Chapter 3

Study site

Lower Subansiri district is located in the mid-west part of Arunachal Pradesh, bounded by West Siang district in the east, Upper Subansiri district in the north, Lakhimpur district of Assam in the south and in the west by Kurung Kumey and Papum Pare districts (Figure 3.1). The name of this district is derived from the Subansiri River, a tributary of mighty Brahmaputra that flows through Raga circle of this district. It lies in the 93°20 to 94°15 E longitude and 27°25 to 28°05 N latitude covering an area of 10,135 km². The topography of the district is mostly mountainous terrain, where the hill ranges varies approximately from 1000 to 1600 meters above sea level. Kamala is the major river of this district which originates from snow ranges of China (Tibet), flows south–east and meets the Subansiri River at Raga Circle which ultimately joins Brahmaputra in the plains of Assam. Some other rivers and rivulets flowing through the district are Khru, Panior, Kime, Panya, Selu, Pugo, Persen, Rein Sipu, Pange, Kiile etc.

Ziro is the districts headquarter of Lower Subansiri district which is located at about 1560 m above sea level. Ziro or the Apatani valley, as it is commonly referred to, is situated in the heart of the district and covers an area of 32 sq. km approx. The plateau lies between the valleys of Kamla and Khru on the north and Panior on the south. The plains of Apatani valley is drained by a small river named Kele, which flows to the south for about 40 kms and meets the river Panior, near Yazali (Subansiri district gazetteer). The study has been carried out in and around the villages of Apatani plateau. Five villages viz. Hari, Dutta, Mudang Tage, Bamin Michi and Hija were selected for study. A brief overview of these villages are given in Table 3.1.

Climate

The climate of the district is greatly influenced by the nature of its terrains varying with the natural divisions and elevations. The valley enjoys a temperate climate. The climate here can be divided into four distinct zones, 1) cold weather season from
December to February 2) pre-monsoon season thunderstorms from March to May 3) south – west monsoon from June to middle of October and 4) period of retreating monsoon from second half of October to November. Within the district, the climate of low lying areas or the foothills is comparatively moderate in comparison to high belt areas. Average annual rainfall of the district headquarter, Ziro recorded as 934.88 cms during 2000. Relative humidity is always high throughout the year except in the winter months being slightly less humid (Table 3.2). In the cold season, the sky is obscured on many mornings due to lifted fog which clears with the advance of the day generally, moderately clouded in the period of March to May, heavily clouded to overcast in the monsoon season and clear or slightly clouded during the post monsoon season. Winds are generally light strong katabolic winds down the valleys are experienced as local effect produced by the nature of terrain. The Lower Subansiri district is divided into two climatic zones: semi–temperate and sub–tropical zones. Winters are very cold and chilling, while summers are pleasant. Annual rainfall in the south is heavier than that in the northern areas of the district. Variability of rainfall for the monsoon and the year, as a whole, are relatively small.

Vegetation

In Arunachal Pradesh, all the tribes, except Khamptis and Apatanis practice shifting cultivation. The Khamptis pratice wet rice agriculture and Apatanis in addition to wet rice also cultivate fish on the same plot of land. The Apatanis do not practice shifting agriculture so the mountains surrounding the valley have not been deprived of the beautiful forests as compared to other areas where jhuming are prevalent. The forests of Subansiri district has been broadly classified into five main types: i) Tropical Evergreen forests, ii) Sub-Tropical forests, iii) Sub-tropical Grasslands, iv) Temperate Forets and v) Sub-Alpine and Alpine Vegetation (Subansiri district Gazetteer).

The main species found in these temperate forests are Abies densa, Quercus spp., Michilus vilosa, Schima wallichii, Cinnamomum cecidephne, Prunus cornata, Taxus baccata, Cephalotaxus, etc in the top storey under which Acer spp., Rhododendron, Piers ovalifolia, Gaultheria, Rubus niveus, Prinsepia utilis, Indigofera spp., ferns, orchids,
medicinal plants etc are present. Besides, the above mentioned broadleaved species like the conifers, Abies densa, Pinus wallichiana etc are also available.

The forest cover of the Lower Subansiri district of Arunachal Pradesh comprises about 14.2 million ha, which contributes about 77.1% of the State’s total forest cover. Based on the nature occurrence and the habitats, the forest cover of the Apatani Valley which is taken as representative of the study site, is being classified here as under:-

**Natural forest**

The type of forest found under the region is described as an evergreen forest comprising both temperate and sub–alpine coniferous forests. Such forest occurs between 2800 m to 4000 m altitudes beyond temperate broadleaved evergreen forests. The lower limits of such forest are dominated by mixed coniferous types, the species composition of which are given as Abies spp., Pinus spp., Taxus spp., etc. whereas the upper limit is dominated by species like Abies, Juniperus, Larix, Picea, Tsuga, Taxus, etc.

The subtropical pine forest occurs between altitudes of 1000 m to 1800 m in the subtropical regions of the area. Mostly represented by the members of Pinaceae like Pinus kesiya, Pinus roxburghii, Pinus wallichiana, Pinus merkusii mixed with other members such as Alnus spp., Elaeocarpus spp., Desmodium spp., Berberis spp., Cyathea spp., etc., shrubby and herbaceous species like Desmodium spp., Indigofera spp., Rubus spp. are abundant. Because of recurrent fires during winter season, epiphytes and undergrowth are less in these forests.

Forest cover with wild species yet occurring in the fringes of human settlement constitutes species of woody trees with medium height (5 to 10 m tall) such as Ficus sp., Tectona grandis, Shorea robusta, and some woody lianas and soft stem climbers with scarcely distributed population, very thin in density and some members of Asteraceae namely Ageratum conizoides, Eupatorium odoratum, grasses and ferns.

Such forest patches are the major site for grazing of cattle and other human activities suffering the anthropogenic disturbances at the highest gradient.
Man made ecosystems

Pine Forest

The pine forest occur in the private or clan or community forest of the Apatanis and are found growing mostly by the foothills of the valley adjacent to the settled farmland of the community called as ‘Sartii’, the pine groves. This grove is used for the purpose of different aspects like timber, planks, poles, fuel wood and other domestic perspectives. Pine needles are greatly cared and tamed by the indigenous people. The frequently grown species of pine are Pinus wallichinana, P. longifolia and P. khasiana some other conifers like, Cryptomeria japonica, Cupressus spp. etc.

Bamboo forest

Bamboo is cultivated by the indigenous communities (the Apatanis) which call it as ‘Biije’. The species which is cultivated in the private or individual land area is Phyllostachys bamboosoides, which is a monopodial culm with an average height of 9 to 22 m tall and the culm diameter of 10 to 15 cm. P. bamboosoides is known to be a native of central and southern China. The bamboo plantation is operated under village forest management committee (VFMC) scheme in the non-forested areas.

Wild life

The Lower Subansiri district is also rich in wild fauna such as tigers, panthers, leopard, cats, bear, boars, antelopes, monkeys, barking deer and squirrels etc. Among carnivores, the tiger (Panthera tigris Linnaeus) is rare while the leopard (Panthera pardus Linnaeus) is generally found. The Large Indian Civet (Viverra zibetha Linnaeus), the Spotted Linsang (Prionodon pardicolor Hodgson), the Common Palm Civet (Paradoxurus hermaphroditus Pallas) and the Masked Palm Civet (Paguma larvata Hamilton-Smith) are common in the forests. Another commonly found animal is the jackal (Canis aureus Linnaeus), often seen in the low lying areas. The Indian Elephant (Elephas maximus Linnaeus) is common in the areas covered with bamboos. Different kinds of deer like Sambaar (Cervus unicolor Kerr), Barking deer (Muntiacus muntjak Zimmermann) etc are also found in the district. In the grassy jungles of the region, the Indian Bison (Bos gaurus Smith), Indian Wild Boar (Sus scrofa Linnaeus) etc are
commonly spotted in the region. Primates such as Assamese Macaque (Macaca assamesnsis McClelland), Capped Langur (Presbytis pileatus Blyth) are also common and seen in troupes causing heavy damage to crops. In addition a large variety of insectivores, rodents, birds and fishes are also available in the area (Subansiri district gazetteer).

**Geology and soil**

The Apatani valley falls under the lesser Himalayan regions consisting of metamorphic rocks, the river Kele that flows through the mouth from the foothills towards low lying beds piles about a thick layer of unconsolidated sediments due gradual erosion of the bordering hillocks. The penultimate beds of the river are deposited gravel mixed with sand, grit, clay and peat in an almost horizontal distribution along the sides of settled farmlands. The base valley is made of gneiss and schist. Concordant bands of banded or augen–biotite gneisses have been seen to be associated with the schist. Extensive development of gneissic and granitic rocks within this formation is seen on the plateau. Of late the area has come under the purview of geologist as the area has shown occurrences of many important minerals and ores. Minerals such as arsenopyrite has been reported from the area of confluence of Kele and Ranga rivers, crystals of white beryl from near Yachuli which is about 69 kms from Kimin–Ziro road, sulphide, cobalt, nickel and clay from Ranga valley (Subansiri district gazetteer). In addition, occurrences of copper, magnetite, lead zinc, graphite, limestone, mica, phosphorite, pyrite, pyrrhotite etc are also reported from the district.

Soils vary from loamy to clayey with a thick layer of humus at the top. The valley soil contains some grey clays, sands and thin peat beds belonging to the Pleistocene Age. Soil acidity ranges from medium to high. Moisture content and soil organic carbon have been recorded to be very high. People practice organic farming here hence the addition of organic wastes, leading to increased carbon content in soil.

**People**
Apatanis belong to the Tibeto–Mongoloid stock and confined to the Apatani group of villages in Ziro or the Apatani valley. In the absence of any archaeological proof on the history of Apatanis, it has been quite difficult to trace the migration of this tribe and determining the time when they settled in the Ziro valley. According to Furer–Haimendorf, the local traditions speak of migration from north but it refers to the last mass migration by Apatanis, before that they might have changed their course more than once. It is believed that the ancestors of Apatanis came from a place to the north or northeast which is situated near two rivers known as Supupad–Pudpumi (Subansiri district gazetteer). Though the place could not be confirmed but it is believed that it refers to the two tributaries of Subansiri. However, it has been confirmed that Apatanis, during their course of migration, have crossed the Subansiri river from north to south and came to a place called Karr in the Sipi valley, which lies beyond Pij Cholo, a peak (8417 m asl) at the north bank of Kamala river is visible from the hills surrounding Apatani valley (Subansiri district gazetteer).

The district headquarter Ziro was declared as Urban during 1991 census. The Apatani valley, also referred to as the ‘Rice Bowl of Eastern Himalayas’, consists of 35 villages with a population of about 24,650 (2001 census). The statistical profile (Census of India, 2001) of Subansiri district is summarised in Table 3.2.

The Apatanis are fair in complexion, well built and medium to tall in structure. In earlier times Apatani women have distinctive tattoo on their faces. However the practice has been dropped recently. Apatani women are skillful weavers and basketry is the specialty of men folk. Their houses are made of bamboo and timber, generally compact in size. Apatanis are aggregated in large village settlements and houses are compactly arranged against each other. Incidences of fire accidents are quite common in Apatani villages during the dry months.

The Apatani society is of patriarchal type and is divided into two classes Gyuchi and Gyutii. Intermarriage was prohibited between them but at present it is seen that marriages are taking place between them. For marriage, tribe endogamy and clan exogamy is the rule. People also practice bigamy though monogamy is the general norm of Apatani society (Statistical Handbook of Lower Subansiri district, 2008).
The people are mainly agrarian in nature. Their practice of wet-rice cultivation along with fish on the same piece of land is well developed and irrigated. They also rear Mithun (Bos frontalis), pigs, cattle, goat, poultry etc. They hunt by arrows, traps, spears etc and practice fishing by nets, traps, angles etc. The surrounding environment of Apatani valley has been conserved as they do not practice shifting agriculture.

They celebrate a number of festivals throughout the year. There festivals mainly coincide with the agricultural calendar. Myoko and Dree are their major festivals. These celebrations are mainly to ensure better harvest, crop protection from pests and climatic influences and well being of all the villagers and their livestock.
### Table 3.1: A general overview of Apatani villages under study

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Hari</th>
<th>Dutta</th>
<th>Mudang Taga</th>
<th>Bamin Michi</th>
<th>Hija</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>27°48'30&quot;N 93°48'54&quot; E</td>
<td>27°34'12&quot; N 93°49'45&quot; E</td>
<td>27°34'27&quot; N 93°49'48&quot; E</td>
<td>27°34'05&quot;N 93°49'49&quot; E</td>
<td>27°34'52&quot;N 93°49'26&quot; E</td>
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<tr>
<td>Elevation (masl)</td>
<td>1559</td>
<td>1314</td>
<td>1564</td>
<td>1538</td>
<td>1536</td>
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<tr>
<td>No of households</td>
<td>256</td>
<td>90</td>
<td>149</td>
<td>89</td>
<td>344</td>
</tr>
<tr>
<td>Total population</td>
<td>805</td>
<td>404</td>
<td>547</td>
<td>345</td>
<td>1362</td>
</tr>
<tr>
<td>Male</td>
<td>379</td>
<td>179</td>
<td>250</td>
<td>156</td>
<td>638</td>
</tr>
<tr>
<td>Female</td>
<td>426</td>
<td>225</td>
<td>297</td>
<td>189</td>
<td>724</td>
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<tr>
<td>Population (0-6 yrs)</td>
<td>88</td>
<td>81</td>
<td>88</td>
<td>47</td>
<td>246</td>
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<tr>
<td>Total workers</td>
<td>429</td>
<td>183</td>
<td>214</td>
<td>135</td>
<td>607</td>
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<tr>
<td>Non-workers</td>
<td>331</td>
<td>221</td>
<td>333</td>
<td>210</td>
<td>755</td>
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<td>Household size</td>
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<td>4.5</td>
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<td>1257</td>
<td>1158</td>
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<td>39.6</td>
<td>44.75</td>
<td>34.0</td>
<td>53.87</td>
</tr>
</tbody>
</table>

*Source: Census of India 2001*
Table 3.2: Meteorological data of Ziro for three years

(Source: Statistical abstract of Lower Subansiri district)
Figure 3.1: Maps showing location of the present study sites