we eventually came to the end of our eight days' march through the Namba, and reached cultivated regions once more, we were quite sorry.

Butler (1875) mentions the presence of even rhinoceros and wild buffalo in Nagaland, although rare and, "only to be met with in the Dhansiri valley". The forests were still unexplored and undocumented. Says Masters in 1844, "*I presume it would occupy an experienced Botanist 10 years to explore the whole of the Naga Hills, from the Booreedihing to the Dhunsiri, in a satisfactory manner; none of them having been hitherto visited by any Botanist"*[7].

Despite the still thick jungles during the colonial era, Naga settlements dotted the landscape and appear to have been clearly visible. The landscape was thus bold wild and agrarian in nature. According to Grimwood (1871),

[5] Replace Ao with Sema and the same would be true.
[6] In Assam
[7] The floristic diversity of Nagaland is still not well documented. There is still no published flora on Nagaland

Sometimes you find yourself riding along a narrow path which skirts round the side of a steep hill, while below you is the river, clear and blue and deep, with an occasional rapid disturbing the calm serenity of its flow. The hills around are studded with villages, and peopled by various tribes.

According to Godwin-Austen (1872)

Dense forest covers the slopes, but from their steepness many parts are bare, breaking the usual monotony of the dark-coloured mountain scenery. Where the steep rise in the slope commences, the spurs are at once more level, and are terraced for rice cultivation; not a square yard of available land has been left, and the system of irrigation canals is well laid out.

While some information is available on the Naga tribes from the colonial period (1832-1947), before this there is a vacuum for this part of the world. In this chapter, some of the ecological history of the Sema tribe, mostly from accounts written in the colonial period is collated.

Charting the origin of the Sema Nagas

Image 4: A group of men and women belonging to the Sema warrior tribe

In 1921, J. H. Hutton wrote a seminal ethnographic work on the Sema Nagas. Prior to this, there was little documented information on the Sema tribes. Interestingly, Elwin mentions that, "*It is curious that the large and important Sema tribe (which numbered 48,000 at the last census) should have attracted so little attention during the early period*." In Hutton's work he documents the origin, migration patterns, socio-economics, traditions, biodiversity use and folklore of the Sema Nagas. This remains the most authoritative description of the Sema Nagas. We have drawn upon this remarkable exposition to document the history of the Sema tribe in conjunction with other published literature and discussions held with the people of Sükhai, a Sema village which is one of the ancestral, 'parent' villages for the tribe in the Naga Hills.

According to Hutton (1921a), the Sema tribe was located to the north-east of the Angami country, and inhabited the valleys of three rivers; the Doyang (known as Tapu by the Semas), the Tizü and the Tita Rivers (Now called Tsutha River) as well as the mountain

ranges and plateaus that separate their waters. The closest relatives of the Sema Nagas, according to Hutton (1921a), are the Angami tribe and more specifically, the Kezami division of this tribe. The Sema language too is closely related to the Kezami Angamis, though it also resembles that of the Chekrama Angamis, since, according to Hutton (1921a), "a number of villages considered to be Chekrama are actually largely of Sema origin".

While tracing the origins of the Sema Nagas, Hutton (1921a), mentions that the Semas point south as the direction from which they came and,"relate the story of the Kezanenoma stone as well as many other folk-tales common to the Angami and Lotha, particularly the latter." According to the Kezanemoma legend, the ancestors of the Angamis, the Semas and the Lothas were brothers who lived with their parents in the Kezanemoma village in the Kheja area. They would spread paddy on a stone inhabited by a spirit who would make the paddy double by nightfall. Once the brothers had a bitter fight about whose turn it was to spread the paddy on the stone. The parents fearing that bloodshed would result spread eggs on the stone and set it on fire. The stone burst into pieces and the spirit departed. The brothers also departed in different directions giving rise to the three tribes (Hutton, 1921b).

According to another legend, sections of the Rengma, Sema and Lotha Nagas stayed below a township of Tsemenyu, where a stone slab to commemorate their stay still exists (Kumar, 2005). According to yet another story, Kepezoma and Kepepfuma, two divisions of the Angami descended from two brothers who emerged from the earth. The Angamis believe the prints of the hand and feet can be found near the hole where the brothers emerged (Hutton, 1921b). According to Hutton the Angami tribe (1921b), "pointed to Mao and the country beyond as the place of origin."

Hutton (1921a), in the Sema Nagas, however says that the Semas,

Do not, however, trace their origin south of Mao, but point to Tukahu (Japvo) as the place from which they sprang. The ancestors of the Semas came from that mountain, and the Sema villages spread, according to one account, from Swema or Semi, a village near Kezabama, which is to this day a Sema community retaining Sema as its domestic language, though it has adopted the Angami dress and is surrounded by Angami villages on all sides.

This version is corroborated by Davis (1891), according to whom,

The Semas say that they had their origin from the small village of Swemi, situated just north of Khizobami and about 30 miles east of Kohima. From Swerni they spread north and north-west until they occupied the country in which they now dwell.

Hutton (1921a), however, goes on to say,

Other versions, ignoring the Swema story, trace the wanderings of the Semas through different villages, some clans having come north through HebuHmi, Cheshahmi, and ChishiUmi, others through Mishilimi (" Terufima ") and Awohomi. The Semas of Lazemi tell of a great battle with the Angamis near Swema in which the Semas were defeated and retreated westwards until they reached the Zubza river; afterwards they turned northward to settle finally at Lazemi, MishiUmi, and Natsimi (" Cherama ") in the Doyang Valley.

Hutton (1921a), goes on to say, that these stories suggest that, "the Sema tribe occupied the land which is now occupied by the Tengima, Chekrama, and Kezama Angamis and migrated north under the pressure of Angamis coming from the southern side of the Barail range". Furthermore, all traditions agree in tracing the northward movement of the Semas up through the low hills of the Doyang Valley, from which the Sema tribed moved outwards.

Hutton (1921a), further hypothesizes that although the Semas share several affinities with the Kezami Angamis, the real origin of the Sema tribe was probably the country of the Khoirao tribe in Manipur State, who were sandwiched between the quasi-Agamis of Maram to the west, the Tangkhuls to the north and east and the Kacha Nagas and Kukis to the South (see Fig. 1). Hutton (1921a) mentions that the villages close to Maram were more similar in Angami culture than the villages further north which were more Sema in nature. The Tangkhul village of Chingjaroi is also called Swemi by the Angamis and lies North of Ngari, the northernmost village of the Khoirao tribe and according to Hutton (1921a), was probably, "another stage southwards in the migrations of the Sema tribe". These Khoirao villages also have the same name as Sema clans and give their origin as a place to the West, which according to Hutton (1921a), could be the Bodo tribes. He further draws out the similarity between these Bodo tribes and the Sema-in lycanthropy and tiger clans[8], in the Y shaped posts which the Garo, the Sema and the Kachari use, and in various linguistic similarities. Based on this evidence he concludes that the Semas are a composite tribe containing more Mongolian and Bodo blood from the north or north-west than their Angami neighbours.

The Sema village and culture

Irrespective of the exact origin of the Sema tribe, Hutton (1921a) provides a map of migratory routes that were given to him by the Sema community. This includes the village Kiyeshe, the current village under study. The village Kiyeshe was founded in 1810. According to Hutton (1921a), Sema villages frequently retain the name of the original chief, although village names may change when the old chief is succeeded by his son. This was corroborated in our discussions with the people of Kiyeshe (Sükhai). Traditionally in the Sema community, selection of chiefs is hereditary and the elder sons of the chief often leave to found their own villages while one of the younger sons succeeds the chief on his death in the ancestral village. According to Davis (1891),

These chiefs invariably have three or four wives, and usually large families. It is the custom for the sons as they grow up to start new villages on their own account. We thus find that, as a rule, Sema villages are small as compared with the villages of other Naga tribes.

The advantage of this formation of additional villages is likely to be manifold. First, this prevents in-fighting amongst the sons of the elder, each of whom can found a village named after him. Secondly, land is not divided amongst the sons in the village and so landholdings are not fragmented. And thirdly, because, the sons of the chief often fan out to form their own villages nearby, the 'parent' ancestral villages are often well-protected on all sides due to ties of kinship. This is important for warring tribes like the Sema and appears to be corroborated by the location of these Sema villages atop the summit of a hill or the shoulder of a spur probably to give them a vantage point from which they could get a bird's eye view of the approach of other warring tribes. The entire design of Sema villages appears to reflect their readiness for battle, important for a warrior tribe. For example, the Sema villages tend to be small (not more than 100 houses) and the cultivated fields close so that men could be easily assembled in case of a raid. The villages are also surrounded by jhum fields and low dense jungle in which movement by an enemy is difficult (Hutton, 1921a).

Davis (1981) has this to say about the Sema tribes' warrior status,

[8] See section later in this chapter which describes lycanthropy

The Semas are the most barbarous and savage tribes with which we have yet come into contact in these hills. But four years ago the custom of head taking was in full swing amongst all the villages to the east of the Doyang River, and the use of money was unknown to almost every village of the tribe.

While the Sema tribal identity is evident, according to Hutton (1921a), it is actually the village which forms the core of Sema society or part of the village which is under the control of a chief (*asah*). This is unlike other tribes such as the Angami where the clan predominates. This strong sense of village probably results from the presence of isolated Sema villages living in dense forests (Hutton, 1921a). The village Sükhai in particular is important since it is the progenitor of eight Sema villages some of which are also shown in Hutton's (1921a) map of migration. Another map dating back to the colonial period (Fig 1.) also indicates the location of several of these villages.

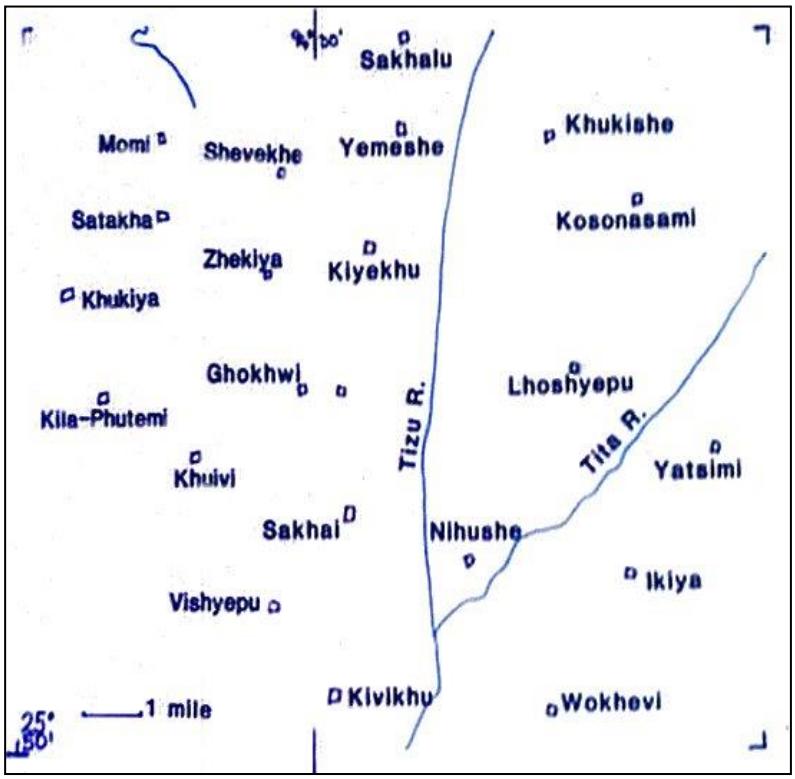


Figure 1: Map of Ghukhuyi and surrounding villages from the Colonial period

Source: http://himalaya.socanth.cam.ac.uk/collections/naga/record/r2659.html

Nature and the Sema Naga- Traditional Folklore

Traditionally, the Naga tribes had an intimate relationship with nature based on a foundation of the interconnectedness of God, people and nature. According to an ancient Chakhesang Naga myth[9], the Spirit, the tiger and a human lived together as a family till their mother died and became one with the earth. On her death, the human won a competition to stay in the village while the tiger who lost was asked by the Spirit to live in the jungle and take care of the birds and animals This story suggests that nature (represented by the tiger) and human beings belonged to the same family and lived in close harmony with God (the spirit) called *Alhou* by the Semas, and the Earth (represented by the

[9] According to the Mao Naga version of this tale (Mao, 2009), the mother was married to a cloud and had three sons, the Spirit, a human being and a tiger. The Sema Nagas also have a variation of this tale.

mother). Because their mother became one with the Earth, the Nagas consider all land to be sacred (Wezah and Casiño, 2010)[10].

Longchar (2007) narrates how a Naga views land

"The land is the Supreme Being's land"

"One cannot become rich by selling land"

"Do not be greedy for the land, if you want to live long"

"Land is life"

"The one who does not have land always cheats others or cannot become a good citizen"

"The land cries in the hands of greedy people"

"The land never lies; do not lie to the land"

"Anyone who takes another's land by giving false witness will not live long"

"The land is like a bird, it flies away soon in the hands of greedy people"

"You can sell other things, but not land"

"You are a stranger without land"

Jhuming or shifting cultivation[11] involves clearing the land and burning the jungle, so people propitiate the spirit with rice, crabs and rice beer to beg for forgiveness for the many animals, plants, birds and reptiles that might be inadvertently harmed (Longchar, 2000). Hence the clearing of forest or the killing of animals was not taken lightly by the Sema tribe given the kinship that exists between humans and all of nature.

Yiepetso Wezah (with Tereso C. Casiño) (2010) in a paper on the theology of nature narrates several other stories told by a Sema Naga elder, Ms. Wekhwezu-u Wezah that underline this connection between the Sema tribe and nature.

A boy and girl fell in love. They liked each other very much. However, as days passed another man began to like the girl but the man knew that she would not be able to separate herself from her boyfriend. Hence, he tried to trick her. One night he dressed like her boyfriend and came to her at night. He called her to come for a walk. They traveled a far distance without her noticing that the man was not her boyfriend, for he did not speak to her. At daybreak, she came to know that the man was not her boyfriend. So she insisted that she must immediately go back home. But the man told her that he was going to take her as his wife. So she began to run and the man killed her. The blood splashed on the tree and blood became an orchid flower. Her boyfriend found out that someone had taken his girlfriend away by force. He began to search for her. When he became too tired, he took rest under a tree. An orchid petal fell upon him. When he looked up, he found a beautiful orchid flower on a tree. He slept under the tree and in his dream, his girlfriend told him the whole story and how she became an orchid flower. She asked him not to pluck her but preserve her.

This fluid boundary between plants, animals and humans, and the ease with which humans are believed to transmute to other life forms is reflected in the commonly held belief amongst Ao and other Naga tribes that there are people with tiger souls. The Sema tribes are also believers in lycanthropy, where the souls of some individuals is believed to enter the bodies of leopards or tigers during sleep, although they do not physically transform into

[10] Narrated by Ms. Wekhwezu-u Wezah, who was 70 years old at the time of the interview in a Sumi Village in the Naga Hills, India, November 20, 2010 to Wezah (Wezah and Casiño, 2010)

[11] See next section

were-tigers or leopards. This belief possibly stems from the Naga origin myth described above where the tiger and human beings share the same ancestry. Tigers are rarely killed by Nagas and if this happens, they fill the tiger's mouth with water so that if the tiger utters the name of the man who killed him, the heavens would only hear gargling of water. Various rituals and *gennas*[12] are followed if this happens which are described subsequently. After death, however, the soul may transform into a hawk (kestrel) which then flies to the hill of the dead at Wokha or Naruto[13] (Hutton, 1921a).

Some of these stories underline the ecological role that animals play in the ecosystem and their contribution to 'ecosystem services' for human beings. For example, the role of the earthworm in enhancing soil fertility and the way this came about is described in the next folkloric tale

A cultivator began to cultivate his field, and his crops did not grow well. He was extremely worried that he might not have any harvest, and his family may face starvation. An earthworm noticed the sadness of the cultivator. So the earthworm came and asked the man, "What is the matter with you? I could see some problems in your face." The cultivator replied, "I am sad because soil is dry and my crops are not growing well." The earthworm replied, "Well, I could help you if we can agree (make a pact)." The man replied, "I would agree with you if you could help me." The earthworm said, "Do not hate (or despise) me. Do not crush me so that I will make your land fertile, and your crops will grow well." The cultivator replied, "Curse be upon me if I and my children despise you." From that time onward, the earthworm made the soil fertile.

The Sema Nagas understood the ecological value of diverse fauna, even rats considered by many other societies to be a pest species, and realised the need for co-existence with other species even if this meant sharing a portion of their harvests with other creatures.

Humanity had no rice to eat. Their food was not good. The rat noticed that mankind had a poor diet. One day, a man was searching for food. He saw a paddy plant in the middle of the sea. He thought that it could be good for food. However, he could not collect it. At that time, the rat came and told to the man that he could bring the paddy to him to sow and plant. Yet, the rat asked the man, "I will bring it for you, but I should also have my share to eat whether in the fields or at home from the barn. We should be good friends in the sharing of paddy. The man agreed and the rat brought the paddy from the sea. The man sowed the paddy and it produced a good crop Therefore, rats continued to have their share to eat in the fields and from the barns. It was believed that people should not curse or destroy the rat from eating the paddy.

According to Wekhwezu-u Wezah as cited in Wezah and Casiño (2010), even today, the people ask rats to protect their crops from grasshoppers and insects so that they have a plentiful harvest.

The Sema people's agricultural calendar was attuned to nature, guided by the movement of the stars or of birds-their migration patterns, breeding seasons and songs. For example, the sowing of paddy was initiated only when the constellation of Orion (*Phogwosiilesipfemi*) is at its zenith or after the *Kasupapo,* a species of cuckoo[14] was heard calling (Hutton 1921a) (Image 5). According to legend,

[12] Prohibitions and taboos. A term used and practiced widely amongst Naga tribes people

[13] Interestingly, Wokha is the site which is visited by about a million Amur falcons on their annual migration to Africa. One wonders if there is an association between the Sema belief and this annual migration of Amur falcons and for how long Wokha has been on the Amur's migration path.

[14] The Indian cuckoo (*Cuculus micropterus*) according to Hutton (1921a). The sowing of paddy appears to correspond with this bird's breeding season which though poorly known is probably April and June (Grimmett et al., 1998).

Image 5: Kasupapo or Indian Cuckoo at the advent of monsoon

The father of a man named Kasu, having died, appeared to his son in a dream and told him not to sow until he should come and call to him. Everyone else in the village sowed his seed and the seed sprouted and still Kasu heard nothing from his father, and the blades of corn grew up and still he heard nothing, and at last, when the rest of the crops were grown quite high, Kasu said, " My father has forgotten. If I do not sow now it will be too late." So he got ready his seed and started for his field. And as he went down the hill he heard his father calling loud and clear "Kasu pa po! Kasu pa po! "(= "Kasu, his father "), and then he knew that the time had indeed come, and sowed his seed gladly. And of al lthat village he was the only one that year who reaped a harvest, for the paddy of the others died in the ear, having been sown too soon. From that time forth the Semas have waited to sow paddy until they hear the Kasupapo.

Just like the cuckoo is considered to be an important indicator of monsoon, there is a story too, behind the crowing of the cock…. .

Long long ago, the sun was in the form of a boy and a girl. The natural temperature of the boy was very high but the girl had normal temperature. Owing to the high heat emitted from the boy, all the people got frustrated and killed him. Due to this, the girl became sad and stopped coming out. It became completely dark after that affecting the routine of the people. Enentually all the people pleaded the girl to appear and throw some light. They requested the wild boar, bear and lion to bring back the sun but all of them were unsuccessful. At the end, they sent the cock toask the boy to return. The cock requested the boy to please rise and expressed his sorrow that the people killed him. So the sun and the cock made a pact that whenever the sun rises, the cock would inform everyone by shouting in the morning, and evening looking in the direction of the sun. This is reason the cock still crows at sunrise and sunset.

Image 6: Crowing of the cock in Ghukhuyi village

Many of the Sema stories suggest that wild animals and plants colluded in mutually beneficial ways against human-beings who hunted them. Hutton (1921a) narrates a story of a mutualism[15] between the sambhar and the fish poison vine[16],

The sambhar and the fish wanted to become friends. So the sambhar said to the fish, "my friend, whenever men with dogs come hunting me, I shall come running down the stream. Do splash up the water and obscure my tracks". And the fish said to the sambhar, "my friend, men will strip the bark of the fish-poison vine and bring it to kill me. You too break down that vine with your horns." For this reason even today the Sambhar keeps breaking down the fish-poison vine.

Along with the stories of mutualism, there are also stories regarding competition and trust.

Long time ago, a squirrel and an Atsung were good friend. One day the Atsung got caught in a trap laid by humans. It requested the squirrel to help, so the squirrel immediately helped it by biting the trap with the help of its sharp and long teeth. After few days, the squirrel got stuck in the trap and requested Atsung to help it. But the Atsung couldn't help the squirrel as it didn't have any sharp teeth or claws. So eventually the squirrel died. The moral of the story is to choose your friends wisely.

These stories indicate the Sema Nagas' keen observation of nature and of ecological relationships including predation, competition and mutualism. Their observations and understanding of nature were, however, anthropomorphized in the form of folklore. Another story narrated by Hutton[17] explains how some birds came by their particular colouring[18].

When the earthcreepers[19] *and the birds went to war, the earth-creepers brought the Python as their leader and the birds brought the Hornbill and the Eagle. The Eagle said to the Great Pied Hornbill (Aghacho)-"you are the largest, go and bring the python". The hornbill said, "the python is bigger than I am, let the Autsa (the Rufous necked hornbill) go". But the Autsa also refused. Then the Eagle said he would go. When the Eagle vanquished the snake, he brought it back and the birds divided the*

[15] Mutualism in ecology denotes a relationship in which both partners benefit, i.e. two species have a mutually beneficial relationship as long as the benefits outweigh the cost.
[16] We have paraphrased this story.
[17] The Sema Nagas has a number of animal folktales narrated by Hutton (1921a)-we have only reproduced a few here
[18] Only part of the tale has been narrated here and has been paraphrased
[19] Lizards and other reptiles

flesh amongst themselves. The crow (Agha) rubbed himself in the gall and became black. The minivet (Chilichepu-Scarlet Minivet), rubbed himself in the blood and turned red. However, the rubythroat (Izhyu) was late and all that was left for him was a bit of blood. He smeared his chin in the blood and that is why he has a ruby throat.

The Naga tribes had several taboos and traditions to regulate hunting of species during certain seasons. For example, hunting of some species during the breeding season such as hornbills was not allowed. Although, we did not come across any such stories from the Sema Nagas, the following tale from a Chakesang village suggests that hunting hornbills during the breeding season was discouraged through such stories[20].

Two young men fell in love with one girl. One day they went in search of a hornbill nest, which is located on top of a tree. They made bamboo steps and climbed up. One man was very deceitful; when his friend climbed to the top, he climbed down. He cut the bamboo ladder and went home. His friend was left behind on top of the tree. He could not come down. So he began to eat the fruits brought by the mother of a hornbill for her little ones. He wanted to come down. He began to construct wings with the feathers and tails from the young hornbills. The mother of the chicks told him not to cut the feathers of her young ones; she said that she would bring him down to the ground. Then a huge flock of hornbills came, and slowly took him down to the ground. The man was so thankful to the hornbills.

Amongst some Naga tribes, killing of pregnant animals and birds was a taboo that would bring misfortune to the hunter and his family. Fishing and the use of certain poisonous roots and leaves that kill fishes in the rivers or springs during the spawning season were also restricted (Lanusashi Lkr and Martemjen, 2014).

According to Hutton (1921a), however, "*The Sema observes no close seasons for game (except when made to do so), but hunting with dogs on an extensive scale usually stops towards the end of May, because it is apt after that to damage the young corn. Hunting is in full swing again after the harvest is in."* The Sema Nagas, however had several gennas and taboos for the killing of certain game; or example, whoever killed a tiger had to remain chaste for six days. *While on the first day he could not eat rice, for the remaining six days he could not eat vegetables except chillies nor any meat except pork and had to sleep away from home on a bed of split bamboo to prevent sound sleep, lest the spirit of the slain beast attack him. In some tribes such as the Changs this genna is observed for thirty days* (Hutton 1921a). Various animals were not eaten including several birds for many reasons[21]. In addition, amongst Semas, those who killed a tiger or leopard have to abstain from eating plants called *chiiye, ashebaghiye, tsughukutsiye, or aghiye.*

All these taboos and practices amongst Naga tribe's people encouraged wise-use of plants and animals that helped them maintain viable populations. The underlying principle of sustainable utilization appeared to embody interactions between people and nature in the past. Killing was not taken lightly. In recent years, however, this fragile balance appears to have broken down in many places in part because of changes in religion and culture. Consequently, hunting in Nagaland is now widespread and wise-use practices eschewing hunting during the breeding season are largely non-existent. Nevertheless, as described in a later section, initiatives are being taken across the State, including Ghukhuyi village to promote conservation and a revival, albeit incipient appears to have begun in the State.

That folklore is deeply embedded in the culture and practices of the local Sema Nagas even today, however, was very evident in our interaction with the people of Ghukhuyi village.

[20] Meselhitsu-u Khalo, story narrated in Chakesang village, Nagaland, India, December 22, 2010 (as cited in Wezah and Casiño, 2010)

[21] See chapter on hunting practices and traditions.

The Gaon Burrahs, for example, narrated many stories of how birds came by their size, shape and colours.

a) Mighaw or the leaf bird was good at imitating other birds. He could sing and imitate almost every other bird of which he was very proud. Full of pride, one day he decided to imitate the call of a mighty Mithun. While doing so his chest burst because of pressure. Hence since that day, Mighaw or the leaf bird lacks a big breast area unlike other birds.

Image 7: Mighaw or Leaf birds

b) One day a fight rose between the python and the mighty eagle for the supremacy of earth. The python representing the legless animals and the eagle representing the winged ones fought fiercely drawing each other's blood. After a long fight, the eagle finally killed the python. As per the custom, meat was cut and shared between all winged animals. Ijiu or the sunbird was the last to reach the place. However, by this time all the meat portions were over. He had to satisfy himself by drinking blood of which 2-3 drops remained near his neck making it permanently crimson. Hence, Ijiu meaning the last one has a red or crimson neck.

Image 8: Ijiu or Crimson Sunbird

c) There was once a bachelor who lived alone in a village. He had a big pond in front of his house which was used by all. Once a fairy came to the pond at the dawn to take a bath but she made the entire pond dirty. Others who came to the pond got angry and complained to the bachelor. The batchelor kept watch to find the culprit and found the fairy making it dirty the next day. He hid the headgear she used to fly. Unable to fly, the fairy was stranded at the pond. The bachelor asked her to marry him after which he promised to return her headgear. But he did not keep his promise after marriage and they continued to live together. Soon after, they had a child. The fairy desperate to return asked her child to spy on her father to find the location of the headgear. Once the child found the headgear for her mother while her father was away, the fairy decided to leave. But the child pleaded to take her along. Since the child could not fly the fairy had to tie her with a rope to her so that she could float too. But on the way to fairy land, a raven cut the rope unknowingly. The child fell to the ground and died. The fairy realised her child had fallen and saw the raven feasting on the dead body. She cursed him and left out of sorrow. Paying no heed to her, as soon as the raven ate the liver of the child he turned completely black. Since then the raven or the crow is black in colour.

d) Earlier there were very long days and nights. So the people requested the Owl to talk with the day and the night. On discussion, the Owl came to the conclusion that for one year there would be total day and the next year complete night. Disagreeing with this proposition, all the people started beating the Owl on the back of his head which flattened his head from the back. Then the people requested a small bird to talk to the day and the night. It requested the day and the night both to come early which would help people in their day to day activities. The day and the night both agreed eventually and started coming early which helped all the people. All the people were happy and started patting the bird. Due to constant patting the bird became short in size and its head became smooth.

Farming in the Forest

The Sema tribe depends on jhuming or shifting cultivation as the mainstay of their diet supplemented by hunting. So dependent are the Sema tribes on their land and forests that their folklore, traditions, *gennas*, taboos and indeed entire lives revolve around this traditional practice of jhuming. Hutton (1921) puts it succinctly.

His[22] *life is one perpetual struggle for an existence in which one year's crop is rarely enough to last him in even comparative comfort till the next harvest. Before he has reaped the whole of that harvest he is already at work clearing the new jhums for the following year. If he leaves his fields alone at all it is only to raid, to hunt, to observe a genna, or to go away to work for just long enough to earn the two rupees which he must pay to Government as house tax.* Given the widespread portrayal of jhum cultivation in a negative light as the primary source of forest degradation due to ever decreasing jhum cycles, the following comment by H. H. Godwin-Austen (1982)[23] on the quality of rice obtained from jhum fields in Nagaland is refreshing.

[22] The Sema
[23] Cited in Elwin (1969)

While on the subject of rice, I may mention that the kind grown by the Kukis is remarkably fine and nutritious, no doubt due to their system of joom cultivation, the crop being taken year after year off virgin soil.

Photo 10 Maize being grown after slash and burn of forests

Governance of Sema lands

For the Sema tribal, the forests were his farms and hence from his perspective land and forests were inseparable. The forests formed the mainstay of the economy as well as an integral part of the social and cultural fabric of Sema life. The ownership and governance of forests[24] is largely communal in nature in Nagaland and governed by customary practices which, however, deviate substantially from tribe to tribe. As Verrier Elwin (1969) puts it so succinctly, "*Naga society presented a varied pattern of near-dictatorship and extreme democracy*." The Semas along with the Konyaks and Changs, for example have completely different land ownership patterns from other Naga tribes. While in the Ao tribe the village people play an active role in governance and chieftanship is not hereditary but by a council of elders representing clans and family groups of the village (Jamir), amongst, the Semas, Konyaks and Changs, however, ownership of land vests with the village chief (Akukao). The chief controls the land and hence all power and privileges lie with him. The chief decides who gets a piece of land (forest) to farm based on the needs of each member of the village community. Davis in 1891 has this to say about his hereditary system of chieftanship,

These chiefs have many privileges, i.e. their subjects cut their jhums and cultivate them for them for nothing; they get a portion of every animal killed in the chase, and generally are in a position far superior to that of an ordinary Naga headman.

Some percentage of land is privately owned but which varies from village to village. George and Yhome (2008) give an account of some Sema villages and their land governance practices. In Lumami village for example, while the Chief owns 60% of the land the remaining is owned by a few individuals depending on the 'khels' who formed the village along with the then Akukao. Consequently, the majority of the people are landless, and the

[24] We use land and forests interchangeably

Chief allocates portions of his land to them each year. In this paternalistic system, the people give the chief a part of their produce and call him 'father.' Every year the chief and his council decide the site of cultivation in the forest. In return for his largesse, the chief is entitled to free labour twelve times each year from the village community. There are other examples of Sema villages in which land is entirely owned by individuals (George and Yhome, 2008). The landless villagers in Awotsakilimi for example are again completely dependent on the Akukao who owns most of the land. In Sutemi village too, land ownership is by individuals, mostly the Akukao and those who first settled in the village. These examples suggest the relatively feudal system of land management amongst the Sema tribe and the enormous influence wielded by the chief of a Sema village.

In 1978, the Nagaland Government passed the Nagaland Village and Area Council Act which called for the creation of a Village Council in each village. However, this Act allows the village councils to select their members based on their own customary traditions and practices and thus fosters the continuation of existing governance and management norms. In the case of Sema villages, the village council makes all the decisions on where cultivation is allowed and violators are sanctioned. The village council also has the power to supersede individual property rights and impose restrictions on village members (George and Yhome, 2008), for example in terms of cutting for firewood.

Practice of shifting cultivation in Sema villages

In the Sema practice of shifting cultivation (jhuming), the people clear the land (forest) which is cultivated for two successive seasons after which it is allowed to revert to forest for a number of years. The land was farmed for only two seasons, because as Masters (1844) put it,

After the Naga has cultivated a piece of ground two years, and often one year only, he finds it so full of weeds, especially of the Compositae and Labiatae[25] *families, that it is not worth his while to sow it again and he clears fresh jungle accordingly*.

The exact cycle depends on the amount of land available. Increasingly, jhuming cycles are shortening as populations increase and forest land is scarce. Amongst Sema tribals, fifteen to twenty years was considered to be ideal, though seven to nine years is considered to be the shortest time in which the land is fit for cultivation (Hutton 1921a, discussions with village people). In particular land near the village tends to be left for the shortest time, since it is the easiest to cultivate (Hutton 1921a). Shortening jhum cycles are not a new practice, however. Almost 100 years ago, Hutton (1921a) has this to say about the length of the cycle.

In the Tizü valley, however, and in parts of Kileki valley where the population has much outgrown the supply of suitable jhuming land, jhums may often be found cleared after only five years' rest, and in some villages even after three, while loads of earth have to be sometimes actually carried and dumped down in the rocky parts of the field to make sowing possible at all.

[25] Asteraceae

Unlike other tribes, the Sema tribes do not burn and then clear the land. Instead, they first fell much of the forest and then burn (Hutton, 1921a). This practice also probably provides them with ample wood for firewood, construction and for sale (Image 9). Hutton (1921a) provides a detailed list of crops planted in the jhum cycle; however the major ones are rice, Job's tears (*Coix lacryma-jobi*) and millet along with many other secondary crops.

Image 9: Fresh Jhum area in Ghukhuyi village

The jhum cycle starts in November when the clearing of old jhums is carried out by the women for resowing. Simultaneously, the men clear new land for the new jhum. Seeds are not broadcast but are inserted into little hollows created with a digging hoe (*Akupu*) by the men and then scraped over with a hoe of bamboo or bamboo and iron (*Akuivo*) by the women. Harvesting is done from September to November depending on the climate. Stripping of the grain is done by hand. The local communities told Hutton (1921a) that this painful method of stripping by hand, not practiced amongst other tribes is because, "*long ago, when the Semas reaped with daos, a man slashed open his stomach and so died."*

Although jhuming continues to be the main method of farming in Nagaland, some recent evidence suggests a decline in jhuming patterns as people shift to other avenues of employment. In the case of Ghukhuyi, many of the villagers have moved out to different towns and cities. Population size of the village is dwindling as people move out; hence smaller jhumed areas are probably sufficient for meeting people's agricultural needs.

Interestingly this reduction in area under cultivation is contrary to what Davis predicted in 1891, although he predicted a shift from jhuming to rice cultivation. According to him, "*the Semas are to all appearance a rapidly increasing tribe. They have, within the last 30 or 40 years, occupied the whole of the Tizü valley and a portion of the Tita valley, and have ousted the Aos from the sites on which now stand the Sema villages of Lopphemi and Limitsimi. They are now getting considerably pressed for land, and as they can extend no further to the north, south, or west, and not much further to east, it appears to be merely a question of time before they are obliged to adopt the terraced system of rice cultivation. This system, together with the Angami dress, has already been adopted by the seven or eight Sema villages situated near the Eastern Angami villages of Zogazumi and Pholami*."

Reviving conservation in Nagaland- the modern rationale

As described earlier, community ownership and management of land is the norm amongst most tribes in Nagaland and forest lands are communally owned. Of the recorded forest areas as much as 8,628 sq. km falls under Unclassed Forests or 93.5% of the recorded area (FSI, 2013) which are owned and managed by individuals, clans, village and district councils and other traditional communities. These traditional and customary rights of people in the North East are protected through the sixth schedule of the Indian Constitution, under which in many States, Autonomous District Councils have been constituted where tribal councils have legislative, administrative and financial powers over 40 subjects including forests (Chatterjee *et al*.). In Nagaland, customary rights are protected under Article 371 A of the constitution (see Box 1), and while no autonomous councils exist each village has a village council (Jamir, Undated). Hence customary land ownership and management practices characterize forest management in the North East including Nagaland.

Box 1 Article 371 A of the Indian Constitution

Article 371 A: Special provision with respect to the State of Nagaland

Notwithstanding anything in this Constitution, no Act of Parliament in respect of:

- Religious or social practices of Nagas
- Naga customary law and procedure
- Administration of civil and criminal justice involving decisions according to Naga customary law, and
- Ownership and transfer of land and its resources, shall apply to the State of Nagaland unless the Legislative Assembly of Nagaland by a resolution so decides.

As mentioned earlier each tribe including the Sema tribes had their own conservation ethic and taboos and practices that encouraged the wise-use of nature. Changes in culture, religion and exposure to the outside world have over the years led to an erosion of many of these practices. The influx of guns, has further transformed low-intensity hunting using indigenous traps and snares. The culturally important hornbill has all but disappeared from much of the State and hunting is now rampant and indiscriminate. Nevertheless, the state continues to support significant floristic and faunal diversity, and there is little doubt that In Nagaland, these traditional conservation practices along with low levels of population and development have helped to protect biodiversity. Moreover, there appears to be a revival of interest in protecting communally-managed areas for conservation across the State some of which date back to the late 1800s. For example, there are records of Community Conservation Areas (CCAs) being declared in the early 1800s, especially in response to forest degradation and loss of wildlife. In 1842, the tropical evergreen forests of Yingnyu shang were declared a Community Conservation Area by the Yongphang village in Longleng district. Today, there are reported to be 765 Community Conservation Areas in the five eastern districts of Nagaland, Mon, Longleng, Tuensange, Kiphere and Phek. In Tuensang district alone, as many as 104 of these areas have been declared along with self-imposed bans on hunting imposed by village councils

ICCAs, i.e. Indigenous or Community Conserved Areas are areas that are governed by local communities, tribes or indigenous people that lead to conservation of cultural traditions and biodiversity. CCAs may represent the continuation of traditional conservation practices or ones where ancient practices have been revived, modified or even newly created to protect

nature and address threats to natural ecosystems and cultural values through changing socio-cultural, economic, developmental imperatives and mores and unsustainable resource extraction practices-e.g. hunting and poaching or shifting cultivation practices on a reduced fallow cycle. Both exogenous and endogenous factors may exert an influence on cultural and resource conservation practices and work alone or in tandem to strengthen or weaken these CCAs.

Motivations for the creation of these CCAs vary. In 1983, in a Chakhesang tribal settlement called Lozaphuhu, the local student's union (LSU), conserved a 5 sq. km of forest in order to protect water sources. Later in 1990, they added an additional patch of forest below the main village, as a wildlife reserve, with a total ban on hunting and resource use (Pathak and Kothari, 2005) the Chakhesang Public Organisation (CPO) consisting of 80 villages in Phek district imposed seasonal hunting bans and protected the forests against forest fires. The recent ban on the hunting of Amur falcons when they make their annual stop at Doyang same in Wokha district during their migration from Mongolia to South Africa is a fine example of efforts by various individuals, organizations and the forest department along with local communities to stop the slaughter of these birds. In the case of Khonoma, in 1993, 300 Blyth's tragopans were killed which led to some individuals in the village vowing to impose hunting bans (Pathak and Kothari), particularly since the forests were already reeling from timber harvests. In 1998, the Khonoma village council decided to notify about 20 sq km as the Khonoma Nature Conservation and Tragopan Sanctuary (KNCTS). Hunting was banned in the village and resource used stopped in the core of the sanctuary. Recently, however due to increasing human-animal conflicts, the ban on hunting has been partially lifted. Sendenyu, is an example of a CCA created by a few members of the village who were government officials and although hunters were concerned about dwindling wildlife in their area (Pathak and Kothari). While the Khonoma and Sendenyu examples are well known, many relatively undocumented examples of community conservation exist. In Thetsumi village for example, the people have kept aside 7 sq. km of area including 800 ha of formerly jhumed areas as a Mithun forest for the breeding of Mithuns (Banerjee, 2014).

In the case of Zünheboto district, community conservation activities have been in existence for almost two decades. The people of Chishlimi village in 1995 banned hunting in a designated forest area and stopped the use of explosives to catch fish in the Tapu River to help fish populations recover. Villagers continue to hunt in areas outside the reserve. However, if the animal enters the reserve then it cannot be hunted. In addition, hunting through ambush has been banned in the entire village. The Ghosu Bird Sanctuary in Ghukiye (Gukhui) of Zünheboto was also one of the first community protected areas to be declared. According to Pathak and Kothari (2005), "Ghukhuyi and five neighbouring villages are also regulating fishing in their river, by banning use of explosives, chemicals and electricity. Another 11 villages under Satoi area in Zünheboto have converged to conserve roughly 50 sq km of forest area, while 14 villages have come together to create the Nanga Greener Zone. Ghukhuyi village of Zünheboto which lays close to various biodiversity rich areas including Ghosu Bird Sanctuary and the Satoi range, have also declared a Community Conserved Area and are in the process of declaring an additional area for conservation[26]. In the case of Sükhai village, a number of reasons are behind the community's decision to conserve the area. The decreasing need for jhum land has been mentioned earlier. In addition, the local people want this area to become an important center of ecotourism and hope that this CCA will in the long run help generate local livelihoods from ecotourism including bird and wildlife watching.

[26] See Chapter 6 for additional details.

As described above the modern rationale for conservation in Nagaland are many, and can be driven by resource scarcities, declining wildlife populations, the need to generate alternative livelihoods for example through the rearing of Mithun or ecotourism. Irrespective of the exact motivations, conservation of biodiversity is reviving in the State of Nagaland.

Chapter IV: Peoplescape

Introduction

The 'P' i.e. 'People' in the PBR indicates that the PBR activity is people-centric. As a first step to the development of a PBR, it is important to document the people of the locality, their relationships with biodiversity, and variations in the nature of this interaction. This chapter attempts to provide an account of Ghukhuyi village, with respect to Ghukhuyi's natural resource, its people and interactions between the two. The findings represent the perceptions of the people themselves, and their responses and viewpoints to the questions posed by the TERI team.

It is the local communities who over hundreds of years have shaped this region's belief systems. In turn, it is the rich and varied biodiversity that has imbued every aspect of the perceptions, cultural and economic practices of the Sema community, and their well-being. Therefore, this chapter attempts to capture the present day practices of the Sema people of Gukhuyi village but in light of their past history, traditions and beliefs and their use of, and relationship to, nature.

Methodology

To capture the essence of the 'P' of a PBR, participatory techniques such as transect walks, resource mapping, and social mapping were adopted. Participatory approaches are based on an assumption that people have an intuitive picture and knowledge of their surroundings, and hence involve a series of group discussions. Corresponding to each technique adopted by the survey team, formats for documentation, namely, village profiles, resources mapping and social mapping were developed and applied (refer to Annexure 1 to 3 for details). The following paragraphs provide details of methods adopted for data collection.

Transect Walk

Materials - pen and paper

Objective – To learn more details about the village – location and boundary of the village, important roads, location of main village, location of jhum land, clans residing within the village, primary occupation, etc.

Method - A transect walk is conducted by walking systematically along a defined path (transect) across the village together with the local people observing, asking, listening and looking (Refer to Appendix 1 for the village profile format).

Resource Mapping

Materials - Large sheet of paper, pencils and color markers.

Objective –To learn about villagers' perceptions of natural resources found in the village and how they are used.

Steps

1. Participants were asked to draw boundaries, demarcating important roads in, and around, the village.

2. Participants were then asked to draw important landmarks within the village, such as the church, tourist guest house, jhum land and sources of water.
3. After the participants finished drawing the resource map, they were asked to describe the map.
4. Discussion on important resources such as jhum land and forests, sources of water, education and health facilities, were initiated with the participants. The discussion was recorded in the format provided in appendix 2.

Social Mapping

Materials - Large sheet of paper, pencils and color markers.

Objective – To understand the social composition of Ghukhuyi

Steps

1. Firstly, participants were asked to draw a map of the village, showing boundaries and important landmarks such as *Khels*, churches, ponds etc.
2. The participants were then asked to draw all the households within the village on the map.
3. Participants were asked to list details of each household – clan they belong to, number of households, gender composition, age composition, and number of migrant members. (Refer to appendix 3 for social mapping format)

Findings

Location of Ghukhuyi village

Ghukhuyi village is situated in Satakha Block of Zunheboto district, Nagaland. It is 16 Km from Satakha town along the Satakha- Satoi highway, 20 Km from Zunheboto town and 136 Km from Kohima, the State capital of Nagaland. The villages bordering Ghukhuyi are Hoshepu, Qhekiye, Qhehoto and Nihoshe in the East. Kiyekhu and Zhekhiye lies to the North, Sukhai village to South and Xuivi in the West.

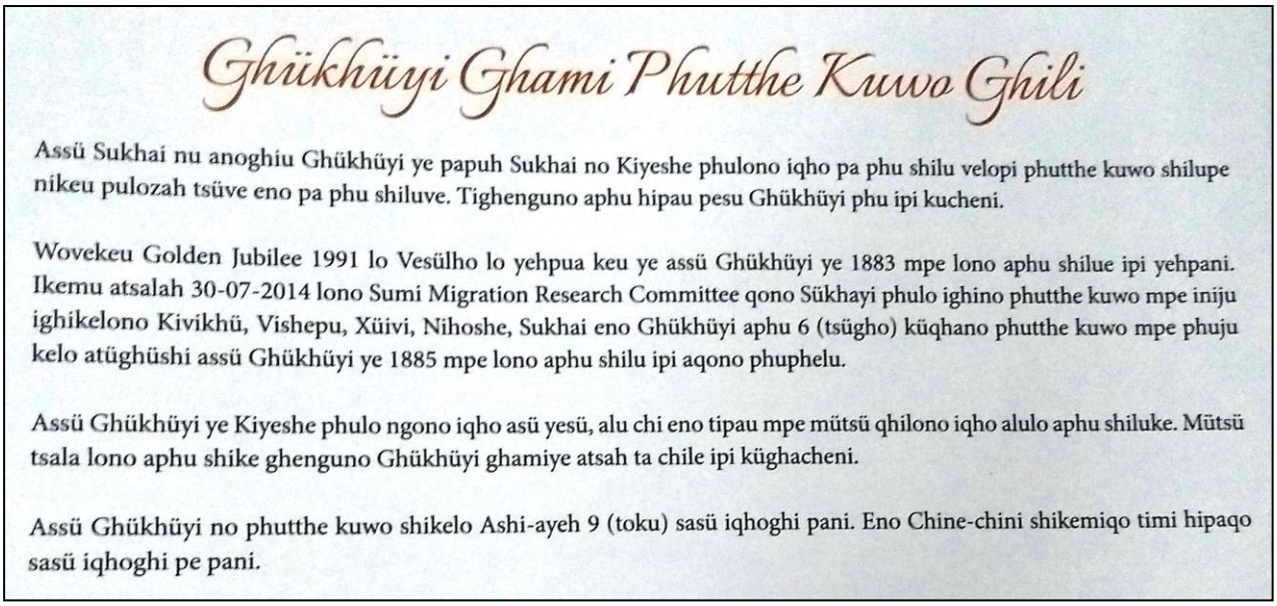
History of Ghukhuyi village

Huton (1921) in 'The Sema Nagas' identifies Semas as a migrant tribe. This was corroborated by the village council head according to whom the Sema had migrated through the Chin State of Myanmar. The Sumi Nagas are of Mongoloid race, which migrated from Far East of Mongolia passing through the South west part of China entering into the Kachin land. It is said that Kachin and Nagas are brothers. Kachins permanently settled at the place where they are now inhabited but the Nagas migrated further towards the West and departed from the Kachin brothers. Further they migrated passing through Myanmar (Burma) and lastly entered Manipur and settled at Mikhel. The Sumis, one of the Naga tribes, migrated from Mikhel and lastly permanently settled in the present Nagaland. Ghukhuyi is the descendant of those forefathers.

Ghukhuyi, the son of Sukhai founded the village in 1885, with the patronage of his father, the chief of Sukhai village in accordance with o Sumi customary law. Therefore the village was named Ghukhuyi after the founder, thethe eldest son of Sukhai. According to Huton (1921) "*it is customary for the eldest son of a Sema chief to take, when he is old enough to manage it, a colony from his father's village and found a new village at a convenient distance in which his*

authority is permanent. If the parent village is large enough, other sons will take other colonies in other directions, leaving a younger brother to succeed their father in the original village." Ghukhuyi is situated within 3kms (NW) of Sukhai village and was the first village to branch out of the parental village. The selection of the village chief is mostly hereditary in the Sema community.According to the village heads, Sukhai (head of the parent village) surveyed the area before demarcating the village boundary, based on factors such as water availability and safety. The highest expanse of land was considered appropriate for the main settlement, with jhum land surrounding it.

During British rule, Nagaland was one of the districts of Assam with Kohima as its district headquarters and Mokokchung as its subdivision. The British used to collect tax in addition to exploitation of the forests of the Nagas. To administer the village, the British appointed two chieftans (Figure 3 and Figure 4). Chieftans were the traditional heads of the village. Later the Indian Government recognized the traditional governance structure of Nagaland by enacting the Village Council Act, 1978.



Ghükhüyi Ghami Phutthe Kuwo Ghili

Assü Sukhai nu anoghiu Ghükhüyi ye papuh Sukhai no Kiyeshe phulono iqho pa phu shilu velopi phutthe kuwo shilupe nikeu pulozah tsüve eno pa phu shiluve. Tighenguno aphu hipau pesu Ghükhüyi phu ipi kucheni.

Wovekeu Golden Jubilee 1991 lo Vesülho lo yehpua keu ye assü Ghükhüyi ye 1883 mpe lono aphu shilue ipi yehpani. Ikemu atsalah 30-07-2014 lono Sumi Migration Research Committee qono Sükhayi phulo ighino phutthe kuwo mpe iniju ighikelono Kivikhü, Vishepu, Xüivi, Nihoshe, Sukhai eno Ghükhüyi aphu 6 (tsügho) küqhano phutthe kuwo mpe phuju kelo atüghüshi assü Ghükhüyi ye 1885 mpe lono aphu shilu ipi aqono phuphelu.

Assü Ghükhüyi ye Kiyeshe phulo ngono iqho asü yesü, alu chi eno tipau mpe mütsü qhilono iqho alulo aphu shiluke. Mütsü tsala lono aphu shike ghenguno Ghükhüyi ghamiye atsah ta chile ipi küghacheni.

Assü Ghükhüyi no phutthe kuwo shikelo Ashi-ayeh 9 (toku) sasü iqhoghi pani. Eno Chine-chini shikemiqo timi hipaqo sasü iqhoghi pe pani.

Figure 2: History of Ghukhuyi village explained in Sema language

The Ghukhuyi Attack

In 1887, the third year of the settlement of the present village, Kiyekhu villagers attacked the Ghukhuyi village while the villagers were working in theifields and killed 17 men. This was due to some land disputes of the Kiyekhu villagers. After hearing this tragic news, the Deputy Commissioner of Kohima visited the Kiyekhu village and took action against the Kiyekhu village by burning down their houses and imposing fines. The disputed land was given to Ghukhuyi village as a reprisal. Technically, Kiyekhu, Ghukhuyi and Hokiye are from the same pedigree. In time, the Kiyekhu people apologised to the Ghukhuyi villagers and attempted reconciliation. The Ghukhuyi villagers accepted their apology and on January 11, 2014, rituals were performed as per the Sumi Naga customary laws in the Ghukhuyi Baptist church. An epitaph was erected near the village gate in memory of the dead and to commemorate the reconciliation.

Figure 3: Map indicating the Chin region of Myanmar

Source: https://en.wikipedia.org/wiki/File:Burma_Chin_locator_map.png

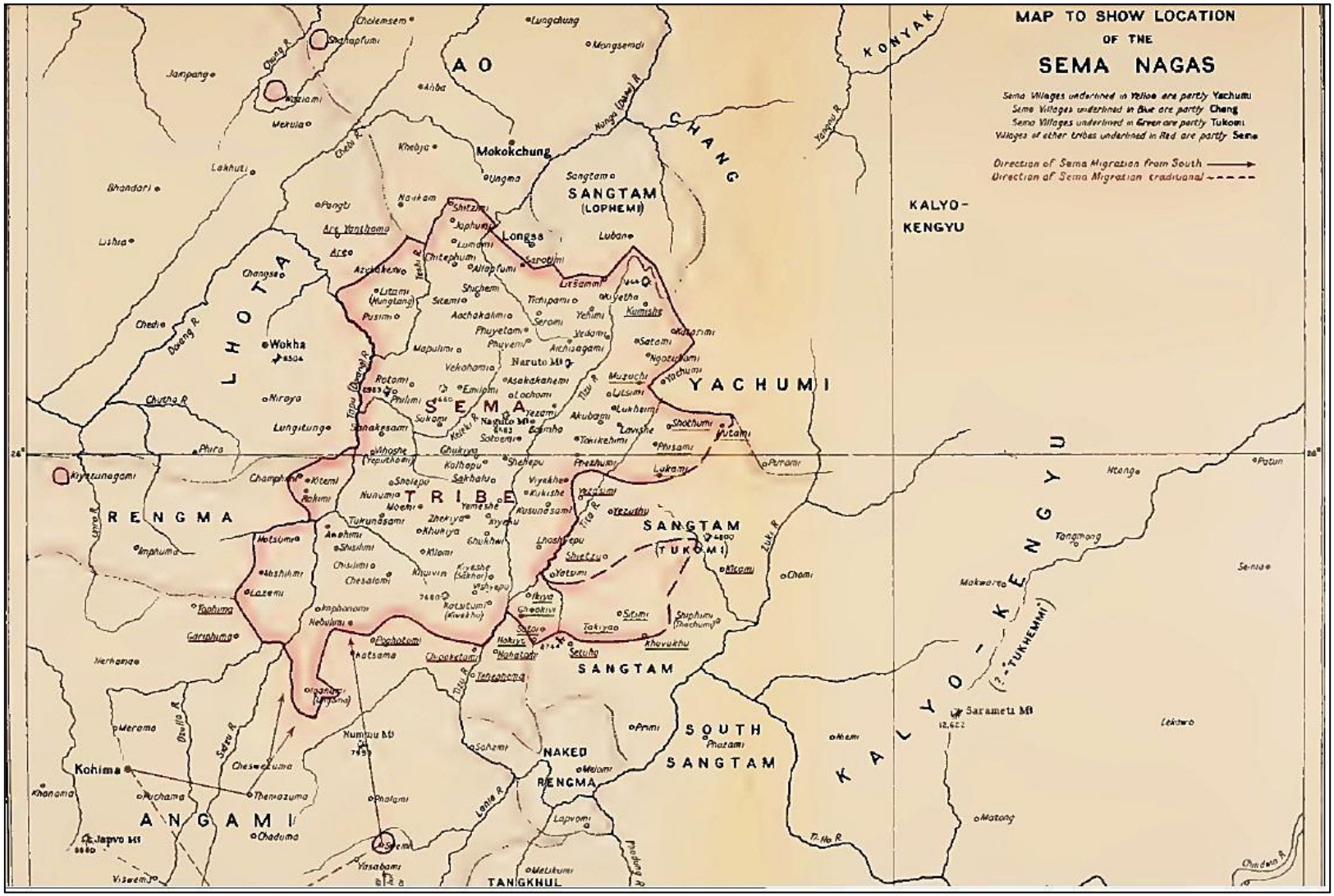


Figure 4: Map showing the location and migration of Sema nagas

Source: Hutton, 1921

Layout of Ghukhuyi village

Ghukhuyi is bestowed with a natural river and two streams. Yayi stream in the north, Kutu stream in the south form the boundary of the village. Tizu River cuts across the jhum area, separating the Viylipuuto and Chazuto area from the rest of the village. Azukhikhi passes right through the centre of the village. Jhum land encircles Ghukhuyi main village.

Earlier, Ghukhuyi had 11 jhum cycles. Recognizing the need for conservation a resolution was passed by Ghukhuyi Village Council in 2016 to protect portions of "Yeyi, Tushokineto, Viylipuuto and Chazuto" area (located in the far south of the village) earlier used for *jhum* cultivation. Several households have their terrace fields adjoining Tizü River (locally referred as Pani Kheti)[27] for cultivation of paddy.

The village has several water ponds which are used for fisheries. Most ponds are owned privately by households, except one owned and managed by the Baptist Church. The church pond is located within the main village. An exercise was undertaken to draw the various landmarks and position of village Ghukhuyi by the local people (Figure 5 and Figure 6).

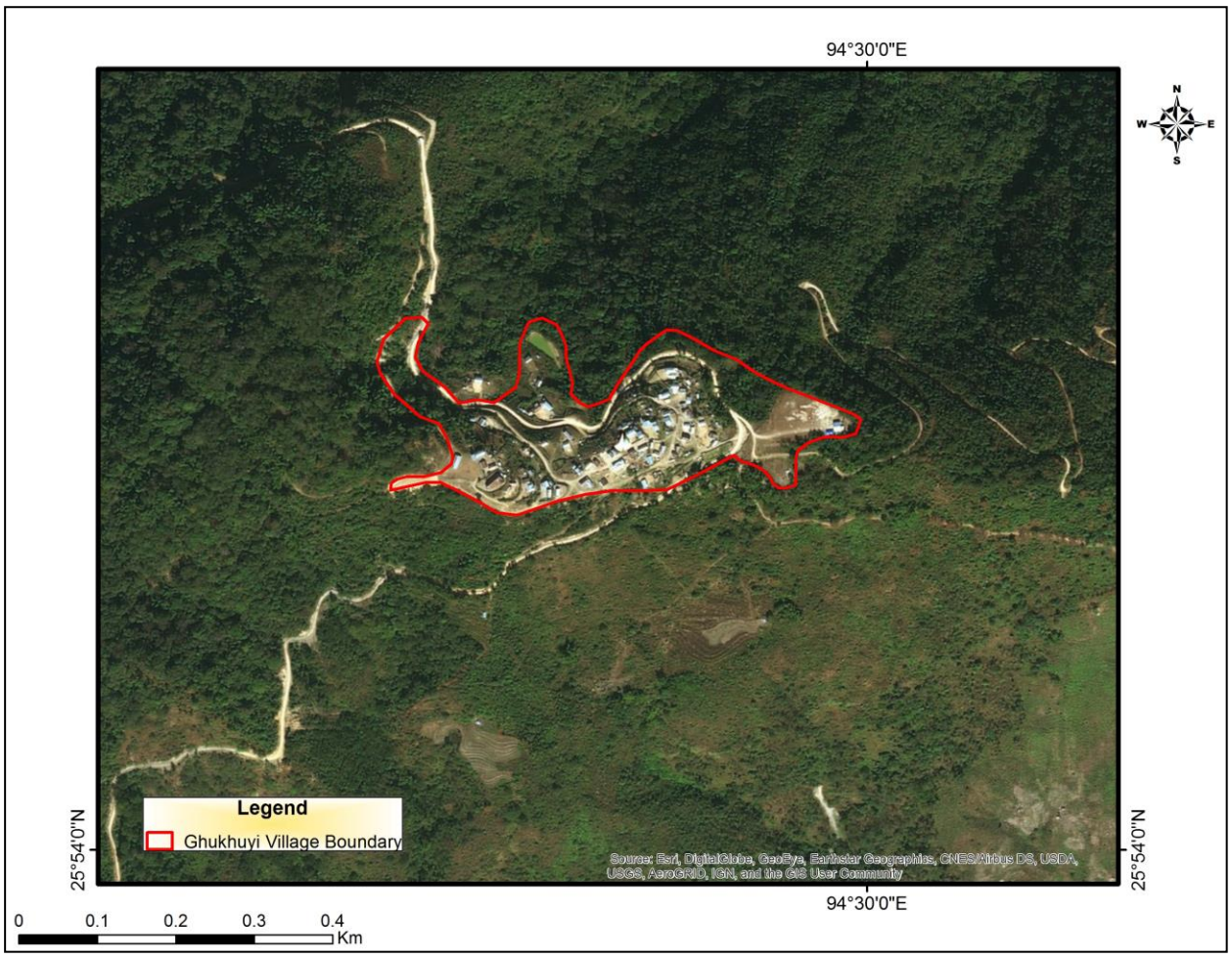


Figure 5: Google map of village Ghukhuyi showing its location and spread

[27] Water-fed cultivation

Figure 6: Resource map of village Ghukhuyi showing its location and spread

Types of Houses in Ghukhuyi

Ghukhuyi village comprises of three types of houses, composed of 1) bamboo and tin, 2) wood and tin, and 3) concrete houses with tin roofs. Houses made of bamboo and tin are the most common. Materials used in house construction are important indicators of the distribution of wealth across households. It was observed that within Ghukhuyi, households with greater wealth had houses built of concrete and/ or wood with tin roofs. A typical house in Ghukhuyi village consists of 2-3 bedrooms, a detached kitchen, detached bathroom, and a granary to store paddy, maize and other harvests. Adjoining the granary is a confined space where pigs and hens are raised. Each household maintains a kitchen garden which supplies most of their daily fruits and vegetables (Image 10, Image 11 and Image 12).

Image 10: A typical Sema house with a kitchen garden

Image 11: A unique hen shade developed at the side of the kitchen

Image 12: Different types of houses in Ghukhuyi village

The population of Ghukhuyi

As of January 2017, Ghukhuyi village had 54 households and a total population of 250, with 49% males and 51% females (Image 13). The social mapping conducted with the villagers revealed that an average household in Ghukhuyi comprises of 4 members.

Image 13: Women of Ghukhuyi village in their traditional attire

Age profile of Ghukhuyi

Ghukhuyi is a young village with most of the population, (49 percent), in early and middle adulthood i.e. the age group of 18 to 50 years, and 30 percent in childhood, and adolescence, of which 7 percent are below 5 years of age (Figure 7).

Ghukhuyi is in a phase of demographic transition, with the maximum proportion of the population between 18 years to 50 years, in comparison with elders i.e. 50 years and above. This trend further corroborates the need for a PBR for villages such as Ghukhuyi to conserve traditional knowledge and practices, for future generations, and for sustaining the natural ecosystem.

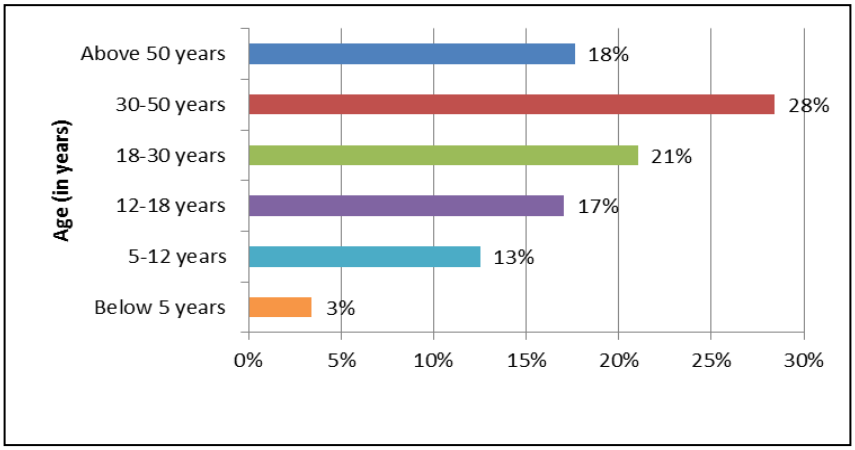


Figure 7: Age Profile of Ghukhuyi village

Renowned Leaders from Ghukhuyi village

The village has produced several prominent leaders namely

- Kuhoto Hd. DB, Member of British Empire;
- J. Kughato Sukhai, Member of British Empire;
- Alo Kilonser, Prime Minister of the Federal Govt. of Nagaland;
- Gen. Kaito Sukhai, Federal Govt. of Nagaland;
- K. Zuheto Swu, DIG III BSF;
- K. Vikuto Zhimomi, President, Nagaland G.B Federation and Chairman GBs and DBs Joint Forum, Nagaland

Beside this, many doctors, engineers, Gazetted and No- Gazetted officers hail from Ghukhuyi, and the village is listed as the leading educated village in Satakha Block, ADC Headquarters, Nagaland.

Clans in Ghukhuyi village

A 'clan' can be defined as a group of people tracing descent from a common ancestor. Consequently, personal identity in tribal societies is closely linked to clan membership. Clan has an important role to play in the polity, culture, values and custom of the Sema household. Hutton (1921) recounts, "*Several Naga traditions in various tribes suggest that the race may have had a mixed origin. The most consistent and explicit of many diverse traditions is one which speaks of the first man as one Nikhoga, who had six sons, these six founded six clans. Some tradition identifies these six original clans as the Asimi, Awomi, Chunimi, Ayemi, Achumi, and Yepothomi another tradition which relates to Nikhoga Nikhoga was only able to find a wife for the eldest, and the others kept intriguing with her and had to be ejected, so he made a feast, killed a pig, a dog, and a goat, and called on his sons to choose their shares. The founder of the Chunimi took the dog's head, and his clan are called Chunimi because, like a dog, they eat everything, Chu = "eat." The*

ancestor of the Awomi chose the pig's head and were called after it, for Awo = "pig." That of the Ayemi made a great hullabaloo when carrying wood to cook the feast, hence the name Ayemi from yeye = "jabber," The fifth son started off eating first, and his descendants are therefore called Achumi, from Ana = "rice" and Chu = "eat." The sixth stood looking on in silence and so earned for his family the name Yepothomi, the silent clansmen, from aye = "clan" and put Jio = " night" and therefore silence".

Table 1: Clans residing in Ghukhuyi

Sr. No	Clan Name	Number of Household
1.	Asumi	2
2.	Awomi	7
3.	Ayemi	14
4.	Zhimomi	16
5.	Chophimi	4
6.	Murru	3
7.	Kibami	2
8.	Tsuqumi	2
9.	Achumi	4
Total		**54**

Zhimomi and Ayemi are two dominant clans within the Ghukhuyi village (Table 1). Other clans include Aomi, Achumi, Chophumi, Yepthomi, Kibami and Tsugumi. A descendant from Sukhai, Gukhiye is a Zhimomi village. Hutton (1921) records the origin of Zhimomi clan, is believed to be derived "*either from azhi, "blood," and mo," not," because they were of no one's blood, or, with less probability, from zhu, " perceive," and mo, " not," because no one could point to the husband of the mother of their first male ancestor. The clan traces its human descent to an ancestress, one Putheli, a daughter, by some accounts, of Khoghamo, father of Chesha and Cliishi, and who was the father of her son perhaps mattered Uttle enough before the fashion in genealogies became patrilineal "*.

Image 14: Various Clans during local Naga festivals

Out-migration

Nagaland has high rural to urban migration. According to Aier and Kithan (2011) migration in Nagaland may be understood as forced circumstances rather than dictated by desire for a change in lifestyle. The reasons for rural-urban migration in Nagaland are about the same as for any other State of India i.e., lack of job opportunities in rural areas, better educational possibilities and better health facilities[28].

Resonating with the above trends, social mapping exercises indicated that large number of households have migrated for better jobs opportunities and education. Children soon after their basic schooling within village are sent to cities such as Dimapur, Kohima, Sataka, Zunheboto, Delhi and Assam. Ghukhuyi village also lacks basic health facilities, due to which most families have to depend upon health centers in neighboring cities[29].

The Ghukhuyi economy

People of Ghukhuyi are highly educated and are known to bring many accolades to the village. After higher education, most households choose to establish their homes in neighbouring towns and cities though they continue to contribute to the income of the village through remittances. However, the local economy is largely agriculture and forest centered. Both jhum and terrace cultivation has been practiced in the village since time immemorial. Paddy, maize, pulses and millets are the main staple food grains produced along with other crops like chilli, potato, pumpkin, cucumber, beans, oilseeds and vegetables. The supplementary crops are produced mostly for self consumption. The village

[28] Anungla Aier, and Thungchanbeni Kithan, *Rural-Urban Migration, A Thematic Report*, Department of Planning and Coordination, Government of Nagaland, 2011

[29] Refer to section on basic facilities in Ghukhuyi

practices a nine year Jhum cycle. Many households in the village are seasoned artisans and make wooden plates[30], cane baskets, furniture and even wooden houses. These products are however made during the lean season when the local people have time to spare from agriculture. The size of wooden plates varies and the standard plate of 16 inches costs upto five thousand which depends on the type of wood used (Image 15). Similarly, the cost of a standard sized cane basket is INR 700-900.

Image 15: Villagers of Ghukhuyi making wooden artifacts

The villagers of Ghukhuyi rely on wood derived from the clearing of jhum land for cooking, house repair or maintenance and it also forms a large part of their income. Certain fruits, vegetables and grains harvested from jhum forest also form a part of their daily diet. Further, each family is involved in animal husbandry which is a source of additional income. Commonly raised animals include pigs, hens and dogs. There is growing interest amongst the people of Ghukhuyi in jobs in the organized sector-some village members are engaged in government services, and have migrated to nearby towns such as Sataka, Zünheboto, Kohima and Dimapur.

Agriculture in Ghukhuyi

Farmers of Ghukhuyi village continue to follow, slash and burn agriculture or *jhum* cultivation[31] (Image 16). After clearing, each *jhum* area is cultivated for three years. Farming in Ghukhuyi is mostly subsistence in nature. Ghukhuyi, recognizing the importance of biodiversity conservation, has designated 3.70 sq. km of land as a community-conserved area. The village has always been sensitive towards natural resources, recognizing the importance of a forest for its multifarious benefits; and has been conserving the western patch of forest as it is also the source of several water springs for both Sukhai and Ghukhuyi village.

[30] Used by Semas to eat their meals

[31] Jhumming cultivation is an agricultural practice in which agricultural/ Jhum land is divided into Jhuming area cultivated on a rotational basis. The practice involves clearing the area by felling trees and setting fire. Numbers of year in which a Jhum area is cultivated is called Jhuming cycle.

Image 16: Jhuming of land for agriculture

Paddy, the staple crop, is grown both in jhum land and on the river bed. *Miyeghu* the local variety of paddy is sown in the jhum fields, whereas the hybrid variety of paddy, procured from government agricultural centers is sown on the river bed. Pesticides are only used for hybrid variety of seeds. Table 2 provides sowing and harvest cycle of paddy.

Table 2: Crops grown in Ghukhuyi village

Sowing		Harvest	
April-May	Paddy (on Jhum Land)	September	Maize
June-July	Paddy (on the *Tizü* river bed)	October	Paddy

Animal Husbandry

Warriors as they are by nature, the Semas love hunting, and relish the meat of wild animals. Rice is their staple food, which is eaten with meat. The meat is mostly pork, beef and chicken, but it can also be snails, rats, squirrels, dogs, cats, mithuns, buffaloes, deer, birds, crabs, monkeys, shrimps, insects, worms, and almost everything that is wild. Slaughtering of pigs, cows and mithun is an important feature of important Sema festivals such as Ahuna and Tuluni. Pork is the most preferred meat and there are different styles of preparing it. It can either be freshly cut, boiled and eaten or it can be smoked, dried and used for later consumption. Many wild animals are also considered to have medicinal value such as the Hoary Bamboo Rat (*Rhizomys pruinosus*) which is used to treat headaches. The locals chip the front incisors of the rat and withdraw a drop of blood which is then put on the head of the patient to relieve fever and headaches. It is also used during delivery to help in blood clotting. Soup of the rat is offered to patients suffering from weakness and tuberculosis.

Due to rampant hunting, several wild animals are disappearing from parts of Nagaland, including the Great Hornbill which was once found in the forests of Ghukhuyi, according to the village elders. Animal rearing for subsistence has become important for the people of

Ghukhuyi. Consumption of meat, however, has reduced and while variable from household to household, on an average, a household may have a meat dish on their menu only twice to thrice in a week. It was reported that many households have now started buying pork meat from the butcher shops located in Zunheboto town. These shops, around 10 of them, source their meat from the neighbouring state of Assam.

Image 17: Mithuns present in Ghukhuyi village

Image 18: Pigs, Cows and Hens reared in the village

Animal husbandry not only contributes to the food basket and nutritional security of the Sema, it is also a source of household income. Table 3 provides details of animals commonly reared by the people of Ghukhuyi.

Table 3: Details of commonly sold items in Ghukhuyi village

Sr. No	Animal	Use	Method of Keeping	Remarks
1.	Pig (Awo)	Household consumption and commercial rearing. Meat is sold @INR 180/ Kg	Reared in confinement in the backyard of each house.	Reared for meat during festivals and for financial emergency
2.	Dogs (Atsu)	Household consumption and commercial rearing. Meat is sold @INR 200/ Kg	Raised as pets	
3.	Hen (Awu)	Household consumption and commercial rearing. Meat is sold @INR 500-600/ 2-3Kg	Reared in confinement in the backyard of each house.	Hens in the village got infected and died
4.	Mithun (Avi)	Commercial rearing. Meat is sold according the size. Big Mithun – INR 1 lakh. Small Mithun – INR 20000 to 30000	Reared in open forest	Considered important for festivals such as Tulhuni and Ahuna
5.	Cow (Amishi)	Household consumption and commercial rearing. Meat is sold @INR 150/ Kg. Also sold according to size Big cow @Rs.15000 to INR 20000 Small Cow @INR 15000	Reared in open forest	
6.	Cat (Akhosa)	Domesticated	Raised as pets	

*** Goats were also raised earlier; the practice of raising goats however has stopped**

Importance of the Kitchen Garden

A kitchen garden is an important feature of Ghukhuyi, contributing to nutritional security. Each house depending upon the availability of land maintains a kitchen garden, which comprises of vegetable, fruit plants and trees. A list of fruits and vegetables commonly found in a kitchen garden of Ghukhuyi village is provided in Table 4 and Table 5.

Table 4: Sowing and harvesting seasons for some key vegetables grown in Ghukhuyi village

Sr. No	Vegetable/Fruit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.	Chilli												
2.	Brinjal												
3.	Ginger												
4.	Pea												
5.	Pumpkin												
6.	Salad Onion (white and pint)												
7.	Beans												
8.	Okra												
9.	Onion												
10.	Potato												
11.	Tomato	Year Round (sown and harvested)											
12.	Squash												
13.	Yam												
14.	Sweet Potato												
15.	Drum Stick												
					Key		*Sown*				*Harvested*		

Table 5: Fruits and vegetables cultivated in Ghukhuyi village

Sr. No.	Local Name	Scientific Name	Use
1.	Aghushibo	*Thelypteris palustris*	Fruit and leaves consumed as vegetables
2.	Ahenguye (MuskMelon)	*Cucumis spp.*	Used as vegetable. Seeds used for making *chutney*
3.	Aikhu	*Glycine max*	A local variety of pulse. It is prepared in leaves

Sr. No.	Local Name	Scientific Name	Use
	(Soyabean)		(e.g. banana leaf) and is known to be high in vitamins. Beans and grinded and milk produced is consumed.
4.	Akakhu (Wild EggPlant)	*Solanum torvum*	Seed used in alcohol preparation. Seeds are also of medicinal value. They are used in special soup preparation to heal cough. Boiled and eaten as whole.
5.	Akhakhu	*Solanum indicum*	Fruit of the plant used as vegetable
6.	Akhakhu Akijeu	*Solanum gilo*	Big Fruit of the plant used as vegetable
7.	Akhakhu Aklotiu	*Solanum torunm*	Fruit of the plant used as vegetable
8.	Akini (Wild Sesame)	*Perilla ocymoides*	Oil extracted from the seeds used in cooking. Oil is also used as ointment on cracks and smoothing of skin.
9.	Akini (Wild Sesame)	*Perilla frutescens*	Oil extracted from the seeds used in cooking.
10.	Aku-u (Wild Ginger)	*Zingiber cassumunar*	Used as a spice, as an antibiotic, stomach pain reliever. High medicinal properties. Very important for cooking.
11.	Aniza (Naga Pudhina)	*Mentha longifolia*	Key ingredient for chutney (sauce), garnish for several vegetable preparations. It also holds medicinal value, mostly used during dysentery and vomiting
12.	Ashebaghe/ aghuye	*Centella asiatica L*	Leaf consumed as vegetable, used in control of high BP
13.	Asudeghuna (Sweet tomato)	*Cyphomandra betacca*	Used as vegetable and for prearing *chutney*.
14.	Asukhakhuye	*Solanum indicum*	Consumed as leafy vegetable. Also holds medicinal value. Used for controlling blood pressure.
15.	Asuyikhu	*Cajanus cajan*	Seed used as vegetable
16.	Atsuno	*Allium chinensis*	Similar to onion. It is used in pickle and *chutney*. Atsuno is of various types as described below
17.	Lavatsuno		Roots and leaves used as vegetable

Sr. No.	Local Name	Scientific Name	Use
18.	Chowotsuno		Commonly called *Lahesun*. Used in making *chutney*. Seeds are medicinal.
19.	Apotsuno		Roots and leaves used as vegetable
20.	Avotsuno		Roots and leaves used as vegetable
21.	Atsunilimiye		Consumed as vegetable
22.	Atsunoqhu (Sorghum)	*Sorghum bicolor*	Consumed as millet. Used in making local bread. Used in preparing local alcohol.
23.	Atuye	-	Leaves are used.
24.	Axupi-bo	*Nicotina tabacum*	Used as mouth freshener (sadapaan). Also used to keep away leeches and reduce itching incase of insect bites.
25.	A-Yi	*Colocasia esculenta*	Corm used for food
26.	Beghuna (Wild Tomato)	*Lycopersicon lycopersicum*	Fruit used as a vegetable and in chutney
27.	Fern(Khakhuye)	-	leaves used as vegetables
28.	Ghatsuye	*Wedelia chinensis*	Leaf vegetable boiled good for gastric
29.	Ghatsuye	*Sonchus wightianus*	Leaf consumed as vegetable
30.	Ghughuye (Shrub)		Consumed as a vegetable. Mostly eaten with rice
31.	Karela (Bitter Gourd)	*Momordica charantia*	Used as vegetable. Not a native to Nagaland.
32.	Khatrashi (Eggplant)	*Solanum melongena*	Fruit used as vegetable
33.	Khatsokiniye		Used as vegetable.
34.	Khobaya	*Solanum nigrum*	Used as leafy vegetable. Juice used as a cure for coughs.
35.	Khobaye (Wild Gooseberry)	*Physalis minima*	Leaves used as vegetables
36.	Khobaye achiu	*Physalis peruviana*	Leaves used as vegetables

Sr. No.	Local Name	Scientific Name	Use
	(Cape Gooseberry)		
37.	Khughughu		Medicine for teeth. Burn the fruit and siphon smoke through a bamboo pipe to teeth and leeches are removed from nose of cows
38.	Khulape		Used as fodder for cattle
39.	Khuuthi (Climbing Bean)		Seed pods are used in raw chutney. When Ripped seeds are used as legume.
40.	Kolahiye		Consumed as vegetable
41.	Konathe		A type of bean. Used as pulse or in chutney preparation.
42.	Kopi		Similar to cabbage. Eaten as fried vegetable.
43.	Kughuzupaye		Consumed as vegetable
44.	Kumthopuniye	*Impatiens spp.*	Leaves used as vegetables
45.	Kumutho-puni-ye	*Impatiens spp.*	(eaten) wild leaf, grown by the water drain
46.	Lavatsuna	*Allium hookeri*	Leaves used as vegetables
47.	Lozuye	*Clerondendrum fragrans*	Leaves used for colouring baskets green. Also consumed as vegetable.
48.	Mighichiniye	*Costus spp.*	Leaves used as vegetables
49.	Mighishi	*Capsicum annum*	Fruit used as spice and in chutney
50.	Mishinikhaye	*Polygonum chinense*	leaves used as vegetables
51.	Moobusu	*Ficus auriculata*	Young tender leaves used as vegetables
52.	Naga Dhania	*Eryngium foetidum*	Junglee Naga dhaniya growing on hill side
53.	Naghu-kuphu	*Celosia spp*	Vegetable Cocks comb
54.	Nananiye (Glory Bower)	*Clerondendrum colebrookianum*	Wild climber – used for reducing BP – It is boiled with rice
55.	Nikeniye (Buddha Coconut)	*Sterculia alata*	Leaves used as vegetables

Sr. No.	Local Name	Scientific Name	Use
56.	Otsu (Black sesame)	*Sesamum indicum*	Extract oil, used in chutney, sweet tilladoo
57.	Shepshe	*Ipomoea batata*	Root consume as food. Leaves consumed as vegetables.
58.	Shoqheye (Indian Gaub Tree)	*Diospyros peregrina*	Leaves used as vegetables
59.	Shoqheye (Fern)	*Diplazium esculentum*	Leaf used as boiled vegetable.
60.	Washiniye (Painted Leaf Begonia)	*Begonia palmata*	Leaves used as vegetables
61.	Washiniye Achiu (Brazilian Begonia)	*Begonia hirtella*	Leaves used as vegetables
62.	Yeqhiye (Deccan Hemp)	*Hibiscus cannabinus*	Leaves used as vegetables
63.	Yetsoye		Consumed as vegetable
64.	Yetsuye (Fishwort Plant)	*Houttuynia cordata*	Leaves used as vegetables. Used during gastric problems.

Status of Basic Services

During resource mapping, the status of services including electricity, water and sanitation, health and education services were also discussed with the people. A description of these services is provided below.

Electricity

All houses within Ghukhuyi are electrified. The village receives 24 hours of electricity supply each day.

Water

The village is dependent on water from the three rivers flowing in and around the village, viz. Tizü River, Yayi stream and Kutu stream. The village members recognize the importance of forests for continued water supply. They have not only protected the main water sources by conserving forests, but have laid a sophisticated water distribution system, for instance from Akhiji (refer resource map) below their conserved forest. The water from these rivers and streams is collected in a tank which is further distributed to each household

with water pipes laid over the ground. The village also has several ponds, which belong to households. Though these ponds provide an opportunity of fisheries to meet household requirement of fish and release the pressure from the rivers, the private ownership of the ponds restricts its use to a limited number of households.

Image 19: Water storage structures present in Ghukhuyi village

Health

There is only one dispensary (which is also to be relocated to the new playground) present in the village. The Auxiliary nurse midwife (ANM) visits once a month, which according to the community is not sufficient. In case of illness, people travel to Sataka as it is the nearest town.

Education

Education is considered to be equally important for male and female children. Ghukhuyi only has a primary school. Thus, most children are sent to nearby towns such as Sataka, Kohima or cities such as Delhi and Guwahati for higher education. Currently the village school is dysfunctional as it has to be relocated. Ghukhuyi has an Anganwadi Centre, one of which would be located in the same premises as the primary school, currently being managed by the Anganwadi worker from her house.

Festivals of the Sema tribe

Before the advent of Christianity in Sema land, the native tribe had a rich culture, celebrating the relationship between humans and nature. There were five different ritual performers (Chine-chinimigo), namely – Chovi-Sru-u, Hosum-Awou, Shevichi-Shiphu-u, Kuthai-Amthau, and Chomu-Laphu-u. The ritual performers officiate at different seasons. For instance, the Laphu-u performed a ceremony at the time of cutting of trees at the start of the jhum cycle. At these festivals, the spirits were propitiated with sacrifices by the village elder, the Chine-chinimigo was offered first before the village collectively enjoyed the feast.

After Christianity, the traditional sema festivals have been replaced by more common Christian festivals – Good Friday, Easter Sunday and Christmas. However, Semas continue to celebrate two of their traditionalfestivals namely Tuluni and Ahuna.

Tuluni

Tuluni held on July 8 is a festival of great significance for the Sema. This festival is marked with feasts as the occasion occurs in the bountiful season of the year. Drinking rice beer

forms an indispensable part of the feast. Rice beer is served in a goblet made of bamboo or made from the leaf of plantain. This drink is called *Tuluni* which gives the festival its name. *Tuluni* is also called "*Anni*" which denotes the season of plentiful crops. This midyear festival is a time of communal harmony and merry-making for the Sema community. Slaughtering of pigs, cows and mithun is an important feature of this festival.

Ahuna

Ahuna, held on November 14, is a traditional post-harvest festival of the Sema. *Ahuna* is a Sema traditional agricultural-calendar-end *Tiqhetini* (festival) signifying completion of successful agricultural work. It marks the time when all food items, grains, tubers and a variety of vegetables from the year-long farming, are collected and stored in the Aleh (Granary). Cooking newly harvested rice wrapped in Tsüzükughü (*Phryniummarantaceae* leaves) or Saphaye (*Aspidistra elatior*) leaves in fresh-cut bamboo stems is one of the main rituals symbolizing the success of crop cultivation. *Ahuna* is also a time for charting a new beginning – mapping a blue print of a new area for the next agricultural year called the Asüyekithe. For Sema ancestors, it was a time for serious divination invoking the Alhou (creator) and spirits of nature to divine if the next agricultural year would produce a good harvest to sustain the village population. According to these forecasts, measures in the form of precautionary rituals were performed to appease the spirits to ensure that the next agricultural year would be bountiful. The forecasting ritual is performed after *Ahuna* rice is consumed.

Image 20: Celebrations during Ahuna Festival

Image 21: Baptist Church in Ghukhuyi village

Decision making within Ghukhuyi

Each Naga village is like an independent 'sovereign republic' where each village owns and governs its resources, plans development activities, maintains law and order, delivers justice and secures defence. A recognized village in Nagaland has a Village Council (VC) with members elected by villagers in accordance with the prevailing customary practices and as approved by the State Government. Hereditary village chiefs, the Gaon Burrhas (GB), are ex-officio members with voting rights of the Village Councils.

Village Council and Village Development Board

According to the Nagaland Village and Area Council Act, 1978, every recognized village in the State is required to have a Village Council. Village Councils (VC) are an important component of the modern governance system in Nagaland. While the District Planning and Development Boards provides the needed flexibility to ensure a responsive and holistic approach towards development in the district, linkages to the grassroots through the Village Development Boards (VDB) have been established for delivering rural developmental inputs. The key function of the VC, are:

1. To formulate village development schemes to supervise proper maintenance of water supply, roads, forest, education and other welfare activities.

2. To help various government agencies in carrying out development works in the village.
3. To undertake development work on its own initiative or on request by the Government.

Table 6: List of members of Ghukhuyi Village Council

Sr. No	Names	Designation
	VILLAGE COUNCIL	
1.	Hoishe Zimomi	Chairman
2.	Vihoshe Aye	Secretary
3.	Kihozhe Zhimo	Head GB
4.	Vikuto Zimo	GB
5.	Vihoi Ayeh	GB
6.	Shikato Zhimo	VDB Secretary
7.	Zhehoi Awomi	Council Member
8.	Kitovi Awomi	Council Member
9.	Tokugha Zhimo	Council Member
10.	Abeto Ayeh	Council Member

Image 22: Mr. Kihozhe Zhimo (Head GB) along with his wife

Image 23: Village Council members of Ghukhuyi village

Other village committees within Ghukhuyi village include PHED, Health Centre and Education.

Table 7: Names of Chairman of Village Commitees and Members

Sr. No	Name of Chairman	Village Committee
1.	Shikato Zhimo (GB)	VDB Sectretary
2.	Vihoshe Aye	Education Committee Chairman
3.	Kihozhe Zhimo (Head GB)	PHED Chairman
4.	Ihoshe	Medical Chairman
5.	Vihoi Ayeh (GB)	Electricity Chairman
6.	Vikuto Zhimo (GB)	Anganwadi Chairman
7.	Kihozhu Zhimo (Head GB)	Disaster Chairman

Conclusion

People based on their relation to Ghukhuyi natural resources can be broadly divided into two groups – those people who are intimately linked with nature and the changing seasons and the second group of people who are outside the immediate orbit of the village's natural resources. The first group, are the people directly reliant upon ecosystem services, and their nature of interaction with the ecosystem varies in accordance with changes in biodiversity. This group includes the farmers, hunters, and households dependent on timber and non-timber produce from the forest. The second group consists of the people who have an indirect relationship with Ghukhuyi's ecosystems and have little influence, on and are little influenced by, the changes in its ecosystem.

Ghukhuyi, further, revealed that the village is in a phase of demographic transition with the maximum proportion of population between 18 years to 50 years in comparison to elders i.e. 50 years and above. Furthermore, a change in the aspiration of youth to pursue tertiary sector jobs poses a severe threat to the community's traditional knowledge base. There is an urgent need to conserve not just the biodiversity of Ghukhuyi, but also the community's knowledge of customs and traditional practices that are inextricably tied to the area's biodiversity. PBRs can prove a useful tool in this regard.

Conservation is only possible by shifting dependence of people to alternative sources, or by means of sustainable harvests. The potential of common resources can be tapped to reduce or shift dependence of communities on their natural ecosystems. For instance in Ghukhuyi the natural springs provide an opportunity for developing local fisheries, thereby reducing pressure on fish fauna in the Tizu River, and supporting the natural regeneration of aquatic biodiversity.

Chapter V: Lifescape

Introduction

Along with the "P" for people in the PBR, "B" for biodiversity is also very important. The state of Nagaland is endowed with natural beauty and falls in the Indo-Burma biodiversity hotspot, one of the 35 hotspots identified globally. This hotspot is confined to 1.4% of the earth's land surface, but harbours about 35% of known vertebrate species with high levels of endemism. The remarkable floral and faunal diversity of the area can be attributed to the wide range in climatic conditions, elevation gradients and vegetation types that are characteristic of the state. So far, floral studies reveal over 2400 species of angiosperms, 22 species of bamboo and 340 species of orchids. Around 490 species of butterflies, 487 species of birds and 106 species of mammals have been documented from Nagaland (*Source: nagenvis.nic.in*). The state has the tallest rhododendron in the world, the tallest rice plant, as well as the tallest and the rarest orchids such as the Tiger orchid *Grammatophyllum speciosum*, *Cymbidium tigrinum* and *Bulbophyllum rothschildianum* (*Nagaland FD, 2014*). The state has been termed as 'Falcon Capital of the World' as millions of Amur Falcons (*Falco amurensis*) congregate near the Doyang reservoir in Wokha district every year, during their annual migration from Mongolia to South Africa.

Biogeographically, the area of Ghukhuyi falls under the 8B/ C2 Khasi sub-tropical wet hill forest primarily overlapping with the 9/ C2 Assam sub-tropical pine forest that holds flora typical of this a region. The Tizü River borders the Ghukhuyi village and is an important source of water for agriculture. Protecting this ecosystem is not only important for the local biodiversity, and for the people of Ghukhuyi who can continue to draw upon its myriad ecosystem services, but also because these forests have connectivity to other hill ranges such as Satoi that are relatively undisturbed with high biodiversity including the Blyth's Tragopan. This ensures that conservation at the landscape level occurs, and allows for possible movement of species across the landscape, preventing fragmentation of wide-ranging populations of species. Since the neighbouring village of Sükhai has already put a complete ban on hunting and illicit felling, it is imperative for the village of Ghukhuyi to initiate and exercise strict laws and ban in order to protect its natural resources for generations to come.

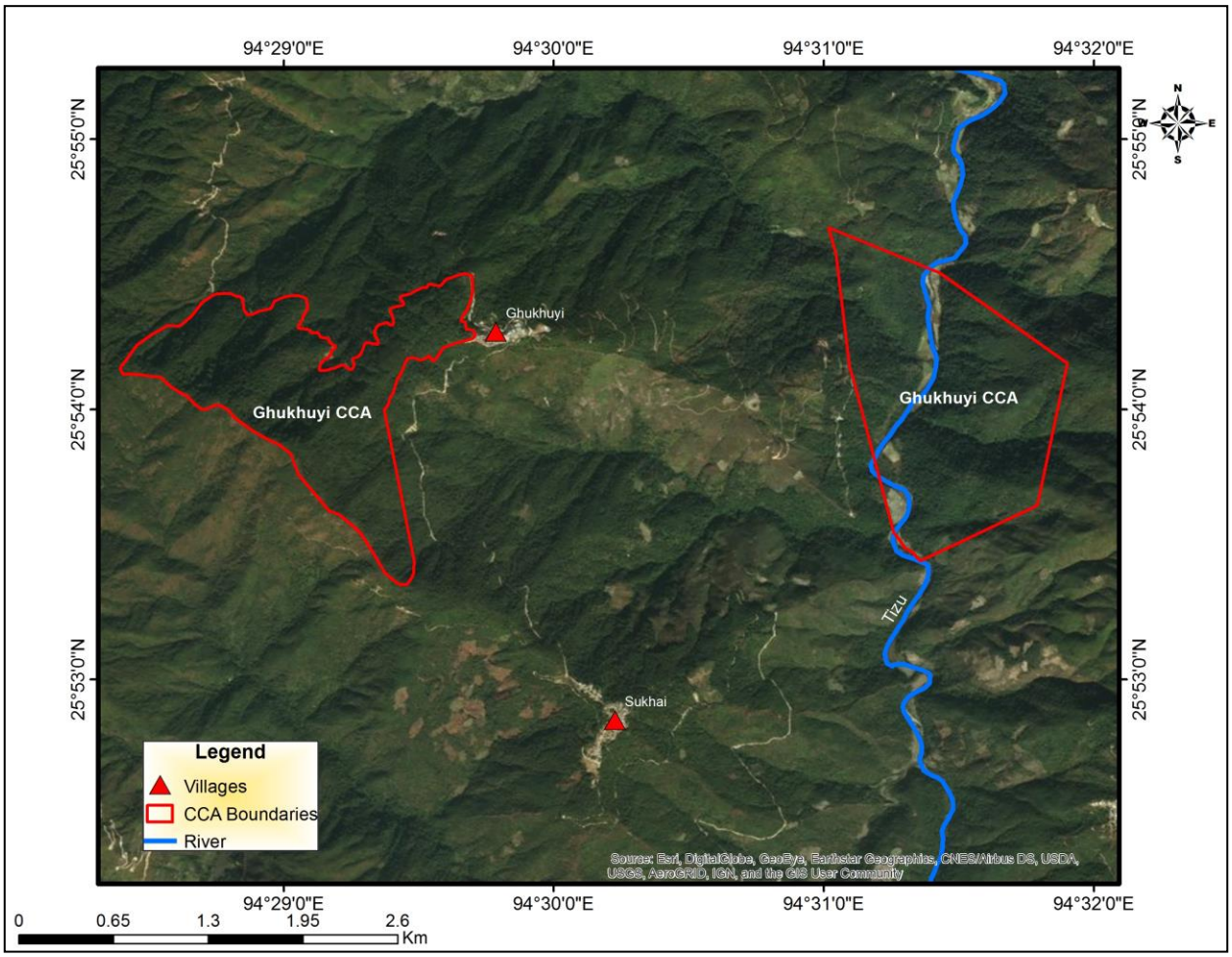


Figure 8: Community Conserved Areas of Ghukhuyi Village

A resolution was passed by Ghukhuyi Village Council in 2017 to conserve the "Tuzuqha, Kutu and Yayi including Azhoqha above Zhekiye Satoi road" area of their forests (total area= 3.70 sq. km) earlier covered under jhum cultivation, so as to safeguard the natural ecosystem including living and non-living resources and maintain it for present and future generations.

The total number of wild plant and animal species present in the Ghukhuyi Community Conserved Area could run into the thousands. A majority of these belong to small invertebrates, and a significant fraction of these remain to be identified. Some could potentially even be new to India or even science. It is therefore not possible to list the entire range of biodiversity found in Ghukhuyi at the present moment. The current focus therefore, is to ensure that the PBR creation process generates some useful and reliable information and documents especially the village elders' traditional knowledge for posterity. It is therefore, entirely appropriate that this focus be largely on the species of interest to the local community. Moreover, the local community is responsible for maintaining this register. They can keep updating it as new information becomes available, and we will give them with soft copies of this report to facilitate this process. At Ghukhuyi village, the scope for a lifescape[32] study is significant as people's dependence on their natural resources is high.

[32] Narrative that details the synergy between the environment and an individual's socio-economic circumstance, cultural norms, and behaviour over their lifespan.

The people's list of biodiversity

This section includes the people's list of plants, mammals, birds, butterflies and other fauna found in their forests, with their local and scientific names. It was noticed that the locals could identify 204 bird species in and around Ghukhuyi village. Similarly out of 32 mammals found, 24 were identified by the locals. Around 99 species of plants were identified by the locals in the Ghukhuyi CCA. The people had their own unique names for the species, and often an interesting titbit of accompanying folklore. Table 8 gives an overview of the number of species found in Ghukhuyi belonging to different taxa.

Table 8: An overview of the numbers of plant and wild animal species found in Ghukhuyi

Sr. No.	Name of group	Number of species	Sr. No	Name of group	Number of species
1.	Trees - including plants for NTFP, timber, fibre, and medicine.	127	7.	Butterflies (A*mimi*) and Moths	140 + 13
2.	Shrubs and Herbs	98	8.	Fish (*Akha*)	57
3.	Plants cultivated in kitchen gardens	30	9.	Amphibians *(Achüi)*	9
4.	Ferns	11	10.	Reptiles	30
5.	Insects (*Pitheninga*)	37	11.	Birds *(Aghaü)*	223
6.	Livestock	7	12.	Mammals *(Tüghashi)*	34

It appears that the range of species known to people is correlated with their dependence on the area's natural resources. At Ghukhuyi village, it was observed that the local people knew most of the species from all major taxonomic classes. This is because the *Sema Nagas* are a hunting community and know their forests well. It was found that every major taxonomic class has a local name, use and sometimes folklore associated with it. For example, birds were refered to as *Aghaü*, mammals as *Tüghashi*, insects as *Pitheninga*, bats as *Ashüxa*, and butterflies as A*mimi*. In a reflection of changing times and dependency on natural resources, while the *Gaon Burrahs* and the elders were quick and accurate in identifying various *taxa,* the younger generation had limited knowledge of the biodiversity around them. It was also observed that the hunting community in the village were good at mimicking different bird calls, knew the varied habitats and paths used by mammals, and were quick to find medicinal plants in the forest.

The species documented during PBR information collection process is a smaller subset of the total species and we expect that more species will be added in the list with time.

Flora

Ghukhuyi village lying in the heart of Nagaland has 8B/ C2 Khasi sub-tropical wet hill forest primarily overlapping with the 9/ C2 Assam sub-tropical pine forest. The floral diversity for

Ghukhuyi is a total of 99 tree species and 99 herb/ shrub species that have been identified with the help of locals. A detailed list of the trees, shrubs and herbs has been provided in annexure 5.

Image 24: Sub tropical forests present in Ghukhuyi village

Fauna

The inventory of faunal species for the village Ghukhuyi includes 35 mammal species, 204 bird species, 140 butterfly species, 25 reptile species and 10 frog species that were identified and described by the village people. This is probably still a fraction of the total number of species found here, and it is expected that more records will be added to this list. Amongst the mammals, the major ungulate species include the Sambar (*Cervus unicolor*), Indian Muntjac or Barking Deer (*Muntiacus muntjak*) and the Red Serow (*Capricornis rubidus*). Tigers and leopards which occurred 3-4 decades ago are now locally extinct. However, lesser cats like the Jungle cat (F*elis chaus*), Leopard Cat (*Prionailurus bengalensis*) and the Fishing Cat (*Prionailurus viverrinus*) thrive in the forests. Small packs of Wild Dog or *Dhole* (*Cuon alpinus*) are also present. Amongst the large carnivores, only the Asiatic Black Bear (*Ursus thibetanus*) and the Malayan Sun Bear (*Helarctos malayanus*) were earlier reported from Ghukhuyi village. The Critically Endangered (IUCN, 2015) Chinese Pangolin (*Manis pentadactyla*) is also reported to be found in the Ghukhuyi CCA.

A few ornithological surveys have been carried out in Nagaland. These studies suggest that at least 487 avian species occur in Nagaland (Choudhury-1997, 2001, 2003b, 2005). As many as 143 bird species were identified by the villagers of Ghukhuyi from the pictorial field guides. Villagers are knowledgeable about bird calls, their food plants, behaviour and times of the day during which they are most active. Many of the birds from the checklist prepared by the community were also seen by our team during our field surveys. These included patridges like the Rufous-throated Partridge (*Arborophila rufogularis)*, the Hill Patridge (*Arborophila torqueola*) and the Mountain Bamboo Patridge (*Ambusicola fytchii*), the Kalij

Pheasant (*Lophura leucomelanos*) and frugivorous birds like the Great Barbet (*Megalaima virens),* Blue-throated Barbet (*Megalaima asiatica*) and Pompadour Green Pigeon (*Treron pompadora*).

Reptiles and amphibians are poorly studied from Nagaland and the recent herpetological surveys carried out by Ramki *et.al* in 2011 recorded a total of 71 taxa; 1 turtle, 29 snakes, 9 lizards, 31 frogs and 1 species of caecilian while Bhupathy & Kumar in 2013 recorded a total of 52 taxa; 5 turtles, 16 lizards and 31 snakes belonging to 14 families. Based on the pictorial guide, villagers identified 23 species of snakes the most common species including the Indo-chinese Rat Snake (*Ptyas korros*), Red necked Keelback (*Rhabdophis subminiatus*), Short-nosed Vine Snake (*Ahaetulla prasina*) and Monocoled Cobra (*Naja kaouthia*). King Cobra (*Ophiophagus hannah*) was also reported by the locals mostly around the *Tizü* river. The detailed list of faunal groups is in Annexure 4 to 9.

With regard to the other smaller fauna, villagers are well versed with those that are edible and have local names for them. Some of these fauna are listed in Table 9.

Table 9: List of Lesser Fauna

Sr. No	Common Name	Local Name	Whether Eaten
1.	Worm	Alapü	Yes
2.	Leech	Aiveli	No
3.	Flea	Ahi	No
4.	Mosquito	Akaomi	No
5.	Sand-fly	Ammü	No
6.	Horse-fly	Amüthü	No
7.	Butterfly	Amimi	No
8.	Firefly	Asüghao	No
9.	Fly	Ayelakhu	No
10.	Wasp, Bee	Akhi	Yes
11.	Grasshopper	Leotsü/ Atukha	Yes
12.	Spider	Talhakhü	Yes (Mostly *Nephila* spp. eaten)
13.	Aquatic Centipede	Alazha	Yes
14.	Aquatic Snail, slug	Tühnaqü/ Chokibo	Yes
15.	Scorpion	Achüwoh pa'za	No
16.	Ant	Alhache	Yes

Several of the species found at Ghukhuyi are of global or national significance such as restricted range species, globally endangered species or those protected under the Indian Wildlife (Protection) Act. This includes at least 26 species at village Ghukhuyi. These mainly include mammals like Sambar (*Cervus unicolor*), Mithun (*Bos frontalis*), Malayan Sun Bear (*Helarctos malayanus*), and Asiatic Black Bear (*Ursus thibetanus*) which fall under the *'vulnerable'* category, while the Wild Dog or Dhole (*Cuon alpinus*) and the Fishing Cat (*Prionailurus viverrinus*) fall under the *'endangered'* category and the Chinese Pangolin under the '*Critically Endangered'* category of the IUCN Red Data list (IUCN, 2015).

Amongst butterflies, Green Sapphire (*Heliophorus moorei tytleri*), Pointed Ciliate Blue (*Anthene lycaenina lycambes*), Pea Blue (*Lampides boeticus*), Common Gem (*Poritia hewitsoni*), Common Baron (*Euthalia aconthea garuda*), Common Albatross (*Appias albina darada*) are listed under schedule II, while the Striped Blue Crow (*Euploea mulciber mulciber*) falls under schedule IV of the Indian Wildlife (Protection) Act (WPA). Amongst reptiles, the King Cobra (*Ohpiophagus hannah*), and the Burmese Python (*Python bivittatus*) fall under the 'Vulnerable' category of IUCN while Monocoled Cobra (*Naja kaouthia*) is included in the scheduled species list of the WPA.

A number of fish species found in the Tizü River that flows along the boundary of Ghukhuyi CCA are rare and are included in the IUCN Red Data List. These include *Neolissochilus hexagonolepis, Tor tor* and *Schistura manipurensis* that are *'*near threatened*,' Devario acuticephala; Devario naganensis, Schizothorax richardsonii, Schistura nagaensis and Schistura prashadi* which are 'Vulnerable' and *Tor putitora* which is 'Endangered'.

Plants of economic importance

Several plant species are economically important to the local people and are sold for timber or fuel wood. The documented list (Table 10 and Table 11) comprises 30 timber species that are of the utmost importance to the villagers. The timber species are divided into Class A, B and C depending on their quality which in turn leads to price variation. Wood is measured in a local unit called a 'safety or Thak', and the cost of 1 Thak is approximately equal to INR 350. The different price range available are INR 9000 per mini-truck of class A of fuelwood, INR 7000 per mini-truck of class B of fuelwood and INR 5000 per minitruck of class C of fuelwood.

Table 10: List of plant species of economic importance

Sr. No.	Sema Name	Common Name	Botanical Name	Family	Sale price (INR)	Class (Category)*
1.	Milisu	Bonsom	*Phoebe goalparensis, Hutch*	Lauraceae	650	A
2.	Khusu	Hollock	*Terminalia myriocarpa, Heurek et Mell.*	Combretaceae	580	A
3.	Tsughusu	Gamar	*Gmelina arborea, Linn.*	Verbanaceae	650	A
4.	Azuyisu	Choroi/Koroi (Black Siris)	*Albizzia odoratissima, Benth.*	Mimosaceae	500	A
5.	Atsutsosu				500	A
6.	Ghakusu	Walnut	*Juglans nigra*, Linn	Juglandacea	500+	A

Sr. No.	Sema Name	Common Name	Botanical Name	Family	Sale price (INR)	Class (Category)*
				e		
7.	Muwosu				650	A
8.	Angusu	Nahar	*Mesua ferrea L.*	Calophyllaceae	650+	A
9.	Achighisu	Tita Chope/Tita sopa	*Michelia champaca, Linn.*	Magnoliaceae	650+	A
10.	Sahusu	Pine	*Pinus kesiya* Royle ex Gordon	Pinaceae	600+	A
11.	Achehesu	Badaam (Almond), Pahaari Badam	*Mansonia dipikae, Kanjilal.*	Sterculiaceae	600+	A +
12.	Kholesu				400+	B
13.	Khotsusu				400+	B
14.	Kinilhosu				400+	B
15.	Shekuthisu				400	B
16.	Moausu				400	B
17.		Jayopoma/jiapoma	*Lannea coromandelica* (Houtt.) Merr (syn *L. grandis*)	Anacardiaceae	400	B
18.		Bochipoma/bogipoma	*Chukrasia velutina,Wt.&Arn. (*C. tabularis*)*	Meliacae	400	B
19.	Khukhusu	Semal	*Bombax ceiba L.*	Malvaceae	360	B
20.	Cholikhamosu				400+	B
21.	Shedusu				450	B+
22.	Litsasu				400	B
23.		Barapat/Borpat	*Ailanthus grandis, Prain.*	Simaroubaceae	400	B
24.	Tughusu				360	B
25.	Lutusu				360	B
26.	Yapasu				360+	B
27.	Awchkhachebosu				360	B

Sr. No.	Sema Name	Common Name	Botanical Name	Family	Sale price (INR)	Class (Category)*
28.	Tsuzhasu				360	B
29.	Michisu	Gogura	*Schima wallichii* Choisy	Theaceae		B+
30.	Awunhechesu					B+

Note: Timber is of A and B class. + means slightly more than the number listed.

Table 11: List of Bamboo species of economic importance

Sr. No	Local Name	Scientific name	Description by locals
1.	Achegho		Same size as *bambusa tulda*
2.	Akulu		Used for making flute in the olden days
3.	Ammah		
4.	Aphobo	*Dendrocalamus latiflorus*	
5.	Apibo	*Bambusa tulda*	Thick bamboo with small hole
6.	Apiqu		Very Slippery
7.	Atsuteh		
8.	Awitibo	*Bambusa balcooa*	
9.	Awuyi		
10.	Ayeghü		Bbranches used for broom
11.	Ayichepu		Very small
12.	Ayichi		Bigger tha Ayichi found in deep forest
13.	Ayicho		
14.	Ayihu		
15.	Kulchuhabo		
16.	Nunnah		Used mostly as walking stick
17.	Shihu		Best bamboo for handicraft
18.	Tughakhahu	*Dendrocalamus hamiltonii*	
19.	Türübo		

Wild Meat and Hunting

Wildlife hunting is an age-old practice and humans have been hunting wild animals for many generations. Wildlife is an important resource for those communities that live in and around forests and is exploited for various reasons, including food, additional income,

cultural practices and as a sport. Over the last few decades the extraction of wild meat has become a serious concern globally as hunting leads to the extinction of wildlife populations (Bennett et al., 2002; Robinson & Bennett, 2000).

In the state of Nagaland, hunting was the primary mode of subsistence till shifting agriculture was adopted. Hunting continues to play an important role in the socio- and cultural life of the Naga. The popular tradition of hunting amongst the Nagas promotes and upholds clan and family relationships as people hunt together, and share the game on different occasions. For instance, even today among the various tribes of Nagaland, the hunters take pride and honour in decorating their houses with the skulls of hunted animals and birds- a sign of their hunting prowess. Hunting is a culturally embedded practice in the Naga way of life, and apart from helping to strengthen clan and family ties, is used to honour guests who are welcomed with hunted game. Wild meat is an important source of protein and a livelihood source as hunted game is sold to meet the other needs of the family. Yet another practical reason for hunting, among the Nagas whose mainstay of the economy is agriculture, is to prevent wild animals and birds from damaging agricultural crops. Hunting also helps to carry on the traditional knowledge of techniques, practices and trapping methods that have been passed down for centuries, thus fostering the continuance of this ancient practice (Lohe, 2014).

Naga tribes continue to hunt and trap using different traditional and ingenious traps and techniques, and increasingly, the gun. Hunting in the past was often a test physical endurance as different hunting methods were employed. The techniques of hunting, including the use of different types of trapping methods are often region-specific, closely linked to the topography, and the social and economic systems in place. There are various instances and ways of hunting documented by historians. Some of the practices documented by Hutton (1921) in his book on the Sema Naga are detailed below.

"Various type of trapping methods used by Sema Nagas includes aitho, used for deer; ashepu, another of the same type; and sügŏtsa, used for snaring pheasant, partridge, and other birds. Of traps and snares the Semas use the pitfall (akhwo), digging a pit, putting long " panjis " at the bottom, and covering the top with light brushwood, thin sticks of reeds, etc., sprinkled with earth and thickly covered with dead leaves. The fall trap (heka) is used in the fields for monkeys and baited with a cucumber. When the monkey pulls at this a bamboo shelf loaded with stones falls down and flattens him."

Similarly, different ways of fishing used by Sema Nagas include;

1. *Fishing by weirs (akhu), in which the fish are caught in baskets facing upstream and inserted in holes in a weir built across the river of stones, sticks, bamboos, and mud. This method is probably practiced by all Semas within reach of any large river*
2. *Fishing with the rod. This method is universal and consists in attaching a fine of twisted fibre to the tapering end of a light bamboo, and an iron hook (usually of umbrella wire) to the end of the line.*
3. *Fishing with a net. There are three sorts of nets, the large drag-net (shithi), the small drag-net (akhame), and the landing-net (akhasho). The shithi needs a dozen men to drag it, while akhame can be worked by four men. The hand-net, Akhasho, is used generally in conjunction with some other method of fishing, but in muddy water, when a flood is subsiding and the fish are rising and feeding freely.*

Community Fishing (*Ayichikuvu*)

For centuries Naga communities especially Lothas and Semas have been practising community fishing (

Image 25).. Every year in March-April, neighbouring villagers from the two tribes converge to observe this age old practice believed to foster good ties.., Two Sema Naga villages – Kitami and Ustomi – in Zunheboto district of Nagaland have put a complete ban on all kinds of chemicals and electric current usage. Instead they organise an event of community fishing once a year. The details of the event as noted by Shanthungo Ezung are as follows:

The villagers participating in the event collect and accumulate the bark of one particular tree locally called Ghakusuyiko. Every adult man in the family has to have one roll of that bark to crush to dissolve in the river water in the community fishing event. It is also mixed with Ayichi which is obtained from roots of a local plant called Ayichi and also mixed with ash. Before crushing the bark to dissolve in the river water, the villagers arrange about 50 big logs and place them in the middle of the river in the row. As the men gather around the rows of log armed with bamboo sticks, an elderly man invokes God's blessing. The men then raise their sticks up high and a war cry is sounded, signalling the start of the ceremony. As the ceremony progresses, the men of the village beat the roots of a particular tree onto the logs of wood in an almost synchronised manner. This releases the juice/sap into the river- the juice acts as a sedative to demobilize the fishes. The fish so demobilized is then collected and handed over to the womenfolk, who had been waiting by the riverside to prepare the oft anticipated lunch.

Ghukhuyi village which is a part of the 'Tizü valley biodiversity conservation and livelihood network' used to celebrate this event with its neighbouring villages Suthotsu (earlier called Nuhato) and Thihepu (which was earlier called Ahepu). However, now in order to conserve the aquatic fauna of the river, this event has been cancelled by the respective village councils.

Image 25: Community Fishing (Source: www.facebook.com/discovernagaland)

In recent years, the use of guns has become increasingly common, and popular with easier and higher probabilities of catching prey than hunting with the dog, spear and catapult. The

muzzle-loading gun is commonly used by hunters which are locally made, and present in almost every household of the hunter community. However, this has led to rapid depletion of wildlife with many species on the brink of local extinction. Similarly, aggressive ways of fishing, like use of poisons (use of bleach and lime powder), dynamite and electrocution using battery packs has also led to reduction in fish populations of the Tizü flowing along the boundary of Ghukhuyi CCA. The fear of losing all the fish and the natural ecosystem is one of the reasons leading to the declaration of the reserve area by the people of Ghukhuyi.

The species of animals hunted by the people along with their uses were documented (Table 12). Several species are of medicinal and of ornamental value However, after the declaration of the CCA there has been a complete ban on hunting of all species within the CCA area.

Table 12: Documented use value of wild fauna

S. No	Common Name	Scientific Name	Local Name	Present Status	Used as
1.	House (Grey Musk) Shrew	*Suncus murinus*	Ajitshu	Common	Not eaten or used in any way
2.	Field mouse	*Mus booduga*	Aghalo	Common	Not eaten or used in any way
3.	Greater Short-nosed fruit Bat	*Cynopterus sphinx*	Ashuqha	Common	Not eaten or used in any way
4.	Lesser Short-nosed fruit Bat	*Cynopterus brachiyotis*	Ashuqha	Common	Not eaten or used in any way
5.	Rhesus Macaque	*Macaca mulatta*	Ashüki	Uncommon	The bitter liver is used as medicine
6.	Slow loris	*Nycticebus coucang*	Kujokini shuki	Uncommon	Eaten
7.	Wild Dog	*Cuon alpinus*	Atine	Rare	Eaten, good for pregnancy
8.	Malayan Sun Bear	*Helarctos malayanus*	Ava	Rare	Bile was sold earlier. Meat Eaten
9.	Asiatic Black Bear	*Ursus thibetanus*	Ava	Rare	Bile was sold earlier. Meat Eaten
10.	Leopard Cat	*Prionailurus bengalensis*	Anghshü	Uncommon	Meat is eaten, skin used for decoration
11.	Jungle Cat	*Felis chaus*	Yeghili	Rare	Eaten
12.	Fishing Cat	*Prionailurus viverrinus*	Anengü	Rare	Eaten
13.	Large Indian Civet	*Viverra zibetha*	Aqhü	Uncommon	Meat eaten-more oily in winter
14.	Himalayan Palm Civet	*Paguma larvata*	Aküfü	Rare	Meat eaten-more oily in winter

S. No	Common Name	Scientific Name	Local Name	Present Status	Used as
15.	Eurasian Otter	*Lutra lutra*	Achieghe	Rare	Eaten. The claws are used to clear the bone of fish stuck in the throat.
16.	Yellow-throated Martin	*Martes flavigula*	Akhetsii	Uncommon	Used for asthma in form of soup
17.	Small Indian Mongoose	*Herpestes javanicus*	Kighiu	Uncommon	
18.	Ferret Badger	*Melogale spp*		Rare	Meat Eaten.
19.	Wild Boar	*Sus scrofa*	Amini	Common	Meat is eaten
20.	Sambar	*Rusa unicolor*	Aqhü	Uncommon	It is eaten and the antlers are used for ornamentation
21.	Barking Deer	*Muntiacus muntjak*	Ashe	Uncommon	Tasty and preferred food
22.	Red Serow	*Capricornis rubidus*		Rare	
23.	Goral	*Naemorhedus goral*	Achüyi	Uncommon	Eaten and antlers were earlier sold in Burma
24.	Mithun	*Bos frontalis*	Avi ala	Common	Meat eaten and the horn is kept as a trophy
25.	Hoary-bellied Squirrel	*Callosciurus pygerythrus*	Akili	Common	Common and available. Eaten
26.	Chinese Pangolin	*Manis pentadactyla*	Ashiphi	Rare	Sold to Burmese traders. Cost of 1 Kg scales amount to Rs 13 thousand.
27.	Orange-bellied Himalayan Squirrel	*Dremomys lokriah*	Sakhükili	Common	Common and available. Eaten
28.	Himalayan Striped Squirrel	*Tamiops macclellandi*	Azügha	Uncommon	Eaten
29.	Red Giant flying squirrel	*Petaurista peturista*	Atulo	Rare	Eaten
30.	Hoary Bamboo Rat	*Rhizomys pruinosus*	Achighi	Common	To treat headaches. The front incisors are chipped and a drop of blood which is

S. No	Common Name	Scientific Name	Local Name	Present Status	Used as
					withdrawn from the rat and then put on the head of the pateint to relieve fever and headaches. It is also used during delivery to help in blood clotting. Weakness and TB are treated with the soup of the rat
31.	Asiatic Brush-tailed Porcupine	*Atherurus macrourus*	Kithicheqü	Rare	Stomach contents are dried and stored and are good for cough
32.	Himalayan Crestless Porcupine	*Hystrix brachyura*	Acheqhü	Rare	Stomach contents are dried and stored and are good for cough
33.	*Asian Elephant	*Elephas maximus*	Ahü	Locally Extinct	More than 1 lakh is paid for ornaments made from the tusks (from Dimapur)
34.	*Hoolock Gibbon	*Hylobates hoolock*	Akuhu	Locally Extinct	Eaten

Some of the observations with regards to eating of bushmeat, documented by Hutton (1921) in his book on the Sema Naga are detailed below.

Of wild animals (Teghashi, — " Spirit flesh" or "jungle flesh ") the following are eschewed, (a) on account of natural repugnance to the idea of eating them: —The tiger, leopard, and larger cats. The tiger and leopard are regarded as closely akin to man and to eat them would be almost cannibalism. The larger cats are also usually classed generically as "tigers" (Angshu) and fall into the same category. The test is roughly whether or not the cat in question is called Angshu or not. Thus the little leopard cat, Anyengu (Felis bengalensis), is eaten, while the cat called Angshu-akinu (? Felis aurata) is not.

Rats and mice generally (Azhi), except the bamboo-rat called Acheghi, a member of the Rhizomys family which lives among the roots of "okra." To this medicinal properties are attributed and it is universally eaten. The water-rat, Azhukhu, is not ordinarily eaten, but is sometimes resorted to as a cure for dysentery. A rat called Azhuyeh (or Azhichu, "Edible rat ") is eaten by many and by all if they have stomach-ache.

Bats (Ashuka). The reason given for abstention is that they are like mice.

Those abstained from because of the fear of them acquisition of their qualities by consumption is: —

The flying squirrels (Attolo, Asiiki), because they are "idiot," and the eaters would therefore be liable to beget idiot children. They are probably regarded as idiot because they sleep in the day and come out at night, just as the Cheshire cat was mad because she did the opposite of the dog which was admittedly not so.

The huluk ape ^ (Akuhu) is abstained from by some though not all Semas on the ground that its consumption would render the eater liable to beget children who kept crying "hualu, hualu, hualu," like the ape. It may, like the flying squirrels, always be eaten by old men.

The otter, Achegeh, is eaten, but it is believed that this causes the hair of the head to become hard and dry and difficult to shave, because it dries as fast as it is wetted.

The musk-rat (Keghu) is not eaten, but its singed hair is used sometimes as a remedy for a long illness, being mixed with water in which the sick man washes in the forlorn hope that the sickness may be frightened from his body by the horrible smell of the musk-rat. The list of birds not eaten is a larger one.

In the case of wild animals women seem to be generally restricted to the meat of the serow, deer, pig, porcupine, bear, and the bamboo-rat, while of domestic animals besides the cat, women may not eat of the goat, for fear of becoming libidinous, nor of chickens that lay here and there in different places, lest they should become unfaithful and light-o'-love. They may not eat either of any animal that dies in giving birth (no doubt for fear that they should do likewise), or of the flesh of any animal killed by a wild beast.

Chapter VI: The Community Conserved Area of Ghukhuyi village

Community Conserved Areas can be loosely described as," natural and/ or modified ecosystems containing significant biodiversity values and ecological services, voluntarily conserved by (sedentary and mobile) indigenous and local communities, through customary laws or other effective means (The IUCN World Parks Congress of 2003, as cited in Corrigan and Granziera, 2010)." These include ecosystems under minimum as well as substantial human influence[33].

Conservation efforts by communities include continuation of traditional conservation and sustainable-use practices, revived and/ or modified traditional practices, or completely new initiatives taken up by the communities when faced with external or internal threats to their resources or their access to the resources.

Pathak and Kothari (2005) identified rampant and unregulated timber extraction as the key reason for rapid degradation of the virgin forests of Nagaland, particularly in privately owned forests. In Nagaland, rampant and unregulated hunting has seriously depleted wildlife populations. Many of the hills that were blanketed by thick forests have been deforested. The treasured hornbill feathers and beaks that wealthy people wore as head-gear have now become even more precious because of their unavailability. Almost all that is left of the hornbill today in Nagaland is the annual hornbill festival which commemorates this charismatic bird now rarely sighted in the forests.

Conservation Efforts in Nagaland

According to Pathak and Kothari (2005), community conserved areas (CCAs) in Nagaland range from completely inviolate zones to multiple-use zones. Further, they identify different systems adopted by villages for conservation which are described below.

Forest reserves

Forest reserves are declared for various reasons: to preserve water sources of the village, to obtain a sustained supply of biological resources, or as buffer zones for a more strictly protected area. Hunting is allowed in some cases, not in others.

Wildlife reserves

Wildlife reserves are completely inviolate zones where all kind of hunting, fishing and biomass collection is strictly prohibited. Most wildlife reserves can be easily distinguished from the other forests by their appearance, as well as the sounds and signs of birds and other animals.

Wildlife reserves as core areas with forest reserves as buffers

One of the best-known examples of this kind of effort is Khonoma village. The village declared a 20 sq. km area as a Nature Conservation and Tragopan Sanctuary in 1998, where absolutely no hunting or resource use is allowed. The sanctuary is surrounded by a clan forest, which is much larger in area and is considered as a buffer to the sanctuary. No

[33]Pathak, N, S Chowdhury and R Bandekar (in press), Directory of Community Conserved Areas in India, Kalpavriksh, Pune, India.

hunting and extraction except wild fruits and vegetables and one truckload of firewood per family per year is permitted from this zone.

Wetland reserves

In some villages such as Ghukiye, Lozaphuhu and Chishlimi, villagers on their own, or with other neighbouring villages, have formulated well-defined rules and regulations for fishing in wetlands such as river stretches. These rules restrict use of explosives, chemicals and electricity for fishing.

Latest news on implementing bans include Sosinyu and Gwachonlo Villagers' Youth Organization (TGVYO) and Khezhakeno Village Council (KVC) from Phek district, who in separate notifications have informed that it has banned hunting and fishing within its jurisdiction. Also Chumukedima Village Youth Society (CVYS) has resolved to strictly ban all kinds of hunting and fishing in and within the village jurisdiction and warned that violators would be fined up to INR 1 lakh depending on the severity of the violation/ damages. The Wokha Village Council (WVC) has resolved to strictly ban hunting and trapping, starting April 1, 2017, and also prohibited taking away of any forest medicinal products such as flora and fauna from Mt. Tiyi Reserved Forest. The Southern Angami Youth Organization (SAYO) has "Totally banned" the hunting, collecting of medicinal plant and setting up of wildfire- burning of jungle within its jurisdiction.

Seasonal bans on hunting

Bans on seasonal hunting, particularly during the breeding season, is another practice adopted in many districts. February to May is the most active hunting season, as agricultural responsibilities are few. Villagers in favour of a seasonal hunting ban feel that such bans are more effective to start with, as a complete ban would be difficult to adhere to and would antagonise people. Some villages such as Ghukhuyi have selectively banned certain kinds of hunting tools such as air guns, which are considered to be harmful when used irresponsibly.

Complete ban on hunting

The villages in the Tizu Biodiversity Conservation and Livelihoods Network have banned hunting in the entire village through the year. There are occasional incidents when villagers go to other areas and hunt, but at the same time there is a growing realization that it is unfair to do so.

Biodiversity Conservation in Ghukhuyi village

Sema, a head-hunting tribe of Nagaland have been documented to inhabit Ghukhuyi village in the late 18th century. Men of Ghukhuyi village are efficient in hunting; as young children they learn to use the catapult, air guns, and to lay animal traps. The elders of the village have vivid memories of hunting endangered wildlife such as the elephant (*Elephas maximus*), tiger (*Panthera tigris*) and Stump-Tailed macaque (*Macaca arctoides*). However, with time the local biodiversity has dwindled. It is increasingly difficult for the villagers to land a catch, especially big fish from Tizü River which was once flourished in aquatic biodiversity. The current state of aquatic wildlife in Ghukhuyi is attributable to the adoption of unsustainable hunting practices such as use of explosives, chemicals and electric currents for fishing. The local people now recognize how precarious the situation is both for fish and for wildlife populations. Moreover, areas for conserving wildlife are now easier to set aside as the village requires less jhum land than before. In addition, the local people want this area to

become an important centre of ecotourism and hope that the CCA would in the long run help generate local livelihoods from ecotourism.

Increasingly cognisant of the escalating scale of the problem, and the importance of biodiversity conservation and sustainable management of resources, the villagers of Ghukhuyi have recently come together to adopt conservation practices. A resolution has been passed by Ghukhuyi Village Council in 2017 to conserve the "Tuzuqha, Kutu and Yayi including Azhoqha above Zhekiye- Satoi road" area of their forests (total area= 3.70 sq. km) which belongs to the village council, so as to safeguard the natural ecosystem including living and non-living resources and maintain it for present and future generations.

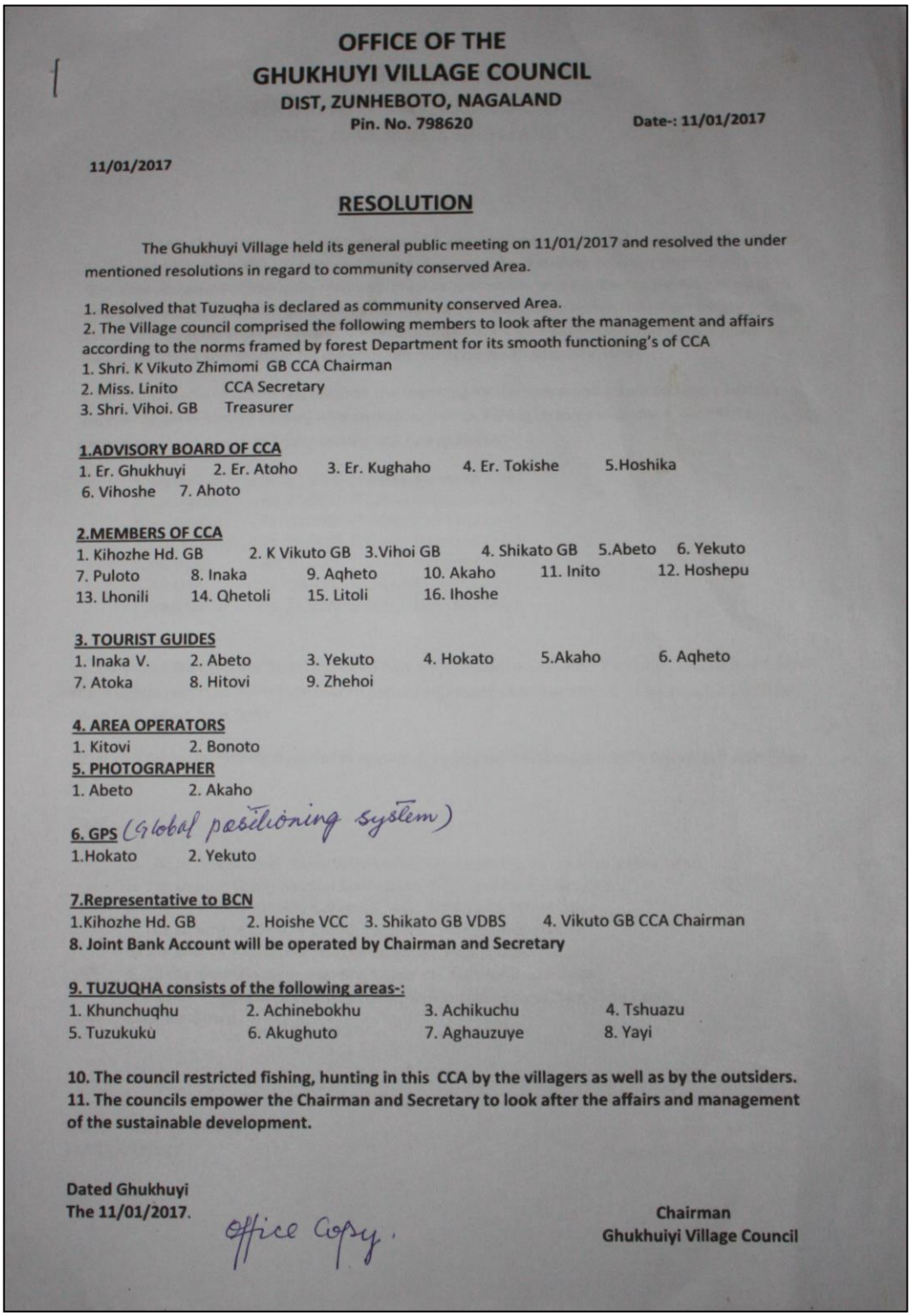
Conservation Practices in Ghukhuyi village

In Ghukhuyi, decisions relating to conservation are taken after considerable discussion. A biodiversity board has been constituted in 2017 to work towards Ghukhuyi's conservation effort. The final decision on wildlife reserves or other measures are taken only after approval from village elders and the village council (VC). The members of the board along with the citizens of the village undertake these conservation and sustainable use initiatives without any assistance from the government. To uphold the conservation agenda within Ghukhuyi, the village biodiversity board framed some rules, namely;

- A blanket ban on hunting wild animals and birds,
- A ban on fishing by use of explosives, chemicals and generators. Violation of this rule would result in the imposition of severe penalties and fines;
- Strict prohibition of jhum cultivation in the conserved area.
- Strict prohibition on collection of canes and other non-timber forest products from the CCA.

The biodiversity board has also notified a fine of INR 20000 on use of explosives or chemicals or generators and so on (Figure 9). The detailed copy of the resolution is provided in Figure 10 and Figure 11.

Figure 9: A display board of the fines imposed by Ghukhuyi village



OFFICE OF THE
GHUKHUYI VILLAGE COUNCIL
DIST, ZUNHEBOTO, NAGALAND
Pin. No. 798620 Date-: 11/01/2017

11/01/2017

RESOLUTION

The Ghukhuyi Village held its general public meeting on 11/01/2017 and resolved the under mentioned resolutions in regard to community conserved Area.

1. Resolved that Tuzuqha is declared as community conserved Area.
2. The Village council comprised the following members to look after the management and affairs according to the norms framed by forest Department for its smooth functioning's of CCA

1. Shri. K Vikuto Zhimomi GB CCA Chairman
2. Miss. Linito CCA Secretary
3. Shri. Vihoi. GB Treasurer

1.ADVISORY BOARD OF CCA
1. Er. Ghukhuyi 2. Er. Atoho 3. Er. Kughaho 4. Er. Tokishe 5.Hoshika
6. Vihoshe 7. Ahoto

2.MEMBERS OF CCA
1. Kihozhe Hd. GB 2. K Vikuto GB 3.Vihoi GB 4. Shikato GB 5.Abeto 6. Yekuto
7. Puloto 8. Inaka 9. Aqheto 10. Akaho 11. Inito 12. Hoshepu
13. Lhonili 14. Qhetoli 15. Litoli 16. Ihoshe

3. TOURIST GUIDES
1. Inaka V. 2. Abeto 3. Yekuto 4. Hokato 5.Akaho 6. Aqheto
7. Atoka 8. Hitovi 9. Zhehoi

4. AREA OPERATORS
1. Kitovi 2. Bonoto

5. PHOTOGRAPHER
1. Abeto 2. Akaho

6. GPS (Global positioning system)
1.Hokato 2. Yekuto

7.Representative to BCN
1.Kihozhe Hd. GB 2. Hoishe VCC 3. Shikato GB VDBS 4. Vikuto GB CCA Chairman

8. Joint Bank Account will be operated by Chairman and Secretary

9. TUZUQHA consists of the following areas-:
1. Khunchuqhu 2. Achinebokhu 3. Achikuchu 4. Tshuazu
5. Tuzukuku 6. Akughuto 7. Aghauzuye 8. Yayi

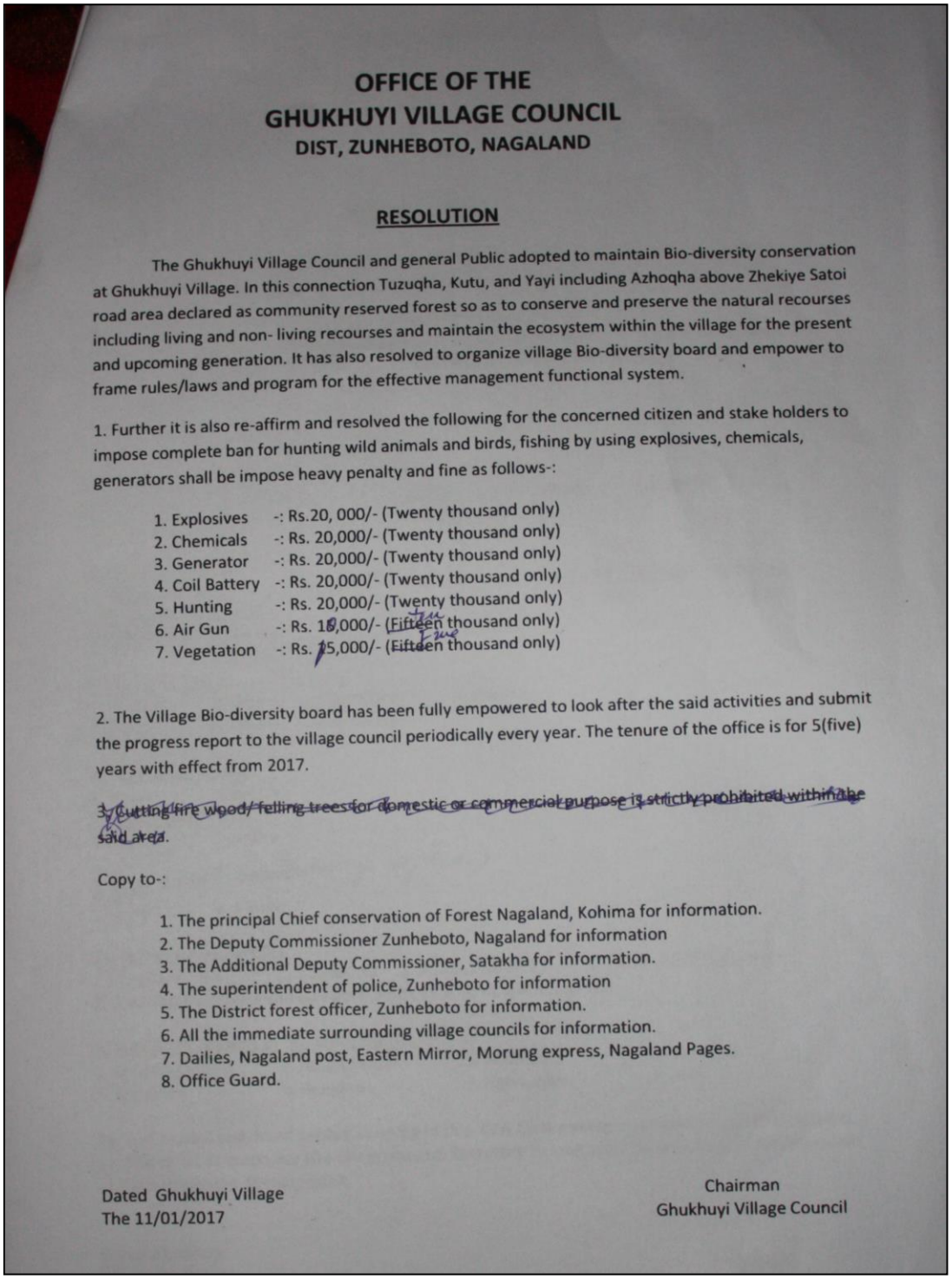
10. The council restricted fishing, hunting in this CCA by the villagers as well as by the outsiders.
11. The councils empower the Chairman and Secretary to look after the affairs and management of the sustainable development.

Dated Ghukhuyi
The 11/01/2017.

Office Copy.

Chairman
Ghukhuiyi Village Council

Figure 10: The resolution adopted by Ghukhuyi village



OFFICE OF THE
GHUKHUYI VILLAGE COUNCIL
DIST, ZUNHEBOTO, NAGALAND

RESOLUTION

The Ghukhuyi Village Council and general Public adopted to maintain Bio-diversity conservation at Ghukhuyi Village. In this connection Tuzuqha, Kutu, and Yayi including Azhoqha above Zhekiye Satoi road area declared as community reserved forest so as to conserve and preserve the natural recourses including living and non- living recourses and maintain the ecosystem within the village for the present and upcoming generation. It has also resolved to organize village Bio-diversity board and empower to frame rules/laws and program for the effective management functional system.

1. Further it is also re-affirm and resolved the following for the concerned citizen and stake holders to impose complete ban for hunting wild animals and birds, fishing by using explosives, chemicals, generators shall be impose heavy penalty and fine as follows-:

1. Explosives -: Rs.20, 000/- (Twenty thousand only)
2. Chemicals -: Rs. 20,000/- (Twenty thousand only)
3. Generator -: Rs. 20,000/- (Twenty thousand only)
4. Coil Battery -: Rs. 20,000/- (Twenty thousand only)
5. Hunting -: Rs. 20,000/- (Twenty thousand only)
6. Air Gun -: Rs. 15,000/- (Fifteen thousand only)
7. Vegetation -: Rs. 15,000/- (Fifteen thousand only)

2. The Village Bio-diversity board has been fully empowered to look after the said activities and submit the progress report to the village council periodically every year. The tenure of the office is for 5(five) years with effect from 2017.

3. ~~Cutting fire wood/ felling trees for domestic or commercial purpose is strictly prohibited within the said area.~~

Copy to-:

1. The principal Chief conservation of Forest Nagaland, Kohima for information.
2. The Deputy Commissioner Zunheboto, Nagaland for information
3. The Additional Deputy Commissioner, Satakha for information.
4. The superintendent of police, Zunheboto for information
5. The District forest officer, Zunheboto for information.
6. All the immediate surrounding village councils for information.
7. Dailies, Nagaland post, Eastern Mirror, Morung express, Nagaland Pages.
8. Office Guard.

Dated Ghukhuyi Village
The 11/01/2017

Chairman
Ghukhuyi Village Council

Figure 11: The resolution adopted by Ghukhuyi village

GIS-based mapping of the Community Conserved Area

In Nagaland the problem of fragmentation of land holdings is not an issue on account of the peculiar pattern of land-ownership, tenure and use prevalent in the state.

The ownership of land and the individual rights are governed by customary laws of the community. These customary laws are un-codified, and yet very effectively applied and interpreted by the traditional village councils in the event of dispute. Due to the unique ownership and management system of the Nagas, there is little or no alienation of the people from their land and resources.

The Tuzuqha, Kutu and Yayi forests identified by the people of Ghukhuyi, belongs mostly to the Village Council. The demarcation of the boundaries of the community conserved area is governed by the rules of customary law. This forest land whose boundaries are known to the Village Council of Ghukhuyi and the Village Councils of other neighbouring villages is protected, and the locals abide by the rules. A detailed survey of the boundaries of the community conserved area of Ghukhuyi was undertaken by TERI along with the village community, based on which a GIS-based map of the area has been prepared. The total area of community conserved area sums according to 3.70 sq. km. Figure 9 provides the map of the CCA area along with the Ghukhuyi village.

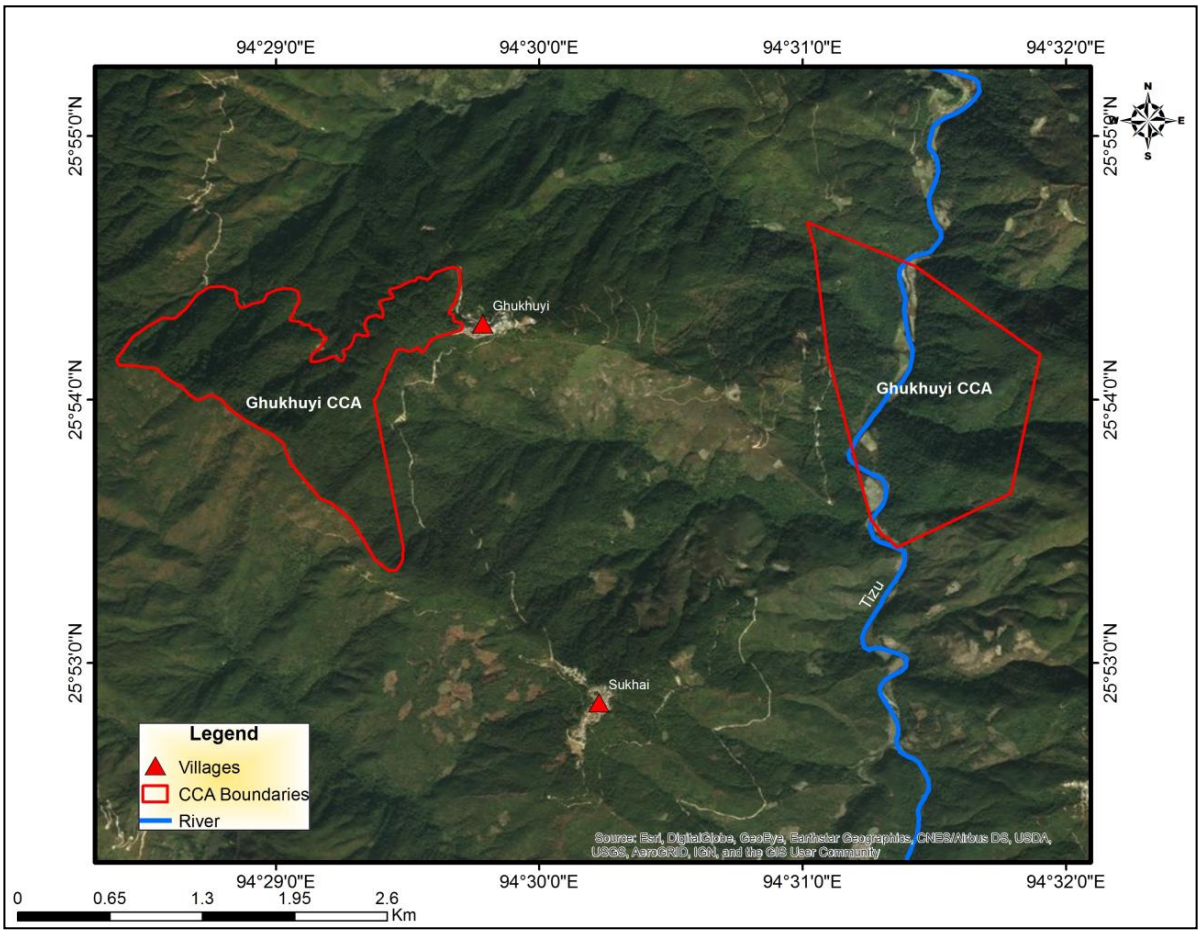


Figure 12: The Community Conserved Areas of Ghukhuyi village

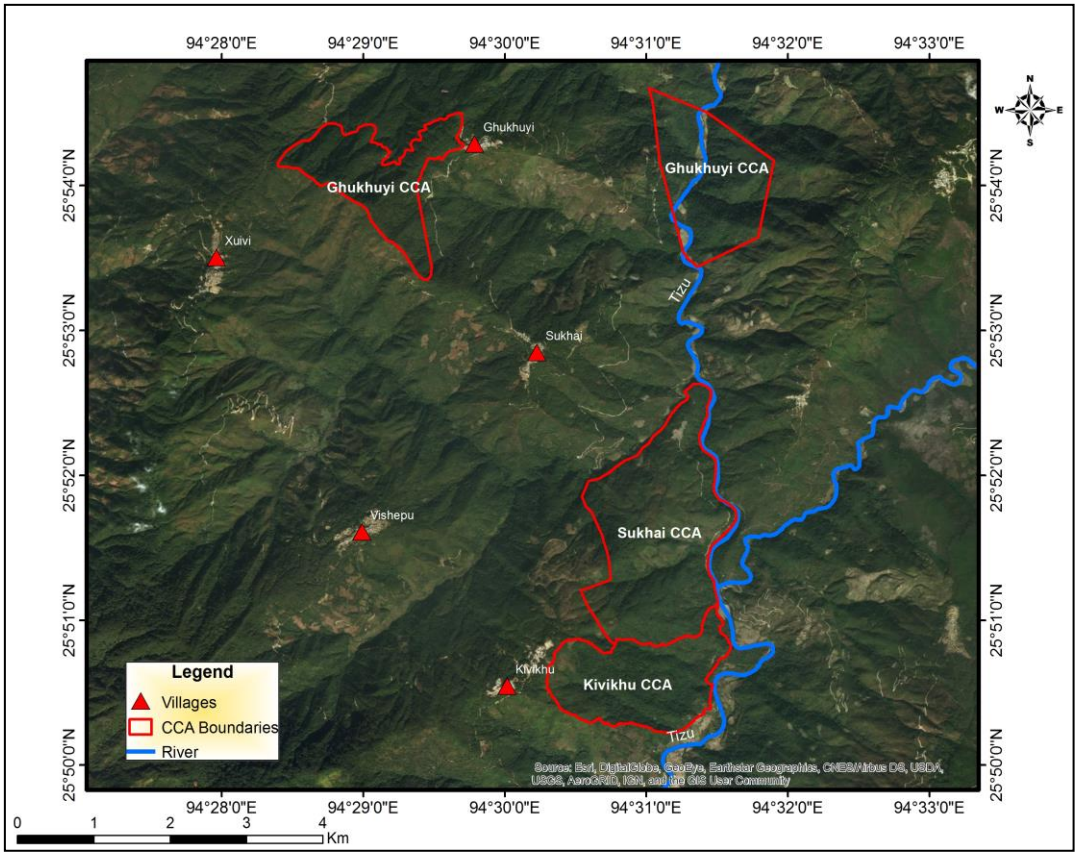


Figure 13: The Community Conserved Areas of Ghukhuyi village along with CCA's of Sukhai and Kivikhu village

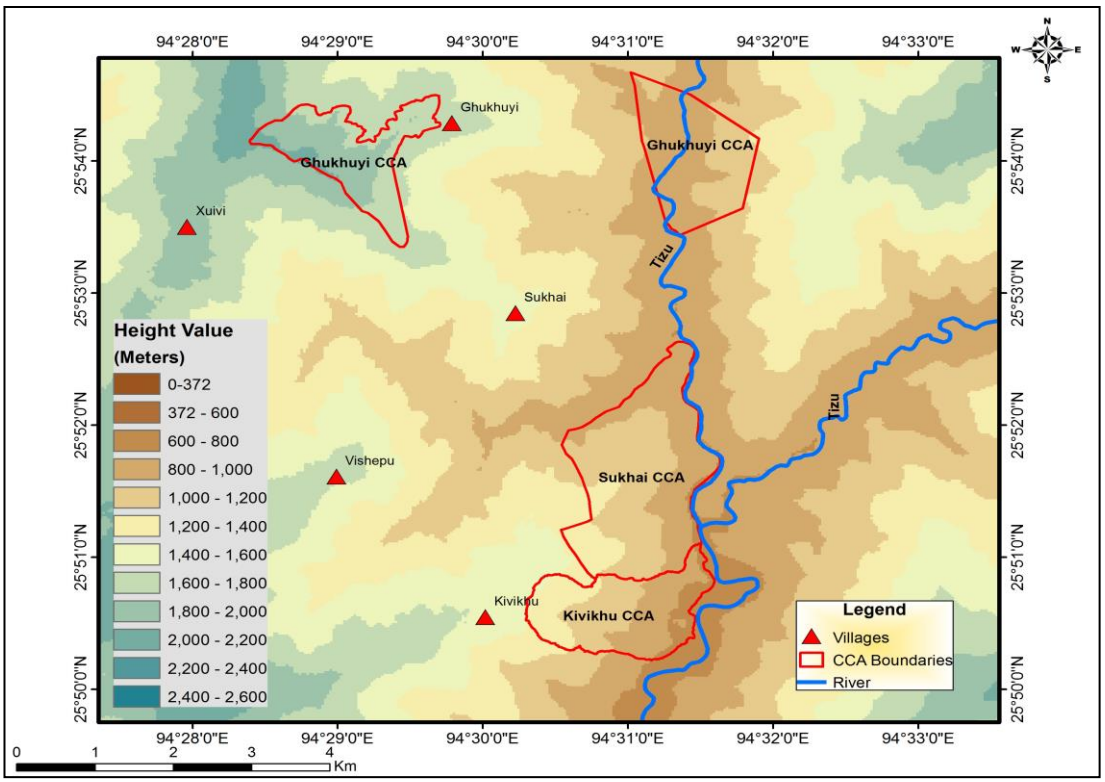


Figure 14: The Contour map of Ghukhuyi village along with CCA's of Sukhai and Kivikhu village

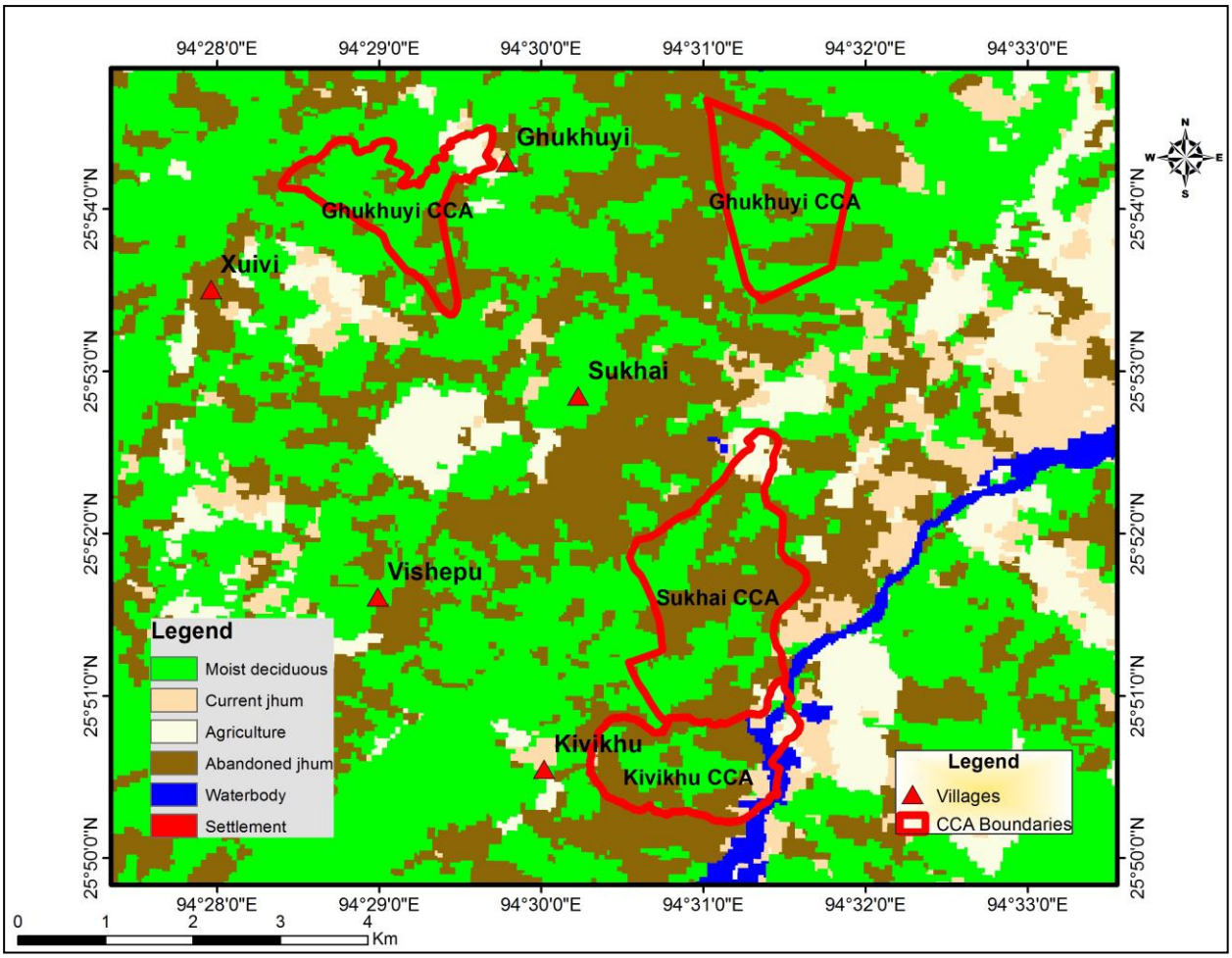


Figure 15: The land use/ land cover map of Ghukhuyi CCA along with CCA's of Sukhai and Kivikhu village

Factors for Biodiversity Conservation in Ghukhuyi

Several factors were observed to play a role in contributing to conservation, as well as in impeding conservation in Ghukhuyi village.

High out-migration

Ghukhuyi has a high out-migration rate, with 19% population staying out of village permanently and 66% of population having alternate homes in nearby towns of Sataka, Zunheboto or cities like Kohima and Dimapur. Village children soon after completion of their primary education are sent to towns or cities to complete their schooling and higher education. Trained in tertiary sector jobs, the youth of Ghukhuyi are motivated to continue to live in towns or cities with better job opportunities. This has reduced the need for lands under jhum cultivation as well as other resources derived from the forests including hunted wildlife and non-timber forest products. In such abandoned jhum patches, the forest can be seen to be regenerating forming patches of secondary growth forests.

Increase in the fallow period between jhuming cycles

Reduced pressure on natural resources due to declines in the population of Ghukhuyi has also positively impacted the Jhuming cycle. According to the elders of the village, the length of the jhuming cycle within Ghukhuyi has increased from twelve to twenty years. This allows the cleared jhum patches to regenerate and transition into dense, secondary growth forests.

Successful CCAs provide a positive role model for others

Several CCA initiatives undertaken by other villages such as those of Khonoma, and Sendenyu village of Kohima district, and Sukhai village of Zunheboto district are of some of the positive role models for the people of Ghukhuyi. Motivated by the success of these CCAs and the fame they have attracted, some Nagaland communities are now conserving a portion of their forests with enhanced fervour.

Perceived economic gains

Most households, especially the ones that have migrated out but who retain ties to their village, perceive the conserved area as an asset. One of the village members expressed the desire to convert his ancestral home into a tourist lodge with the hope that the Ghukhuyi conservation effort will succeed, and eventually attract a lot of tourists.

Factors impeding biodiversity conservation in Ghukhuyi

High dependence on natural resources

For the majority of households in Ghukhuyi, jhuming is an important source of income. For successful conservation initiatives it is important to create alternative source or to adopt measures to ensure sustainable harvests.

Hunting, a cultural acceptable practice

Hunting continues to be a major road block to the conservation of wildlife. The use of less destructive hunting methods, smaller populations and extensive forests coupled with traditional wise-use practices, protected wildlife in the past. Today, however, the use of

guns and the abandoning of many traditional wise-use practices have made wildlife increasingly vulnerable to local extinction.

Taste for wild meat

Wild meat forms an important part of the diet of people of Ghukhuyi. Although households all own domestic livestock, the Sema being a hunting tribe harbour a great preference for wild meat. This imposes a continued threat to wild animal populations.

Table 13: Factors contributing to, and impeding biodiversity conservation in Ghukhuyi village

Contributing factors	Impeding factors
• High out-migration, especially among youth of Ghukhuyi • Increase in number of Jhuming cycles from twelve to twenty • Successful CCAs provide positive role model • Perceived economic gains	• High dependence on natural resources • Hunting a cultural acceptable practice • Taste for wild meat • Trespassing by neighboring village

Conclusion and way forward

The people of Ghukhuyi village are largely dependent on forests and natural resources for their livelihood, agriculture and other commodities such as timber and firewood. Recognizing signs of depleting resources, the village council in consultation with village members has resolved to conserve area. The Village Council has imposed a complete ban on hunting and cutting of trees from the CCA, and use of chemical explosives and other harmful methods for fishing are prohibited. Some suggested measures to enhance management of the Ghukhuyi CCA are discussed below.

Conservation involving local communities is a process. To achieve conservation there is a need to generate greater awareness and build a common understanding of what conservation means and why and the initiatives leading to positive outcomes. The villages should understand that the trespassing of any CCA boundary is unfair, and the rules of another village or clan must also be respected.

People are reservoirs of knowledge on nature and traditional management practices, especially the village elders. High out-migration, and the increased motivation of village youth to engage in newer forms of livelihood while also bringing its own set of benefits, leads to the loss of traditional knowledge and practices. To sustain this knowledge it is important to document it before it is lost and to train younger community members. This can be achieved by building the capacity of local people, especially youth to develop and maintain People's Biodiversity Registers. The youth can also be encouraged to document the biodiversity of their forests, and to patrol such areas to ensure their conservation. The local school teachers must be trained to use these rich forests as their classrooms to teach their students about biology, culture, local folklore and science in general.

There is a need to create locally available alternatives to meet community requirements without impinging upon the natural ecosystem. In the case of Ghukhuyi for example, the village has natural water springs which provide an opportunity to develop fisheries within the village to meet their demand for fish, reducing their dependence on the Tizü River.

There have been examples across the globe of how religion can play an important role in conservation. The role of the church in inculcating a culture of conservation can prove beneficial in safeguarding and maintaining the forests and biodiversity of Nagaland. The forest department and church can work in tandem to advocate biodiversity conservation in each village, in addition to or along with the creation of community conserved areas.

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Appendix 1: Format for preparation of a village profile

Participant Profile

NAME	AGE	SEX

A. Geographical Location

S. No.		
1.	Name of the village	
2.	GPS coordinates of the village	Latitude Longitude
3.	Name of the Forest Range	
4.	Name of the Forest Division	
5.	Name of village council head and phone number	
6.	Name of nearby market and its distance from the village	
7.	Name of nearest Bank and its distance	
8.	Name of nearest town and its distance	
9.	Nearest National Highway and its distance	
10.	Nearest State Highway and its distance	
11.	Average elevation above MSL	
12.	Altitude (M):	
	Highest	
	Lowest	

B. Social Composition

13.	Total number of households in the village			
14.	Total Village Population			
15.	Total Male Population			
16.	Total Female Population			
17.	Age Composition	Total	Male	Female
	less than 1 year			

	1-5 years			
	5-14 years			
	14-18 years			
	18-21 years			
	21-50 years			
	50 years and above			
18.	**Name of Tribe(s) in the village**			
19.	**Clan details:**			
	Name of Clan	**Number of Houses**		
20.	**Khel Details**			
	Name of Khels	**Number of Houses**		
21.	**List of primary occupation**			
22.	**List of secondary occupation**			

Appendix 2: Format for village and resource mapping

VILLAGE AND RESOURCE MAPPING

NAME	AGE	SEX

DETAILS FROM RESOURCE MAP

S. No.	Code number of landscape from PRA map	Name of landscape	Ownership type	Service provided by landscape	Number of households dependent	Any change in the extent on service received since past 10 years	Reason for change	Management Practices	Other details	Inference for intervention

FOREST LAND DETAILS

	Details of forest land	Area	Flora/Fauna/NTFP	Change in flora fauna and NTFP in last 10 years	Reason for change	Details on Management
	Total Forest					
	CCA (Forest land)					

DETAILS OF MIGRATION

	Migration Type	Purpose	Number of Families	Number of people	Time	Duration	Benefits

	Outward migration						
	Inward migration						

SETTLEMENT and SOCIAL COMPOSITION

S. No.	Type of settlement (kutcha/semi kutcha and pucca household)	Location description	Number of household	Population	Clan/Khels	Change in Settlement and Social Composition in last 10 years	Reason for change

OCCUPATION

CLAN/KHEL	Families & Major Occupation	Sub-Occupation	Month	Depending Landscape	Major resources accessed and seasons of access	Landscape Management Practice (for common land)	Change in occupation in last 10 years	Reason for change	Resource Management Practice

C. STATUS OF BASIC AMENITIES IN THE VILLAGE

C.1 Health

Type of Heath Care institution	Number	Distance from the Main Village
GOVERNMENT		
Primary Health Centre		
Community Health Centre		
District Hospital		
Anganwadi Centre		
PRIVATE		

Nursing Home		
Dispensary		
Traditional Healers		

Details of Alternative medicine (if available within village)

C.2 Education

Institution Type	Number	Name	Distance from Main Village
Play School			
Nursery			
Primary School			
Secondary School			
High School			
College an Higher education (Bachelors/Diploma/Masters/any other degree)			

C.3 Water

Water bodies in the village

	Name of the water-body (Lake, tanks, streams, rivers)	Ownership	Area (approx.)	Use (irrigation/domestic)	Seasonality (months when water is available)
	No. of wells				
	No. of bore wells				

Change in availability of basic amenities

	In last 10 years	Reason for Change
Health Services		
Education Institution		
Water Resource		

Appendix 3: Format for Social Mapping of the village

FORMAT 3
SOCIAL MAPPING

S.No	Name of the head of the household	Clan Name	Total Family Members	Number of Migrant Members	Number of Males	Number of Females	Below 5 years	5-12 years	12-18 years	18-30 years	30-50 years	50 years and above

Appendix 4: Flora of Ghukhuyi CCA

Tree species

Sr. No	Scientific Name	Local Name
1.	Aghaupukhusu	*Morus laevigata*
2.	Aghishibo	*Luffa cylindrica*
3.	Aguzabo(Bet)	*Licuala spinosa*
4.	Akhusu	*Acmella oleracea*
5.	Akochi	*Triumfetta rhomboidea*
6.	Ambusu (Mujothi)	*Mangifera indica*
7.	Amiphisu	*Acer oblongum*
8.	Amubo(Mujothibo)	*Mallotus philippensis*
9.	Amughasu	*Canarium resiniferum*
10.	Anguzusu (Timur)	*Zanthoxylum acanthopodium*
11.	Anizasu	*Ocimum kilimandscharicum*
12.	Aphisu	*Quercus serrata*
13.	Asahwbo	*Pinus patula/Pinus caribae*
14.	Asakhu	*Acacia concinna*
15.	Atsushombo (Van haldi)	*Hedychium aurantiacum*
16.	Awunhechothisu	*Syzygium cumini*
17.	Awoxusu	*Zingiber offcinale*
18.	Awanhechothisu	*Prunus cornuta*
19.	Ayaghubo	*Amomum subulatum*
20.	Ayingu	*Cucumis spp*
21.	Ayepha	*Curculigo capitulata*
22.	Ayichi	*Bridelia species*
23.	Azuyisu	*Albizia lebbeck*

Sr. No	Scientific Name	Local Name
24.	Charithisu	*Prunus cerasoides*
25.	Chizusu	*Michelia champaca*
26.	Choghuthi (Ritha)	*Sapindus mukorossi*
27.	Ghakuthi	*Juglans regia*
28.	Hhanusu	*Kydia calycina*
29.	Kanak champa	*Pterospermum acerifolium*
30.	Khabosu	*Litsea citrata*
31.	Khachesu	*Wrightia tomentosa*
32.	Khashathisu / Khaghati	*Artocarpus chaplasha*
33.	Khalusu	*Salmalia malabarica*
34.	Khamoosu	*Litsea citrata*
35.	Khaukughusu	*Macaranga indica*
36.	Khanusu	*Bauhinia purpurea*
37.	Kheloni	*Pteropermum acerifolium*
38.	Kinilsanaho	*Sterculia urens*
39.	Kithimiqasu	*Oroxylum indicum*
40.	Kholesu	*Spondias axillaris*
41.	Kholethisu	*Emblica officinalis*
42.	Khonesu	*Kydia calycina*
43.	Khughuthi	*Ficus cunia*
44.	Khukasu	*Salmalia malabarica*
45.	Khukusu	*Bombax ceiba*
46.	Kilisanaha (Khagsa)	*Ficus hispida*
47.	Kithimikiqasu	*Oroxylum indicum*
48.	Kuhusu	*Duabanga grandiflora*

Sr. No	Scientific Name	Local Name
49.	Lutusu	*Alnus nepalensis*
50.	Lazasu	*Celtis eriocarpa*
51.	Lhatsusu	*Cinamomum spp*
52.	Litsasu	*Erythrina stricta*
53.	Mainsau	*Chukrasia tabularis*
54.	Michisu	*Schima wallichii*
55.	Mighesu	*Saurauia fasciculata*
56.	Milisu	*Morus laevigata*
57.	Miripisu	*Bauhinia variegata*
58.	Moosu	*Albizia stipulate*
59.	Motha	*Cyperus rotundus*
60.	Mubusu	*Ficus cunia*
61.	Mukhubo	*Rubus paniculatus*
62.	Murasusu	*Debregeasia velutina*
63.	Murupi	*Bauhinia varigata*
64.	Mutsutipisu	*Leucosceptrum canum*
65.	Nikesu	*Givotia rottleriformis*
66.	Pughusu	*Quercus spp.*
67.	Pogosu	--
68.	Sapotusu	*Albizia procera*
69.	Shedusu	*Bischofia javanica*
70.	Suchosthisu	*Ficus semicordata*
71.	Silikughusu	*Populus ciliata*
72.	Thanhesu	*Tectona grandis*
73.	Thochisu	*Callicarpa arborea*

Sr. No	Scientific Name	Local Name
74.	Thombosu	*Albizia chinensis*
75.	Thughusu	*Trema orientalis*
76.	Thumusu	*Rhus semialata*
77.	Thochisu	*Callicarpa arborea*
78.	Tsutsumilisu	*Cassia spp*
79.	Tsuzasu	*Phoebe goalparensis*
80.	Tuzusu	*Quercus incana*
81.	Tughusu	*Terminalia orientensis*
82.	Tung oil	*Vernicia fordii*
83.	Yaghasu	*Cateins spp*
84.	Yepasu	*Betula alnoides*
85.	Zunhesu	*Leucosceptrum spp*
86.	Achighusu	*TBI*
87.	Shinughasu	*TBI*
88.	Nhikosu	*TBI*
89.	AshenheKusu	*TBI*
90.	Pukhoti su	*TBI*
91.	Shekuthi su	*TBI*
92.	Awumughuthi	*TBI*
93.	Khumithisu	*TBI*
94.	Mughuthi	*TBI*
95.	Khaghathisu	*TBI*
96.	Nartosu	*TBI*
97.	Apuhasu	*TBI*
98.	Anga mubasu	*TBI*

Sr. No	Scientific Name	Local Name
99.	Chalebo	*TBI*
100.	Khotsusu	*TBI*
101.	Tsakolesu	*TBI*
102.	Tsukothisu	*TBI*
103.	Tughusu	*TBI*
104.	Sahusu	*TBI*
105.	Awuchinithisi	*TBI*
106.	Yaghasu	*TBI*
107.	Chokisu	*TBI*
108.	Nichisu	*TBI*
109.	Phinesu	*TBI*
110.	Xhoniyesu	*TBI*
111.	Chocholasu	*TBI*
112.	Ayithosu	*TBI*
113.	Achesu	*TBI*
114.	Mithikuthosu	*TBI*
115.	Lochixasu	*TBI*
116.	Ayikuniyesu	*TBI*
117.	Zhiqhathisu	*TBI*
118.	Angothibo	*TBI*
119.	Khitsuthibo	*TBI*
120.	Zhibathisu	*TBI*
121.	Tsungasu	*TBI*
122.	Kalahisu	*TBI*
123.	Chunithisu	*TBI*

Sr. No	Scientific Name	Local Name
124.	Kakasuthi	*TBI*
125.	Lapuse	*TBI*
126.	Japumasu	*TBI*
127.	Atuthusu	*TBI*

Note: TBI- To Be Identified

Shrub and Herb species

Sr. No	Local Name	Scientific Name
1.	Apughubo	*Laportea crenulata*
2.	Asakhu	*Acacia concinna*
3.	Atsushombo (Van Haldi)	*Hedychium aurantiacum*
4.	Ayaghubo	*Amomum subulatum*
5.	Ayingu	*Cucumis spp*
6.	Ayichi	*Bridelia species*
7.	Mukhubo	*Lantana camara*
8.	Japani grass	*Eupatorium odoratum*
9.	Kheloni	*Pterospermum acerifolium*
10.	Kinilosu	*Engelhardia spicata*
11.	Mukhubo	*Rubus paniculatus*
12.	Naaniye	*Clerodendrum colebrookianum*
13.	Boboloye	*Aconogonum molle*
14.	Apughu	*Laportea crenulata*
15.	Sulithi	*Rubus ellipticus*
16.	Yevuthi	*Rubus moluccanus*
17.	Topughabo	*Triumfetta rhomboidea*
18.	Asaqhubo	*Smilax spp*

Sr. No	Local Name	Scientific Name
19.	Aghishibo	*Luffa cylindrica*
20.	Aguzabo(Bet)	*Licuala spinosa (Cane sps)*
21.	Akochi	*Triumfetta rhomboidea*
22.	Ayepha	*Curculigo capitulata*
23.	Aghaulogi	*Melastoma malabathricum*
24.	Anhechhubo/ Ayemhi	*Rubia sikkimensis*
25.	Muqhuye	*Ambrosia spp*
26.	Apighikusu bo	*Arisaema tortuosum*
27.	Chitabo	*Bidens pilosa*
28.	Qhatsuyebo	*Crassocephalum crepidioides*
29.	Aghuye	*Centella sps*
30.	Atuye	*Diplazium esculentum*
31.	Losulonibo	*Mimosa pudica*
32.	Akikuchopubo	*Thysanolaena maxima*
33.	Kughukutsuye	*Plantago major*
34.	Khomiya	*TBI
35.	Angothiniye	*TBI
36.	Ayeqe	*TBI
37.	Chiye	*TBI
38.	Kumuthopuniye	*TBI
39.	Pulaye	*TBI
40.	Ashebaghiye	*TBI
41.	Anguchoniye	*TBI
42.	Yethsuye	*TBI
43.	Kimiva	*TBI

Sr. No	Local Name	Scientific Name
44.	Nikiniye	*TBI
45.	Shexuniye	*TBI
46.	Mishikhakhiniye	*TBI
47.	Atuye	*TBI
48.	Ghunakhaye	*TBI
49.	Asukhakhuniye	*TBI
50.	Shokheye	*TBI
51.	Shechuye	*TBI
52.	Vashuniye	*TBI
53.	Amaye	*TBI
54.	Kanilaye	*TBI
55.	Awumicheye	*TBI
56.	Nguvahi	*TBI
57.	Kolahiye	*TBI
58.	Kughuzupuye	*TBI
59.	Khonheye	*TBI
60.	Khobaye	*TBI
61.	Sumughoye	*TBI
62.	Yephoye	*TBI
63.	Nananiye	*TBI
64.	Nainiye	*TBI
65.	Ghasuye	*TBI
66.	Mughuniye	*TBI
67.	Mishimikhaye	*TBI
68.	Aqhuye	*TBI

Sr. No	Local Name	Scientific Name
69.	Muquye	*TBI
70.	Bobolisheniye	*TBI
71.	Chinhaghuye	*TBI
72.	Khatsuye	*TBI
73.	Pukuniye	*TBI
74.	Saghipaye	*TBI
75.	Kaumuthopuye	*TBI
76.	Ghutsuye	*TBI
77.	Khumiye (Apighi ilhovechekeu)	*TBI
78.	Kolahe	*TBI
79.	Yetsuye	*TBI
80.	Ashepaghiye	*TBI
81.	Kughuzhupuyu	*TBI
82.	Ayighe	*TBI
83.	Ayilo	*TBI
84.	Angozu	*TBI
85.	Angusamiye	*TBI
86.	Napa	*TBI
87.	Pulakhu	*TBI
88.	Shwathi	*TBI
89.	Alauthi	*TBI
90.	Thathi	*TBI
91.	Kichichoxuthi	*TBI
92.	Khu- ughuthi	*TBI
93.	Nakethi	*TBI

Sr. No	Local Name	Scientific Name
94.	Gheghputhi	*TBI
95.	Anuchubo	*TBI
96.	Akhethi	*TBI
97.	Zhokhu xhathi	*TBI
98.	Khubobo	*TBI

*** TBI- To Be Identified**

Appendix 5: Mammals of Ghukhuyi CCA

Sr. No	Order	Common Name	Scientific Name	Local Name	IUCN Red List Status
1.	**Insectivora**	House (Grey Musk) Shrew	*Suncus murinus* (Linnaeus, 1766)	Ajitshu	LR-lc
2.	**Chiroptera**	Greater Short-nosed fruit Bat	*Cynopterus sphinx* (Vahl, 1797)	Ashuqha	LR-lc
3.		Lesser Short-nosed fruit Bat	*Cynopterus brachiyotis* (Muller, 1838)	Ashuqha	LR-lc
4.	**Primates**	Rhesus Macaque	*Macaca mulatta* (Zimmermann, 1780)	Ashüki	LR-lc
5.		Slow Loris	*Nycticebus coucang* (Lacépède, 1800)	Kujokini shuki	LR-lc
6.	**Carnivora**	Wild Dog	*Cuon alpinus* (Pallas,1811)	Atine	EN
7.		Malayan Sun Bear	*Helarctos malayanus* (Raffles, 1821)	Ava	VU
8.		Asiatic Black Bear	*Ursus thibetanus* (G. Cuvier,1823)	Ava	VU
9.		Leopard Cat	*Prionailurus bengalensis* (Kerr, 1792)	Anghshü	LR-lc
10.		Jungle Cat	*Felis chaus* (Schreber, 1777)	Yeghili	LR-lc
11.		Fishing Cat	*Prionailurus viverrinus* (Bennett, 1833)	Anengü	EN
12.		Golden Cat	*Catopuma temminckii* (Vigors & Horsfield, 1827)	Anghshu Yaghiliu	NT
13.		Marbled Cat	*Pardofelis marmorata* (Martin, 1837)	Asunangu	NT
14.		Large Indian Civet	*Viverra zibetha* (Linnaeus, 1758)	Aqhü	LR-NT
15.		Himalayan Palm Civet	*Paguma larvata* (C.E.H. Smith, 1827)	Aküfü	LR-lc
16.		Eurasian Otter or Small- Clawed Otter	*Lutra lutra* (Linnaeus, 1758)	Achieghe	LR-NT

Sr. No	Order	Common Name	Scientific Name	Local Name	IUCN Red List Status
17.		Yellow-throated Martin	*Martes flavigula* (Boddaert, 1785)	Akhetsii	LR-lc
18.		Small Indian Mongoose	*Herpestes javanicus* (É. G. Saint-Hilaire, 1818)	Kighiu	LR-lc
19.		Ferret Badger	*Melogale spp* (Gray, 1831)		LR-lc
20.	**Aritodactyla**	Wild Boar	*Sus scrofa* (Linnaeus, 1758)	Amini	LR-lc
21.		Sambar	*Rusa unicolor* (Kerr, 1792)	Aqhü	VU
22.		Barking Deer	*Muntiacus muntjak* (Zimmermann,1780)	Ashe	LR-lc
23.		Red Serow	*Capricornis rubidus* (David, 1869)	Achüyi	LR-NT
24.		Goral	*Naemorhedus goral* (Hamilton Smith, 1827)		LR-NT
25.		Mithun	*Bos frontalis (Lambert, 1804)*	Avi ala	VU
26.	**Pholidota**	Chinese Pangolin	*Manis pentadactyla* (Linnaeus, 1758)	Ashiphi	CR
27.	**Rodentia**	Orange-bellied Himalayan Squirrel	*Dremomys lokriah* (Hodgson, 1836)	Sakhükili	LR-lc
28.		Himalayan Striped Squirrel	*Tamiops macclellandi* (Horsfield, 1840)	Azügha	LR-lc
29.		Hoary-bellied Squirrel	*Callosciurus pygerythrus* (I. Geoffroy Saint Hilaire, 1832)	Akili	LR-lc
30.		Red giant flying squirrel	*Petaurista petaurista* (Pallas, 1766)	Atulo	LR-lc
31.		Hoary Bamboo Rat	*Rhizomys pruinosus* (Blyth, 1851)	Achighi	LR-lc
32.		Field Mouse	*Mus booduga* (Gray, 1837)	Aghalo	LR-lc
33.		Asiatic Brush-tailed Porcupine	*Atherurus macrourus* (Linnaeus, 1758)	Kithimichequ	LR-lc

Sr. No	Order	Common Name	Scientific Name	Local Name	IUCN Red List Status
34.		Himalayan Crestless Porcupine	*Hystrix brachyura* (Linnaeus, 1758)	Acheqhü	LR-lc

Sources: Field data validated by experts and from the scientific literature; Molur et.al. (2002).

Legend

IUCN Red List categories:

CR-Critically endangered, EN-Endangered, VU-Vulnerable, LRnt-Lower Risk near threatened, LRlc-Lower Risk least concern, LR-cd-Lower Risk conservation dependent, DD-data deficient, NE-Not evaluated

Appendix 6: Birds of Ghukhuyi CCA

Sr. No.	Common Name	Scientific Name	Local Sema Name	IUCN Red List Status
1.	Hill Patridge	*Arborophila torqueola*	Akhi	LR-lc
2.	Rufous-throated Partridge	*Arborophila rufogularis*	-	LR-lc
3.	Mountain Bamboo Patridge	*Ambusicola fytchii*	Aili	LR-lc
4.	Red Junglefowl	*Gallus gallus*	Lolivü	LR-lc
5.	Kalij pheasant	*Lophura leucomelanos*	Aghi	LR-lc
6.	Speckled Piculet	*Picumnus innominatus*	Akhokho	LR-lc
7.	White-browed Piculet	*Sasia ochracea*	Achüshü	LR-lc
8.	Rufous woodpecker	*Dendrocopos hyperythrus*	Kasüghü	LR-lc
9.	Bay woodpecker	*Blythipicus pyrrhotis*	Kasüghü	LR-lc
10.	Grey-capped Pygmy Woodpecker	*Dendrocopos canicapillus*	Kasughu-also	LR-lc
11.	Great Barbet	*Megalaima virens*	Chengü	LR-lc
12.	Golden-throated Barbet	*Megalaima franklinii*	Echemü	LR-lc
13.	Blue-throated Barbet	*Megalaima asiatica*	Shakhü	LR-lc
14.	Coppersmith Barbet	*Megalaima haemacephala*	Sheqhü	LR-lc
15.	Common Hopooe	*Upupa epops*	Natugha	LR-lc
16.	Red-headed Trogon	*Harpactes erythrocephalus*	Kühüyü	LR-lc
17.	Indian Roller	*Coracias benghalensis affinis*	Awute	LR-lc
18.	Dollarbird	*Eurystomus orientalis*	Atsüü	LR-lc
19.	Hooded Pitta	*Pitta sordida*	Sokulu	LR-lc
20.	Silver Breasted Broadbill	*Serilophus lunatus*	Azochu-u	LR-lc
21.	Long Tailed Broadbill	*Psarisomus dalhousiae*	Atsu-u	LR-lc
22.	Asian Fairy Bluebird	*Irena puella*	-	LR-lc
23.	Golden Fronted Leafbird	*Chloropsis aurifrons*	Migheu	LR-lc
24.	Orange Bellied Leafbird	*Chloropsis hardwickii)*	Migheu	LR-lc

Sr. No.	Common Name	Scientific Name	Local Sema Name	IUCN Red List Status
25.	Brown Shrike	*Lanius cristatus*	Tughashokhe	LR-lc
26.	Burmese Shrike	*Lanius collurioides*	Tuqu-u	LR-lc
27.	Grey Backed Shrike	*Lanius tephronotus*	Tughashokhe	LR-lc
28.	Small Green Bee-eater	*Merops orientalis*	-	LR-lc
29.	Asian Koel	*Eudynamys scolopaceus*	Agha	LR-lc
30.	Common Kingfisher	*Alcedo atthis*	Alisii	LR-lc
31.	White-throated Kingfisher	*Halcyon smyrnensis*	-	LR-lc
32.	Stork Billed Kingfisher	*Pelargopsis capensis*	Chichighe	LR-lc
33.	Common Hawk Cuckoo	*Hierococcyx varius*	Pipilhü	LR-lc
34.	Large Hawk Cuckoo	*Hierococcyx sparverioides*	Ahhaqü	LR-lc
35.	Eurasian Cuckoo	*Cuculus canorus*	Akheü	LR-lc
36.	Plaintive Cuckoo	*Cacomantis merulinus*	Thochiu	LR-lc
37.	Drongo Cuckoo	*Surniculus lugubris*	Mililoba	LR-lc
38.	Greater Coucal	*Centropus sinensis*	Akhakhü	LR-lc
39.	Alexandrine Parakeet	*Psittacula eupatria*	Achoki	LR-lc
40.	Rose-ringed parakeet	*Psittacula krameri*	Achoki	LR-lc
41.	Slaty-headed parakeet	*Psittacula himalayana*	Achoki	LR-lc
42.	Red-breasted Parakeet	*Psittacula alexandri*	Achoki	LR-lc
43.	Collared Scops Owl	*Otus bakkamoena*	Akhokho	LR-lc
44.	Spot-bellied Eagle Owl	*Bubo nipalensis*	Akhokho	LR-lc
45.	Tawny Fish Owl	*Ketupa flavipes*	Akhokho	LR-lc
46.	Collared Owlet	*Glaucidium cuculoides*	Akhokho	LR-lc
47.	Asian Barred Owlet	*Glaucidium brodiei*	Akhokho	LR-lc
48.	Spotted Owlet	*Athene brama*	Akhokho	LR-lc
49.	Brown Hawk Owl	*Ninox scutulata*	Akhokho	LR-lc
50.	Himalayan Griffon Vulture	*Gyps himalayensis*	Aghu	NT
51.	White Rumped Vulture	*Gyps bengalensis*	Akumokuchu-u	CR

Sr. No.	Common Name	Scientific Name	Local Sema Name	IUCN Red List Status
52.	Hen Harrier	*Circus cyaneus*	Ayilu	LR-lc
53.	Pied Harrier	*Circus melanoleucos*	Ayilu	LR-lc
54.	Common Kestrel	*Falco tinnunculus*	Helhoshe	LR-lc
55.	Osprey	*Pandion haliaetus*	Aluqu	LR-lc
56.	Pallas Fish Eagle	*Haliaeetus leucoryphus*	Kuzuvaqu	LR-lc
57.	Black Eagle	*Ictinaetus malaiensis*	Aluqhuamutau	LR-lc
58.	Large-tailed nightjar	*Caprimulgus macrurus*	Kuduru	LR-lc
59.	Grey Nightjar	*Caprimulgus jotaka*	Khechou	LR-lc
60.	Eurasian Collared Dove	*Streptopelia decaocto*	Achui	LR-lc
61.	Barred Cuckoo Dove	*Macropygia unchall*	Aiso	LR-lc
62.	Oriental Turtle Dove	*Streptopelia orientalis*	Akheü	LR-lc
63.	Spotted Dove	*Streptopelia chinensis*	Mikhedü	LR-lc
64.	Pin-tailed Green Pigeon	*Treron apicauda*	-	LR-lc
65.	Emerald Dove	*Chalcophaps indica*	Ghaboghau	LR-lc
66.	Pompadour Green Pigeon	*Treron pompadora*	Apuzagudili	LR-lc
67.	Wedge-tailed Green Pigeon	*Treron sphenura*	Adüngü	LR-lc
68.	Mountain Imperial Pigeon	*Ducula badia*	Ashughu	LR-lc
69.	Green Imperial Pigeon	*Ducula aenea*	Ashughu	LR-lc
70.	Oriental Honey-Buzzard	*Pernisptilorhyncus*	Alhüghü aghlo	LR-lc
71.	Black Kite	*Milvus migrans*	-	LR-lc
72.	Crested Serpent Eagle	*Spilornis cheela*	Ahüqhü akijeü	LR-lc
73.	Shikra	*Accipiter badius*	-	LR-lc
74.	Black Eagle	*Ictinaetus malayensis*	Alhüguahütaü	LR-lc
75.	Indian Cormorant	*Phalacrocorax fuscicollis*	Kivü	LR-lc
76.	Little Egret	*Egretta garzetta*	Kilaü	LR-lc
77.	Intermediate Egret	*Mesophoyx intermedia*	Azughau-akimiyeu	LR-lc

Sr. No.	Common Name	Scientific Name	Local Sema Name	IUCN Red List Status
78.	Cattle Egret	*Bubulcus ibis*	-	LR-lc
79.	Indian Pond Heron	*Ardeola grayii*	-	LR-lc
80.	Long-tailed Shrike	*Lanius schach*	Atü-ü	LR-lc
81.	Common Green Magpie	*Cissa chinensis*	Yili	LR-lc
82.	Rufous Treepie	*Dendrocitta vagabunda*	-	LR-lc
83.	Grey Treepie	*Dendrocitta formosae*	Müdükhakhü	LR-lc
84.	Collared Treepie	*Dendrocitta frontalis*	Mudukhakhu	LR-lc
85.	Large Billed Crow	*Corvus macrorhynchos*	Abagha	LR-lc
86.	Large Cuckooshrike	*Coracina macei*	Kutiti	LR-lc
87.	Black Winged Cuckooshrike	*Coracina melaschistos*	Thochiu	LR-lc
88.	White Breasted Waterhen	*Amaurornis phoenicurus*	Azughau	LR-lc
89.	River Lapwing	*Vanellus duvaucelii*	Azughau	LR-lc
90.	Black-hooded Oriole	*Oriolus xanthornus*	Eao	LR-lc
91.	Moroon Oriole	*Oriolus traillii*	Eao	LR-lc
92.	Long-tailed Minivet	*Pericrocotus ethologus*	Ichemü	LR-lc
93.	Short-billed Minivet	*Pericrocotus brevirostris*	-	LR-lc
94.	Grey Chinned Minivet	*Pericrocotus solaris*	Tsulichepu-adu	LR-lc
95.	Black Drongo	*Dicrurus macrocercus*	Mililoba	LR-lc
96.	Ashy Drongo	*Dicrurus leucophaeus*	Akhakhü	LR-lc
97.	Bronzed Drongo	*Dicrurus aeneus*	Khaülahe	LR-lc
98.	Spangled drongo	*Dicrurus hottentottus*	Mililoqhu	LR-lc
99.	Lesser Racket-tailed Drongo	*Dicrurus remifer*	Milisaxe	LR-lc
100.	Greater Racket-tailed Drongo	*Dicrurus paradiseus*	-	LR-lc
101.	Eye-browed Thrush	*Turdus obscurus*	Tsütoti	LR-lc
102.	Dark-throated Thrush	*Turdus ruficollis*	-	LR-lc
103.	Verditer Flycatcher	*Eumyias thalassina*	Avetsüqü	LR-lc
104.	Large Niltava	*Niltava grandis*	Avetsüqü	LR-lc

Sr. No.	Common Name	Scientific Name	Local Sema Name	IUCN Red List Status
105.	Rufous-bellied Niltava	*Niltava sundara*	Kirala	LR-lc
106.	Pale-chinned Flycatcher	*Cyornis poliogenys*	Yoyopü	LR-lc
107.	Blue-throated Flycatcher	*cyornis ruberculoides*	-	LR-lc
108.	Grey-headed canary Flycatcher	*Culicicapa ceylonensis*	Tüghasoqha	LR-lc
109.	Pygmy Blue Flycatcher	*Cyornis hodgsoni*	-	LR-lc
110.	Bar winged flycatcher	*Hemipus picatus*	Alighau	LR-lc
111.	Yellow Bellied Fantail	*Chelidorhynx hypoxantha*	Atzukuxu-u	LR-lc
112.	White Throated Fantail	*Rhipidura albicollis*	Tsutsuba	LR-lc
113.	Black Naped Monarch	*Hypothymis azurea*	Aveghau	LR-lc
114.	Siberian Rubythroat	*Luscinia calliope*	Ijü	LR-lc
115.	White-capped Water Redstart	*Chaimarrornis leucocephalaus*	-	LR-lc
116.	Little Forktail	*Enicurus scolueri*	Abaya	LR-lc
117.	Black-backed Forktail	*Enicurus immaculatus*	Abaya	LR-lc
118.	Slaty-backed Forktail	*Enicurus schistaceus*	Abaya	LR-lc
119.	Spotted Forktail	*Enicurus maculatus*	Abaya	LR-lc
120.	Great Tit	*Parus major*	Tsükhekhe	LR-lc
121.	Green-backed Tit	*Parus monticolus*	Tsükhekhe	LR-lc
122.	Yellow-browed Tit	*Sylviparus modestus*	Awolre	LR-lc
123.	Black-Throated Tit	*Aegithalos concinnus*	Tughuliti	LR-lc
124.	Crested Finchbill	*Spizixos canifrons*	Kuruqheqhe	LR-lc
125.	Black-crested Bulbul	*Pycnonotus melanicterus*	Kiphikuru	LR-lc
126.	Red-Whiskered Bulbul	*Pycnonotus jocosus*	Müdüdungü	LR-lc
127.	Red-vented Bulbul	*Pycnonotus cafer*	Müdüdungu	LR-lc
128.	Flavescent bulbul	*Pycnonotus flavescens*	Thümü	LR-lc
129.	White-throated Bulbul	*Alophoixux flaveolus*	Kasughü	LR-lc
130.	Black Bulbul	*Hypsipetes leucocephalus*	Amiyi	LR-lc

Sr. No.	Common Name	Scientific Name	Local Sema Name	IUCN Red List Status
131.	Ashy Bulbul	*Hemixos flavala*	Topiko	LR-lc
132.	Mountain Bulbul	*Ixos mcclellandii*	-	LR-lc
133.	Slaty-bellied Tesia	*Tesia olivea*	-	LR-lc
134.	Thick-billed Warbler	*Acrocephalus aedon*	Logiü	LR-lc
135.	Mountain Tailorbird	*Orthotomus cuculatus*	Zürüti	LR-lc
136.	Common Tailorbird	*Orthotomus sutorius*	Zuruti	
137.	Dark-necked Tailorbird	*Acrocephalus aedon*	Avetsüqho	LR-lc
138.	Buff-barred Warbler	*Phylloscopus pulcher*	Zürüti	LR-lc
139.	Ashy-throated Warbler	*Phylloscopus maculipennis*	Zürüti	LR-lc
140.	Hume's Warbler	*Phylloscopus humei*	Zürüti	LR-lc
141.	Blyth's Leaf Warbler	*Phylloscopus reguloides*	Zürüti	LR-lc
142.	Golden-spectacled Warbler	*Seicercus burkii*	Zürüti	LR-lc
143.	Grey-hooded Warbler	*Seicercus xanthoschistos*	Zürüti	LR-lc
144.	Grey-cheeked Warbler	*Seicercus poliogenys*	Zürüti	LR-lc
145.	Broad-billed Warbler	*Tickellia hodgsoni*	Zürüti	LR-lc
146.	Rufous-faced Warbler	*Abroscopus albogularis*	Zürüti	LR-lc
147.	Black-faced Warbler	*Abroscopus schisticeps*	Zürüti	LR-lc
148.	White-crested Laughing Thrush	*Garrulax leucolophus*	Amu-ü	LR-lc
149.	Greater-necklaced Laughing Thrush	*Garrulax pectoralis*	Aloghe	LR-lc
150.	Rufous-necked Laughing Thrush	*Garrulax ruficollis*	Akhuya	LR-lc
151.	Yellow-throated Laughing thrush	*Dryonastes galbanus*	Tsutopu	LR-lc
152.	Striped Laughing thrush	*Trochalopteron virgatum*	Sukihi	LR-lc
153.	Chestnut-crowned Laughing Thrush	*Garrulax erythrocephalus*	Aioo	LR-lc
154.	Ashy Laughingthrush	*Garrulax cinereifrons*	Ali tsutopu	LR-lc

Sr. No.	Common Name	Scientific Name	Local Sema Name	IUCN Red List Status
155.	Blue capped Rock Thrush	*Monticola cinclorhynchus*	Kirla	LR-lc
156.	Chestnut bellied Rock Thrush	*Monticola rufiventris*	Kirla	LR-lc
157.	Scaly Thrush	*Zoothera dauma*	Tsutoti	LR-lc
158.	White Browed Piculet	*Sasia ochracea*	Ashushu	LR-lc
159.	Red-faced Liochicla	*Liocichla phoenicea*	Tsütopü	LR-lc
160.	Puff-throated Babbler	*Pellorneum ruficeps*	-	LR-lc
161.	Spot-breasted Scimitar Babbler	*Pomatorhinus erythrocnemis*	-	LR-lc
162.	White-browed Scimitar Babbler	*Pomatorhinus schisticeps*	Alau	LR-lc
163.	Streak-breated Scimitar Babbler	*Pomatorhinus ruficollis*	Alau	LR-lc
164.	Coral-billed Scimitar Babbler	*Pomatorhinus ferruginosus*	Ahoghe	LR-lc
165.	Rufous-capped Babbler	*Stachyris ruficeps*	-	LR-lc
166.	Abbots Babbler	*Malacocincla abbotti*	-	LR-lc
167.	Spotted Wren Babbler	*Elachura formosa*	-	LR-lc
168.	Naga Wren Babbler	*Spelaeornis chocolatinus*	Ajixoti	LR-lc
169.	Cachar Wren Babbler	*Sphenocichla roberti*	Ajixoti	LR-lc
170.	Siver-eared Mesia	*Leiothrix argentauris*	Achita	LR-lc
171.	White tailed Nuthatch	*Sitta himalayensis*	Sumugho	LR-lc
172.	Siberian Stonechat	*Saxicola maurus*	-	LR-lc
173.	Pied Bushchat	*Saxicola caprata*	-	LR-lc
174.	Grey Bushchat	*Saxicola ferreus*	-	LR-lc
175.	White-browed Shrike Babbler	*Pteruthius flaviscapis*	Azochu	LR-lc
176.	Rusty-fronted Barwing	*Actinodura egertoni*	Kuzomighe	LR-lc
177.	Golden-breasted Fulvetta	*Alcippe chrysotis*	-	LR-lc
178.	Yellow-throated Fulvetta	*Alcippe cinerea*	-	LR-lc
179.	White-browed Fulvetta	*Alcippe vinipectus*	-	LR-lc
180.	Blue winged Minla	*Minla cyanouroptera*	Aghauloji	LR-lc

Sr. No.	Common Name	Scientific Name	Local Sema Name	IUCN Red List Status
181.	Chestnut tailed Minla	*Minla strigula*	-	LR-lc
182.	Red tailed Minla	*Minla ignotincta*	-	LR-lc
183.	Grey Sibia	*Heterrophasia gracilis*	Aichiü	LR-lc
184.	Rufous backed Sibia	*Heterophasia annectens*	-	LR-lc
185.	Crimson Sunbird	*Aethopyga siparaja*	Kühu-ü	LR-lc
186.	Fire-tailed Sunbird	*Aethopyga ignicauda*	-	LR-lc
187.	Streaked Spiderhunter	*Arachnothera magna*	Ashushu-u	LR-lc
188.	Little Spiderhunter	*Arachnothera longirostra*	Ashushu-u	LR-lc
189.	Fire breasted Flowerpecker	*Dicaeum ignipectus*	Adaghau	LR-lc
190.	Scarlet breasted Flowerpecker	*Prionochilus thoracicus*	Adaghau	LR-lc
191.	House Sparrow	*Passer domesticus*	Tughashoqhe	LR-lc
192.	Eurasian Tree Sparrow	*Passer montanus*	Shokheti	LR-lc
193.	Forest Wagtail	*Dendronanthus indicus*	Aiti	LR-lc
194.	Grey Wagtail	Motacilla cinerea	-	LR-lc
195.	White browed wagtail	Motacilla maderaspatensis	-	LR-lc
196.	Olive backed Pipit	*Anthus hodgsoni*	Akiniyiti	LR-lc
197.	Munia species	*Lonchura sps*	Tsuquti	LR-lc
198.	Crested Bunting	*Melophus latami*	-	LR-lc
199.	Striated Prinia	*Prinia crinigera*	-	LR-lc
200.	Black throated Prinia	*Prinia atrogularis*	-	LR-lc
201.	Rufescent Prinia	*Prinia rufescens*	-	LR-lc
202.	Grey breasted Prinia	*Prinia hodgsonii*	-	LR-lc
203.	Oriental White Eye	*Zosterops palpebrosus*	Loliu	LR-lc
204.	Martin, Swifts and Swallows	-	Akhalu	LR-lc
205.	TBI		Wuchou Kipe	
206.	TBI		Kuüti	
207.	TBI		Aghu	

Sr. No.	Common Name	Scientific Name	Local Sema Name	IUCN Red List Status
208.	TBI		Shefu	
209.	TBI		Alisu	
210.	TBI		Shokulu	
211.	TBI		Liliti	
212.	TBI		Tsuliche	
213.	TBI		Amuu-u	
214.	TBI		Atsu-u	
215.	TBI		Abagha	
216.	TBI		Thochiu	
217.	TBI		Kashopapu	
218.	TBI		Yili	
219.	TBI		Khotsa KiniKupu	
220.	TBI		Tughukhu	
221.	TBI		Migheu	
222.	TBI		Tsughulipu	
223.	TBI		Acholi	

Note: TBI- To Be Identified

Source: Field data; verified by experts and from scientific literature

Legend

IUCN Red List categories: CR-Critically endangered, EN-Endangered, VU-Vulnerable, LRnt-Lower Risk near threatened, LRlc-Lower Risk least concern, LR-cd-Lower Risk conservation dependent, DD-data deficient, NE-Not evaluated

Appendix 7: Reptiles of Ghukhuyi CCA

Sr. No	Family	Common Name	Scientific Name	Local Name	IUCN Red Data List Status
Suborder- Iguania					
1.	Agamidae Gray, 1827	Jerdon's Forest lizard	*Calotes jerdoni*		LR-lc
2.		Moustached Forest Lizard	*Calotes mystaceus*		LR-lc
3.		Flat backed mountain Lizard	*Japalura planidorsata*		LR-lc
Sub order- Serpentes (Snakes)					
1.	Typhlopidae Merrem, 1820	Brahminy Worm Snake	*Ramphotyphlops brahminus* (Daudin, 1803)	Ajishokusa pighi	LR-lc
2.		Beaked Worm Snake	*Grypotyphlops acutus*	Kungumi pighi	LR-lc
3.	Boidae Gray, 1825	Common Sand Boa	*Gongylophis conicus* (Schneider, 1801)	Tümüpüghüi	LR-lc
4.		Red Sand Boa	*Eryx johnii* (Russell, 1801)		LR-lc
5.	Pythonidae Fitzinger, 1826	Burmese Python	*Python bivittatus* (Kuhl, 1820)	Tuwou pighi	VU
6.	Colubridae Oppel, 1811	Red necked Keelback	*Rhabdophis subminiatus* (Schlegel, 1837)	Atsütsa	LR-lc
7.		Short-nosed Vine Snake	*Ahaetulla prasina* (Boie,1827)	Tsütsüla pighi	LR-lc
8.		Green Rat Snake	*Ptyas nigromarginata* (Blyth,1854)	Azhŏchŏ	LR-lc
9.		Indo-Chinese Rat Snake	*Ptyas korros* (Schlegel, 1837)	Khapighi	LR-lc
10.		Ornate Flying Snake	*Chrysopelea ornate* (Shaw, 1802)		LR-lc
11.		Tawny Cat	*Boiga ochracea*		LR-lc

Sr. No	Family	Common Name	Scientific Name	Local Name	IUCN Red Data List Status
		Snake	(Gunther,1868)		
12.		Common Cat Snake	*Boiga trigonata* (Schneider, 1802)		LR-lc
13.		Eastern Cat Snake	*Boiga gokool* (Gray,1835)		LR-lc
14.		Light Barred Kukri	*Oligodon albocinctus* (Cantor,1839)	Atsütsŏ	LR-lc
15.		Common Trinket Snake	*Coelognathus helena* (Daudin, 1803)		LR-lc
16.		Green Trinket Snake	*Rhadinophis prasinus* (Blyth,1854)		LR-lc
17.		Eastern Trinket Snake	*Orthriophis cantoris* (Boulenger, 1894)		LR-lc
18.		Striped Trinket Snake	*Orthriphis taeniurus*	Ashe Pighi	LR-lc
19.		Mandarin Trinket Snake	*Euprepiophis mandarinus (Cantor, 1842)*		LR-lc
20.		Large Spotted Cat Snake	*Boiga multomaculata* (Boie, 1827)		LR-lc
21.		Painted Bronze Snake	*Dendrelaphis pictus* (Daudin, 1803)	Khau pighi	LR-lc
22.		Cantor's Black-headed Snake	*Sibynophis sagittarius* (Cantor, 1839)		LR-lc
23.	Elapidae Boie, 1827	Banded Krait	*Bungarus fasciatus* (Schneider, 1801)		LR-lc
24.		Monocoled Cobra	*Naja kaouthia* (Lesson, 1831)	Akümhŏ	LR-lc
25.		King Cobra	*Ophiophagus hannah* (Cantor, 1836)	Khinamuru pighi	VU
26.	Viperidae Boie, 1827	Pope's Pit Viper	*Trimeresurus popeorum* (Smith, 1937)	Azotsütsa	LR-lc
27.		TBI		Ayithu	
28.		TBI		Kunguliui pighi	

Sr. No	Family	Common Name	Scientific Name	Local Name	IUCN Red Data List Status
29.		TBI		Azu pighi	
30.		TBI		Apighi ala	

Source: Field data verified by experts and from scientific research books/journals

Note: TBI- To Be Identified

Legend

IUCN Red List categories:

CR-Critically endangered, EN-Endangered, VU-Vulnerable, LRnt-Lower Risk near threatened, LRlc-Lower Risk least concern, LR-cd-Lower Risk conservation dependent, DD-data deficient, NE-Not evaluated

Appendix 8: Amphibians of Ghukhuyi CCA

Sr. No	Family	Common Name	Scientific Name	IUCN Red Data List
1.	Bufonidae Gray, 1825	Common Indian Toad	*Duttaphrynus melanostictus* (Schneider, 1799)	LR-lc
2.	Dicroglossidae Anderson, 1871	Paddyfield or Cricket Frog	*Fejervarya spp* (Bolkay, 1915)	LR-lc
3.		Skittering Frog	*Euphylectis cyanophlyctis* (Schneider, 1799)	LR-lc
4.	Microhylidae Günther, 1858	Ornate Narrow-Mouthed Frog	*Microhyla ornata* (Duméril & Bibron, 1841)	LR-lc
5.	Rhacophoridae Hoffman, 1932		*Philautus spp* (Gistel, 1848)	LR-lc
6.		Indian Tree Frog	*Polypedates spp* (Tschudi, 1838)	LR-lc
7.		Twin-spotted Tree Frog	*Rhacophorus bipunctatus* (Ahl, 1927)	LR-lc
8.		Large Tree Frog	*Rhacophorus maximus* (Gunther, 1858)	LR-lc
9.	Hylidae Rafinesque, 1815	Indian Hylid Frog	*Hyla annectans* (Jerdon, 1870)	LR-lc

Source: Field data verified by experts and from scientific literature.

Legend

IUCN Red List categories:

CR-Critically endangered, EN-Endangered, VU-Vulnerable, LRnt-Lower Risk near threatened, LRlc-Lower Risk least concern, LR-cd-Lower Risk conservation dependent, DD-data deficient, NE-Not evaluated

Appendix 9: Butterflies and Moths of Ghukhuyi CCA

No.	Common Name	Scientific Name
	BUTTERFLIES	
	Family Hesperiidae, Subfamily Coeliadinae	
1	Brown Awl	*Badamia exclamationis*
2	Pale Green Awlet	*Burara gomata gomata*
3	White Banded Awlet	*Hasora taminatus bhavara*
	Family Hesperiidae, Subfamily Hesperiinae	
4	Forest Hopper	*Astictopterus jama olivascens*
5	Straight Swift	*Parnara cf.guttatus*
6	Tufted Ace	*Sebastonyma dolopia*
7	Dark Palm-Dart	*Telicota bambusae bambusae*
8	Spotted Demon	*Notocrypta feisthamelii alysos*
9	Indo-Chinese Common Banded Demon	*Notocrypta paralysos asawa*
10	Unidentified Swift species	*Polytrmis spp*
	Family Hesperiidae, Subfamily Pyrginae	
11	Fulvous Pied Flat	*Pseudocoladenia dan fabia*
12	Common Spotted Flat	*Celaenorrhinus leucocera*
	Family Lycaenidae, Subfamily Curetinae	
13	Bright Sunbeam	*Curetis bulis bulis*
14	Toothed Sunbeam	*Curetis dentata dentata*
	Family Lycaenidae, Subfamily Lycaeninae	
15	Golden Sapphire	*Heliophorus brahma brahma*
16	Green Sapphire	*Heliophorus moorei tytleri*
	Family Lycaenidae, Subfamily Polyommatinae	

No.	Common Name	Scientific Name
17	Pointed Ciliate Blue	*Anthene lycaenina lycambes*
18	Silver Forget-me-not	*Catochrysops panormus exiguus*
19	Elbowed Pierrot	*Caleta elna noliteia*
20	Common Hedge Blue	*Acytolepis puspa gisca*
21	Plain Hedge Blue	*Celastrina lavendularis limbata*
22	Dark Cerulean	*Jamides bochus bochus*
23	Pea Blue	*Lampides boeticus*
24	Zebra Blue	*Leptotes plinius plinius*
25	Common Lineblue	*Prosotas nora ardates*
26	Dark Grass Blue	*Zizeeria karsandra*
	Family Lycaenidae, Subfamily Poritiinae:	
27	Common Gem	*Poritia hewitsoni*
	Family Lycaenidae, Subfamily Theclinae:	
28	Plane	*Bindahara phocides phocides*
29	Common Tit	*Hypolycaena erylus himavantus*
30	Common Flash	*Rapala nissa nissoides*
31	Long-banded Silverline	*Spindasis lohita himalayanus*
32	Club Silverline	*Spindasis syama peguanus*
33	Common Acacia Blue	*Surendra quercetorum quercetorum*
	Family Nymphalidae, Subfamily Apaturinae:	
34	Courtesan	*Euripus nyctelius nyctelius*
35	Circe	*Hestinalis nama nama*
	Family Nymphalidae, Subfamily Biblidinae:	
36	Angled Castor	*Ariadne ariadne pallidior*
37	Common Castor	*Ariadne merione tapestrina*

No.	Common Name	Scientific Name
	Family Nymphalidae, Subfamily Charaxinae:	
38	Great Nawab	*Charaxes eudamippus eudamippus*
39	Common Nawab	*Charaxes athamas athamas*
40	Tawny Rajah	*Charaxes bernardus hierax*
41	Yellow Rajah	*Charaxes marmax marmax*
	Family Nymphalidae, Subfamily Cyrestinae:	
42	Map Butterfly	*Cyrestis thyodamas thyodamas*
	Family Nymphalidae, Subfamily Danainae:	
43	Plain Tiger	*Danaus chrysippus chrysippus*
44	Striped Tiger	*Danaus genutia genutia*
45	Glassy Tiger	*Parantica aglea melanoides*
46	Chocolate Tiger	*Parantica melaneus plataniston*
47	Chestnut Tiger	*Parantica sita sita*
48	Dark Blue Tiger	*Tirumala septentrionis septentrionis*
49	Long-branded Blue Crow	*Euploea algea deione*
50	King Crow	*Euploea klugii klugii*
51	Striped Blue Crow	*Euploea mulciber mulciber*
	Family Nymphalidae, Subfamily Heliconiinae:	
52	Yellow Coster	*Acraea issoria issoria*
53	Indian Fritillary	*Argynnis hyperbius hyperbius*
54	Red Lacewing	*Cethosia biblis tisamena*
55	Leopard Lacewing	*Cethosia cyane cyane*
56	Large Yeoman	*Cirrochroa aoris aoris*
57	Rustic	*Cupha erymanthis*
58	Common Leopard	*Phalanta phalantha phalantha*

No.	Common Name	Scientific Name
59	Vagrant	*Vagrans egista sinha*
60	Cruiser	*Vindula erota erota*
	Family Nymphalidae, Subfamily Limenitidinae:	
61	Common Sergeant	*Athyma perius perius*
62	Orange dash Sergeant	*Athyma cama cama*
63	Staff Sergeant	*Athyma selenophora selenophora*
64	Common Baron	*Euthalia aconthea garuda*
65	Gaudy Baron	*Euthalia lubentina lubentina*
66	Powdered Baron	*Euthalia monina kesava*
67	Commander	*Moduza procris procris*
68	Dark Archduke	*Lexias dirtea khasiana*
69	Common Sailer	*Neptis hylas varmona*
70	Common Glider	*Neptis sappho astola*
71	Yellow Sailer	*Neptis ananta ochracea*
72	Pallas's Sailer	*Neptis sappho astola*
73	Common Earl	*Tanaecia julii appiades*
74	Commander	*Moduza procris procris*
	Family Nymphalidae, Subfamily Nymphalinae:	
75	Orange Oakleaf	*Kallima inachus inachus*
76	Autumn Leaf	*Doleschallia bisaltide indica*
77	Great Eggfly	*Hypolimnas bolina jacintha*
78	Peacock Pansy	*Junonia almana almana*
79	Chocolate Pansy	*Junonia iphita iphita*
80	Yellow Pansy	*Junonia hierta hierta*
81	Lemon Pansy	*Junonia lemonias lemonias*

No.	Common Name	Scientific Name
82	Blue Pansy	*Junonia orithya ocyale*
83	Indian Blue Admiral	*Kaniska canace canace*
84	Indian Red Admiral	*Vanessa indica indica*
85	Common Jester	*Symbrenthia lilaea khasiana*
86	Painted lady	*Vanessa cardui cardui*
	Family Nymphalidae, Subfamily Pseudergolinae:	
87	Tabby	*Pseudergolis wedah wedah*
88	Popinjay	*Stibochiona nicea nicea*
89	Wizard	*Rhinopalpa polynice birmana*
	Family Nymphalidae, Subfamily Satyrinae:	
90	Common Palmfly	*Elymnias hypermnestra undularis*
91	Spotted Palmfly	*Elymnias malelas malelas*
92	Dusky Diadem	*Ethope himachala*
93	Common Red Forester	*Lethe mekara zuchara*
94	Common Evening Brown	*Melanitis leda leda*
95	Dark Evening Brown	*Melanitis phedima bela*
96	Common Treebrown	*Lethe rohria rohria*
97	White line Bushbrown	*Heteropsis malsara*
98	Lilacine Bushbrown	*Mycalesis francisca sanatana*
99	Lepcha Bushbrown	*Mycalesis lepcha kohimensis*
100	Tiger Brown	*Orinoma damaris damaris*
101	Common Five-ring	*Ypthima baldus baldus*
102	Himalayan Five-ring	*Ypthima sakra sakra*
	Family Papilionidae, Subfamily Papilioninae:	
103	Green Dragontail	*Lamproptera meges indistincta*

No.	Common Name	Scientific Name
104	Tailed Jay	*Graphium agamemnon agamemnon*
105	Common Bluebottle	*Graphium sarpedon sarpedon*
106	Lime Butterfly	*Papilio demoleus demoleus*
107	Spangle	*Papilio protenor euprotenor*
108	Lesser Zebra	*Graphium macareus indicus*
109	Five-bar Swordtail	*Graphium antiphates pompilius*
110	Common Batwing	*Atrophaneura varuna astorion*
111	Common Windmill	*Byasa polyeuctes*
112	Common Rose	*Pachliopta aristolochiae aristolochiae*
113	Common Peacock	*Papilio bianor*
114	Paris Peacock	*Papilio paris paris*
115	Common Mime	*Papilio clytia clytia*
116	Great Blue Mime	*Papilio paradoxa telearchus*
117	Red Helen	*Papilio helenus helenus*
118	Yellow Helen	*Papilio nephelus chaon*
119	Great Mormon	*Papilio memnon agenor*
120	Common Mormon	*Papilio polytes romulus*
121	Common Birdwing	*Troides helena cerberus*
122	Bhutan Glory	*Bhutanitis lidderdalii,*
	Family Pieridae, Subfamily Coliadinae:	
123	Common Emigrant	*Catopsilia pomona pomona*
124	Three-spot Grass Yellow	*Eurema blanda silhetana*
125	Small Grass Yellow	*Eurema brigitta rubella*
126	Common Grass yellow	*Eurema hecabe hecabe*
127	Spotless Grass Yellow	*Eurema laeta sikkima*

No.	Common Name	Scientific Name
	Family Pieridae, Subfamily Pierinae:	
128	Common Albatross	*Appias albina darada*
129	Chocolate Albatross	*Appias lyncida eleonora*
130	Spot Puffin	*Appias lalage lalage*
131	Common Gull	*Cepora nerissa nerissa*
132	Red-spot Jezebel	*Delias descombesi descombesi*
133	Hill Jezebel	*Delias belladonna lugens*
134	Great Orange-tip	*Hebomoia glaucippe glaucippe*
135	Yellow Orange-tip	*Ixias pyrene familiaris*
136	Large Cabbage White	*Pieris brassicae nepalensis*
137	Cabbage White	*Pieris canidia indica*
138	Psyche	*Leptosia nina nina*
139	Pale Wanderer	*Pareronia avatar*
140	Spotted Sawtooth	*Prioneris thestylis*
	Family Riodinidae, Subfamily Nemeobiinae:	
141	Dark Judy	*Abisara fylla*
142	Punchinello	*Zemeros flegyas flegyas*
	MOTHS	
No.	**Common Name**	**Scientific Name**
1	Atlas Moth	*Attacus atlas*
2	Wild Eri Silk Moth	*Sania canningi*
3	Western Chinese Moon Moth	*Actias parasinensis*
4	Golden Emperor Moth	*Loepa spp.*
5	Large Pink & Green Moth	*Callambulyx rubicosa*
6	False Tiger Moth	*Dysphania militiaris*

No.	Common Name	Scientific Name
7	Giant Uraniid Moth	*Lyssa zampa*
8	Spotted Swallowtail Moth	*Micronia aculeate*
9	Crimson speckled Moth	*Utethesia lotrix*
10	Blue Neochera	*Neochera marmorea*
11	Goat Sucker Owl Moth	*Erebus caprimulgus*
12	Green coat Slug Moth	*Parasa darma*
13	Veined Brown Slug Moth	*Scopelodes venosa*

Source: Field data verified by experts and from scientific literature.

Appendix 10: Fish of Ghukhuyi CCA

Sr. No	Scientific Name	IUCN Red Data List Status
1.	*Semiplotus semiplotus* (Bleeker,1859)	LR-lc
2.	*Bangana dero* (Hamilton,1822)	LR-lc
3.	*Neolissochilus hexagonolepis* (McClelland, 1839)	NT
4.	*Puntius ticto ticto* (Hamilton,1822)	LR-lc
5.	*Poropuntius burtoni* (Mukerji,1933)	LR-lc
6.	*Tor putitora* (Hamilton,1822)	EN
7.	*Tor tor* (Hamilton,1822)	NT
8.	*Barilius barila* (Hamilton,1822)	LR-lc
9.	*Devario acuticephala* (Hora, 1921)	VU
10.	*Devario naganensis* (Chaudhuri,1912)	VU
11.	*Raiamas guttatus* (Day,1870)	LR-lc
12.	*Schizothorax richardsonii* (Gray, 1832)	VU
13.	*Garra kempi* (Hora, 1921)	LR-lc
14.	*Garra lissorhyncus* (McClelland, 1838)	LR-lc
15.	*Garra naganensis* (Hora, 1921)	LR-lc
16.	*Garra nasuta* (McClelland, 1838)	LR-lc
17.	*Schistura manipurensis* (Chaudhuri, 1912)	NT
18.	*Schistura nagaensis* (Menon, 1987)	VU
19.	*Schistura prashadi* (Hora, 1921)	VU
20.	*Schistura sikmaensis* (Hora, 1921)	LR-lc
21.	*Lepidocephalus guntea* (Hamilton, 1822)	LR-lc
22.	*Mystus bleekeri* (Day, 1877)	LR-lc
23.	*Amblyceps mangois* (Hamilton, 1822)	LR-lc
24.	*Glyptothorax sinise manipurensis* (Blyth,1860)	LR-lc

Sr. No	Scientific Name	IUCN Red Data List Status
25.	*Glyptothorax spp*(Blyth,1860)	LR-lc
26.	*Channa orientalis* (Bloch & J. G. Schneider, 1801)	LR-lc
27.	*Mastacembelus armatus* (Lacepède, 1800)	LR-lc
	Local names	
28.	*Zhumi*	TBI
29.	*Anipu*	TBI
30.	*Angusho*	TBI
31.	*Akhalu*	TBI
32.	*Ashuhakha*	TBI
33.	*Anishe*	TBI
34.	*Akhano*	TBI
35.	*Nguva*	TBI
36.	*Yavi*	TBI
37.	*Azhokha*	TBI
38.	*Aghungu*	TBI
39.	*Ngulitu*	TBI
40.	*Aghuha*	TBI
41.	*Shisa*	TBI
42.	*Akhaki*	TBI
43.	*Khamula*	TBI
44.	*Apokha*	TBI
45.	*Muzha*	TBI
46.	*Kida*	TBI
47.	*Aghukha*	TBI
48.	*Kighinipu*	TBI

Sr. No	Scientific Name	IUCN Red Data List Status
49.	*Lutsa*	TBI
50.	*Abo yavi*	TBI
51.	*Angu chighikha*	TBI
52.	*Nguzu*	TBI
53.	*Atruqo*	TBI
54.	*Ajikhu*	TBI
55.	*Chokibo*	TBI
56.	*Amasa*	TBI
57.	*Achuwa*	TBI

Source: Kosygin & Vishwanath, 1998

Note: TBI- To Be Identifed

Legend

IUCN Red List categories:

CR-Critically endangered, EN-Endangered, VU-Vulnerable, LRnt-Lower Risk near threatened, LRlc-Lower Risk least concern, LR-cd-Lower Risk conservation dependent, DD-data deficient, NE-Not evaluated

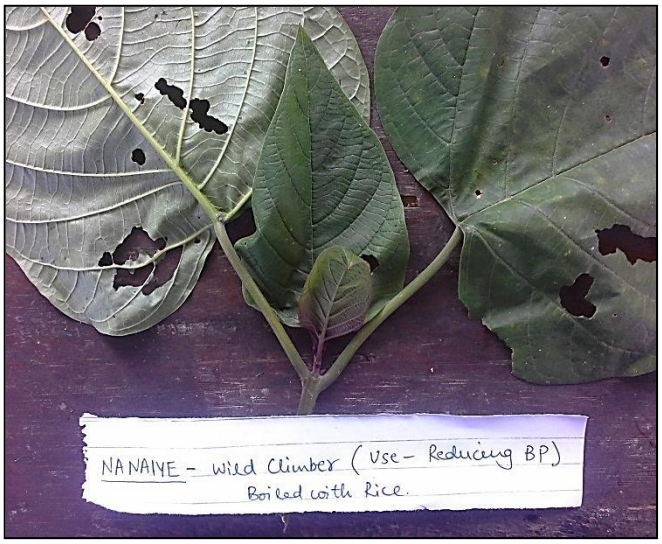
Appendix 11: Additional Photos of the biodiversity of the village

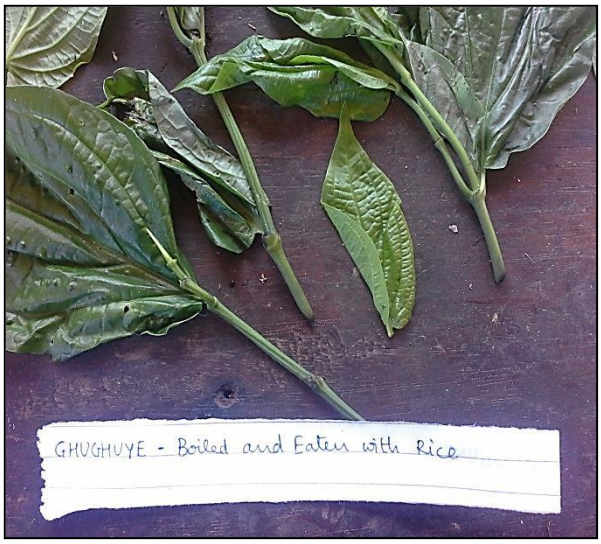
Image 26: Documentation of Biodiversity in Ghukhuyi CCA

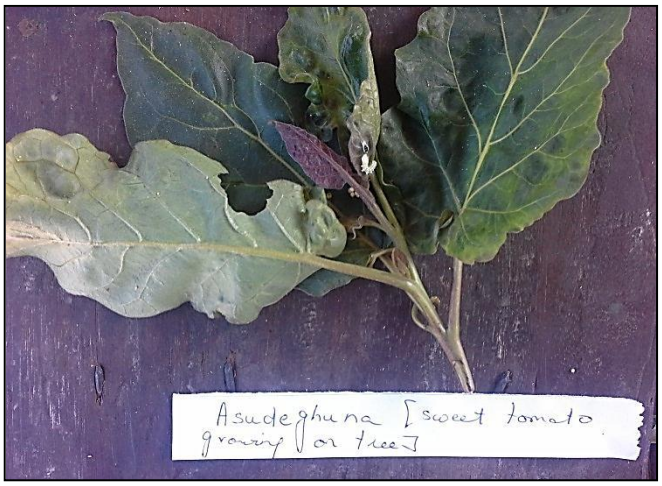
Image 27: Documentation of Traditional Practices

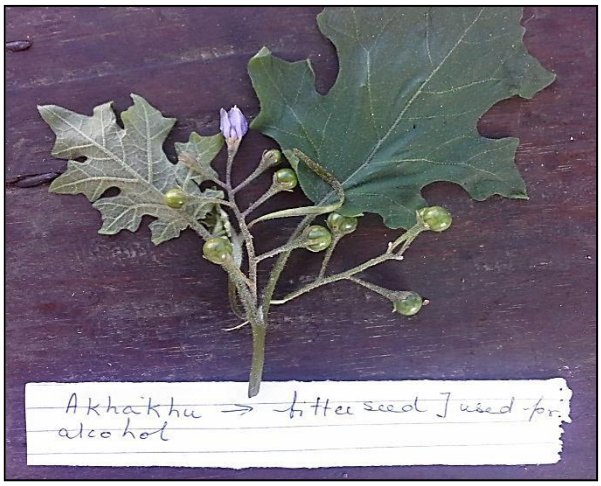
Image 28: River Tizü flowing on the boundary of Ghukhuyi CCA

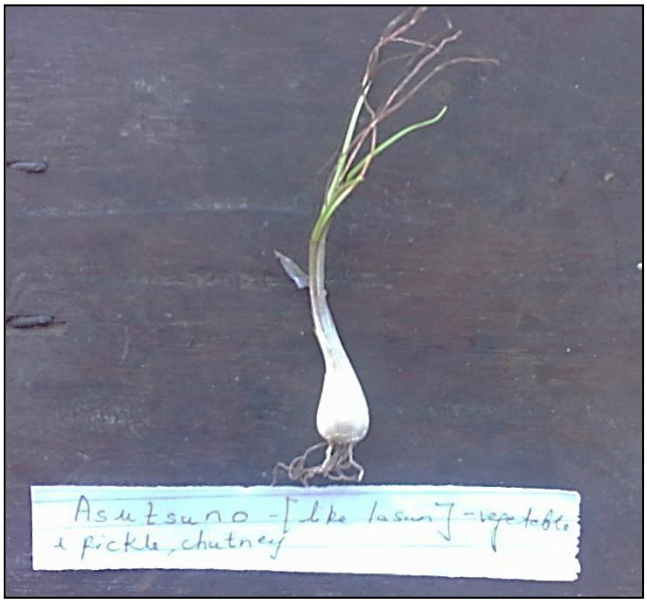
Wild Edible Plants and Crops



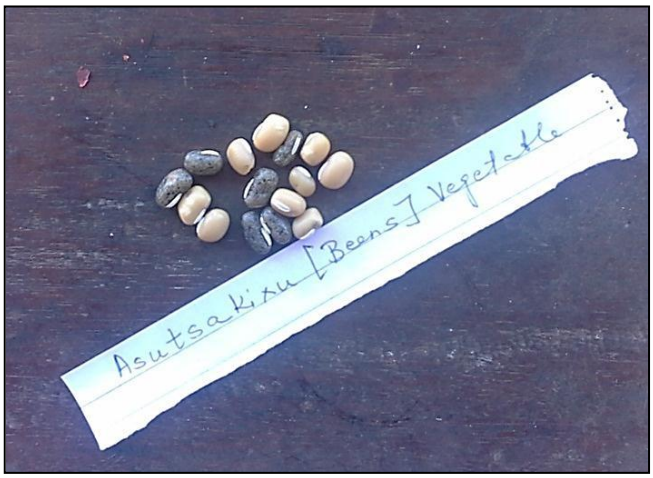


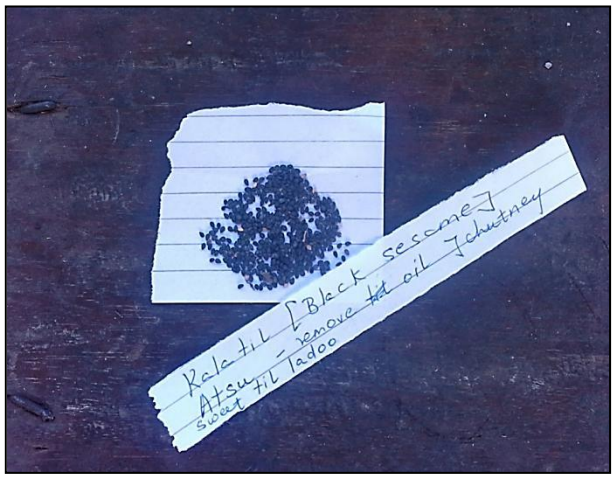


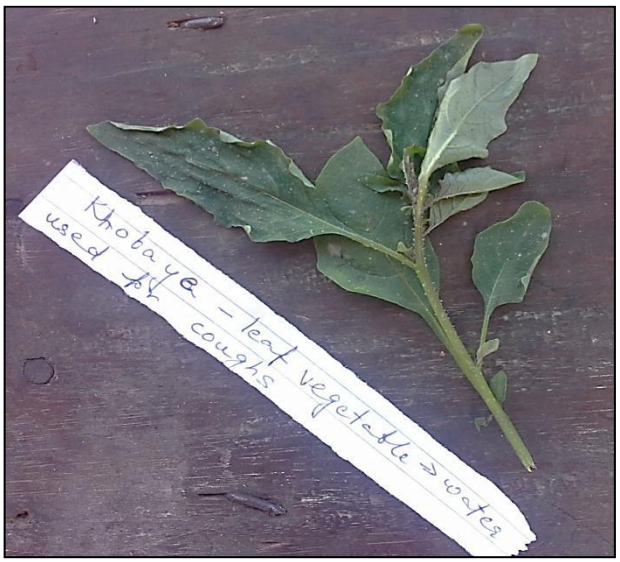



Asutsuno - [like lasuni] - vegetable
& pickle, chutney


Kadu patta [Ahamguniye] - Pumpk

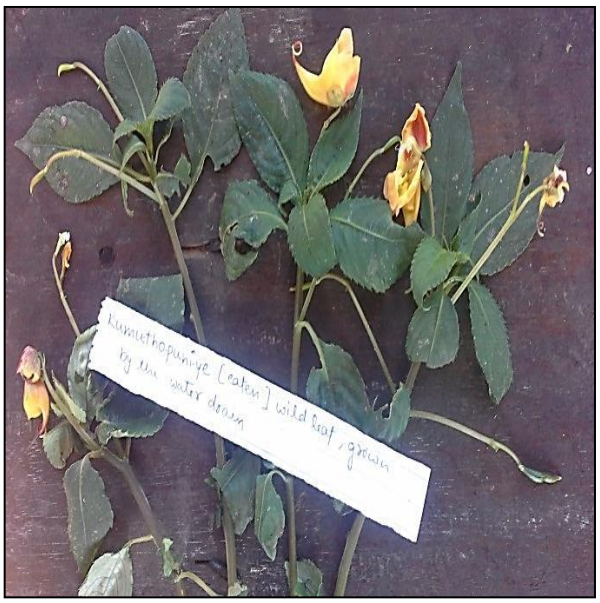

Asutsakiku [Beans] Vegetable

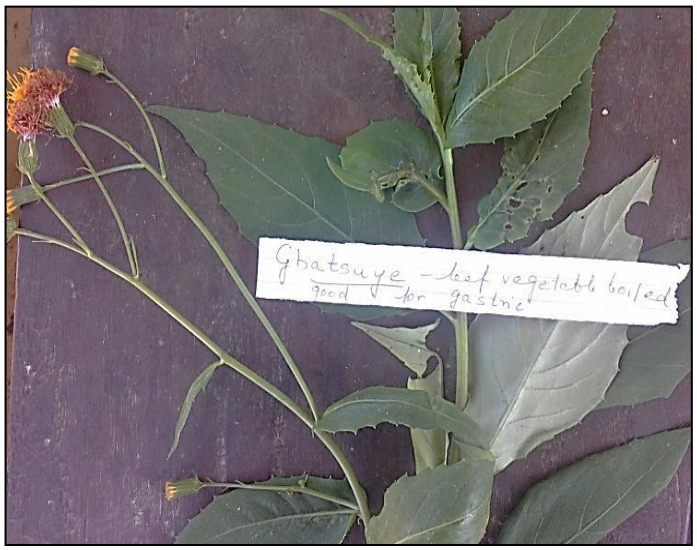

Kala til [Black sesame]
Atsuy - remove the oil
Sweet til ladoo
chutney


Khobaye - leaf vegetable
used for coughs

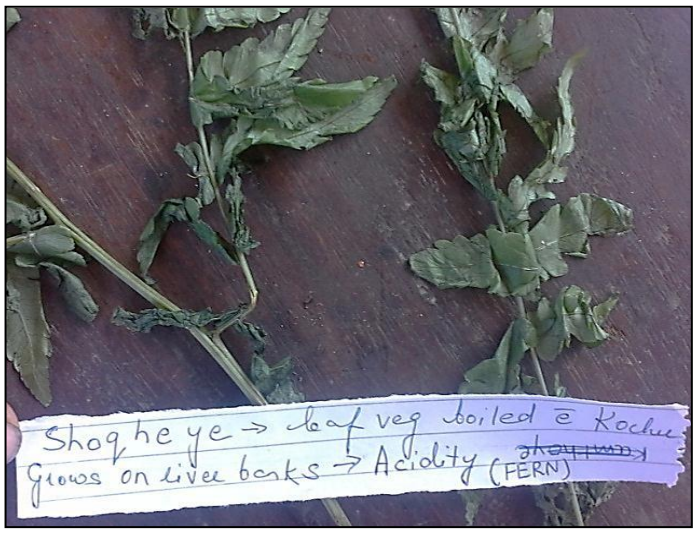

Akhushi - vegetable

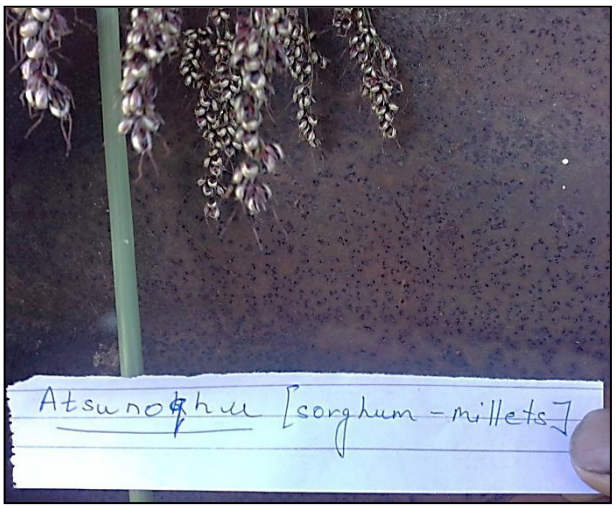

Nahuaye - leaf vegetable & Seeds
in chutney


Kumuthopuniye [eaten] wild leaf, grown
by the water stream


Ghatsuye - leaf vegetable boiled
good for gastric

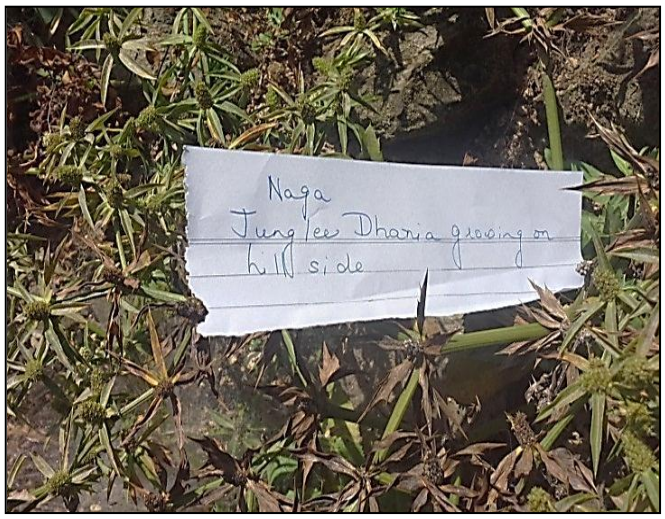

Khuuthi → Chutney or boiled
[Seed pods] raw [legume] ripe

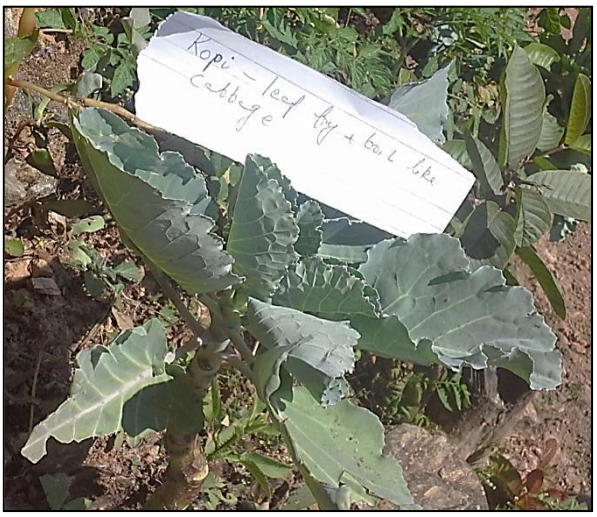

Shoghe ye → leaf veg boiled ē Kachu
Grows on river banks → Acidity (FERN)


Atsunokhuu [sorghum - millets]


Naga dal Aikhuu - boiled in leaves
High in vitamins (eg banana)


Konathe [A type of bean] → cooked
or raw → like a dal or chutney


Naga
Jungle Dharia growing on
hill side


Kopi – leaf fry + boil like
cabbage


Ahagu [Ampkin]


Akhu – Sauteed fry or

A glimpse of the biodiversity recorded from Ghukhuyi CCA- Mammals

Image 29: Himalayan Blackbear (Left) and Hoary bellied squirrel (Right)

Image 30: Asiatic bush tailed porcupine (Left) and Yellow throated marten (Right)

Image 31: Serow (Left) and Barking deer (Right)

A glimpse of the biodiversity recorded from Ghukhuyi CCA-Birdlife

Image 32: Mountain Bulbul (Left) and Crested Finchbill (Right)

Image 33: Migrating Black Bulbuls (Left) and Yellow bellied fantail (Right)

Image 34: Great Barbet 'Chengu' (Left) and Blue throated Barbet 'Sheqhu' (Right)

Image 35: Wedge tailed pigeon and Spotted Forktail (Juvenile)

Image 36: Streaked woodpecker (Left) and Grey Treepie (Right)

Image 37: Kestrel (Left) and Rufous Sibia (Right)

A glimpse of the biodiversity recorded from Ghukhuyi CCA- Amphibians and Reptiles

Image 38: ***Rhachophorus bipunctatus*** **and** ***Polypedatus sps***

Image 39: Moustached Forest Lizard (*Calotes mystaceus*) and Green Fan throated Lizard (*Ptyctolaemus gularis)*

Image 40: Indian Hylid Frog (*Hyla annectans*) and Large Tree Frog (*Rhachophorus maximus*)

A glimpse of the biodiversity recorded from Ghukhuyi CCA- Butterflies


Image 41: Spotted Sawtooth (Left) and Red Lacewing (Right)


Image 42: Five-bar Swordtail, Bluebottle & Chocolate Albatross (Left) and Paris Peacock (Right)


Image 43: Yeoman deriving nutrients from dead crabs (Left) and Pallas' Sailer feeding on Wild Dog Scat (right)

A glimpse of the biodiversity recorded from Ghukhuyi - Other Invertebrates

Image 44: Un-identified Scorpion (Left) and Nephila Spider spp (Right)

Image 45: Earthworm (Left) and Damselfly- Stream Glory (Right)

Image 46: Local fish (Left) and Crab (Right)