

Settlements and Land-Use Patterns in the Lepcha Reserve—Dzongu Zone in the Sikkim Himalaya, India

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KEY WORDS Man and Biosphere. Sikkim Himalaya. Lepchas. Dzongu Zone. Settlements. Land Use.

ABSTRACT This paper discusses settlements and land-use patterns in the Lepcha reserve-Dzongu zone and is a part of the study undertaken under the Research Project entitled "Impact of Human Activities on the Ecosystems and vice-versa with reference to the Sikkim Himalayas" under MAB (Man and the Biosphere) Programme, Unesco (Bhasin et al., 1984). The Lepcha people inhabit the forested hill tracks of North Central Sikkim. The proper use of natural resources and efficient management are the only means by which the increasing food, fodder and fuel requirements of increasing population can be met. In the Dzongu zone, the lack of proper management, together with cultural, historical, and ecological factors have resulted in the low productivity. This paper examines the shift under Bhutia and British rule from food gatherers to cultivators and lack of meaningful exploitation and management of resources.

Anthropological studies have not been carried out in Sikkim after its integration in 1975 with India. The Dzongu zone in the North Central Sikkim comprising 15,846 hectares is spread on a hilly terrain in a dense forest. It is roughly triangular in shape, bounded on the south east by the river Tista, on the northeast by the Talung river and on the third side by the mountains south of Kanchenjunga. The whole area is mountainous. Rivers are deep and the average altitude of the hills is about 4000 m. The hill slopes are steep and level pieces of land are rare. As the river valleys are low, hot, and steamy, the *Bus-ties* (village) cannot be placed by the rivers because of flash floods and unhealthy environment. The settlements and agricultural lands are sited on a relatively narrow band above the two rivers between 1000 m and 2300 m above sea level. Beyond the cultivable land is the forest and grazing land and above this is the rhododendron forest which extends to snow line. The geographical position of Dzongu zone has accentuated its isolation from the rest of Sikkim. Dzongu zone is not well connected to the district headquarters Mangan on the North Sikkim highway. A poorly maintained jeep road connects Dzongu

area to Mangan but it is often subjected to landslides and there are no other means of transportation between Mangan and Dzongu. Road is valuable to officials only and is of little importance to the local inhabitants since they still walk. Heavy summer rains cause landslides and the collapse of weak sections may close the road for many months each year. People still must walk all the way to Mangan to buy essential commodities and to sell cardamum. The Dzongu zone has not been benefitted from the development, taking place in North Sikkim, where military settlements have led to the development of a road and communications infrastructure. The inhabitants of Dzongu even now practice slash-and-burn agriculture (though restricted in areas of upper Dzongu) and grow dry rice, buckwheat, millet, and barley following a seven-year rotation cycle. They also practice sedentary cultivation of wet-rice, maize, wheat and vegetables. Cardamum as a cash crop was introduced at the beginning of this century. Although this is still a reserve area, the isolation barriers are being removed as Government-sponsored development schemes

1. Dzongu zone and Dzongu have been used interchangeably.

are implemented.*

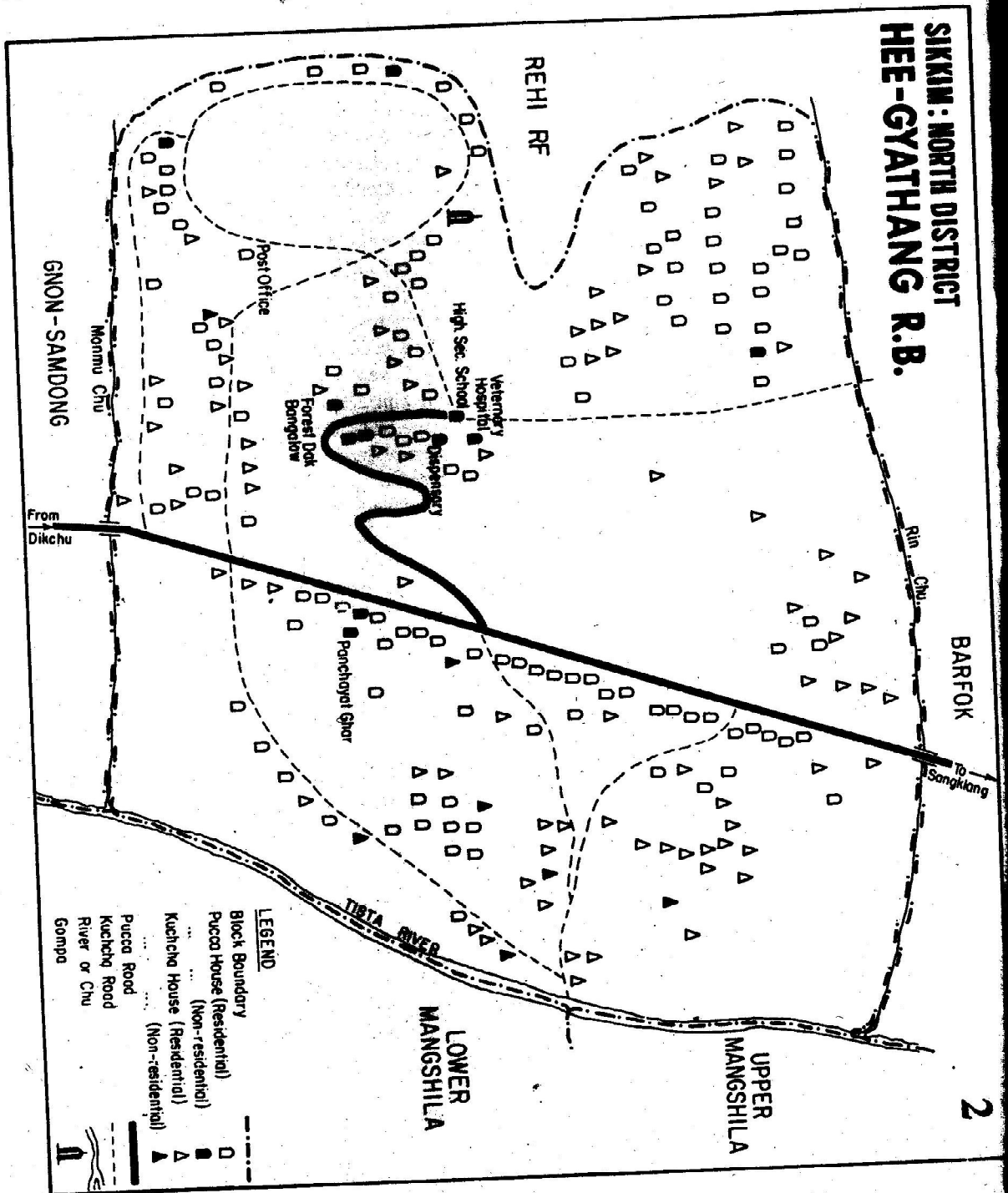
The Dzongu zone in the interior has a rich flora and fauna, abundant water resources, and a favourable climate for the growth of a larger variety of crops, fruits, vegetables, and trees. However its economic potentials have remained only partly developed. The Dzongu ground is rocky and must be cleared before preparing a new field. It requires an abundant supply of labour with an organizational structure. The small saplings must be cut and rocks dug out. Men as well as women participate in the initial clearing. Work teams (*Lobo*) are invited and are paid in food and drink. These work teams consists of family units, neighbours, *Ing-Zong* (special friends) and this labour is reciprocated. Secondary growth forests are preferred as clearing of the primary forests requires much more man-power for a given area and demands a longer drying period between burning and clearing operations. Usually buck-wheat is cultivated after deforestation.

POPULATION AND SETTLEMENT PATTERN

Dzongu zone with an area of 15,846 ha is sparsely populated with a total population of 4332 (1981). Residents of this area are Lepchas and seasonal Nepali labourers. Lepchas are the original inhabitants of the state of Sikkim (Fig. 1). Bhutias from Tibet and Bhutan arrived later. Lepchas, were nomadic hunters and food gatherers, they practised shifting cultivation with primitive technology. Bhutias were powerful in every respect and established a monarchical rule. They built *Gompas* (Monastery) and converted the animistic Lepchas to Lamaistic Buddhism. The Bhutias acquired the best land and cool hills, thus driving the Lepchas to seek new homes in lower, humid valleys. During British rule, Nepali immigration was encouraged as labour was needed for construction of roads and the extension of agriculture and therefore the ethnic scene of Sikkim changed rapidly. By 1981, the Nepalese had multiplied to comprise 51 per cent of the total population, reducing Lepchas and Bhutias

to nineteen and sixteen per cent respectively. The Lepchas were lax about marriage rules, thus losing their identity. To protect their land and identity, the *Maharaja* (king) of Sikkim converted one of his private estates—Dzongu—into a Lepcha reserve, where only pure blooded Lepchas could live and own land. This was an inaccessible tract of land with a scanty population. The entire hill area was under forest and its people subsisted by collecting natural forest produce, such as roots, tubers, leaves, grass, fruits, and herbs. The food-gathering was supplemented with shifting cultivation, where large tracts of land were cleared by burning the forest and growing crops with simple implements. Each plot was used for one or two successive years, and then abandoned. The main aim of the Lepcha reserve was to preserve the social homogeneity. However this served only one purpose—the use of land for Lepchas exclusively—but otherwise their culture was being constantly modified by external factors. From the primitive stage of cultivation, Lepchas developed agriculture, replacing shifting cultivation by more efficient methods of terracing, ploughing and irrigating lands. Although in Dzongu, Lepchas were isolated, they visited neighbouring markets, sold their products to local merchants, and bought clothes, utensils and other household items. Through contact with outsiders, the elements of change and innovations were imported and adopted. But the process of change was rather slow.

Tentatively the local people divide Dzongu in to Upper and Lower Dzongu. The terms are misnomers as the difference is not one of altitude, for they are located on both banks of a tributary to Tista which runs through the area. The area extending to Barfok (Location code No. 21) forms the boundary of Upper Dzongu and from Hee-gyathang (L.C. No. 25) starts Lower Dzongu (Fig. 2). Each revenue block is divided into a number of *Busties* (villages), but sometimes only one or a couple of house form a *Busti*. Most *Busties* are scattered on hillslopes with houses far removed from each other by vast expenses of agricultural land. Only at a few places does one find four or five houses in a cluster.



Agricultural land is found between 300 and 3000 m, but most lies below 1800 m. Communal land in the vicinity of *Busties* is usually untilled, denuded hill slope. Lepchas have traditional rights in forests where they graze their animals and collect (without cutting) firewood and fodder. The agricultural land of each family is divided into several fields at different altitudes. The *Sing* (House Garden) is in front of house, the wet paddy fields lie below and temporary dry fields above. There is common land round the village where pasturing and gathering of minor forest products is permitted. The dry fields at the upper level are cultivated every seven years. The cardamum fields are under large trees. The burial or cremation grounds are situated some distance above. As family fields are scattered temporary bamboo matted field-houses are also built and Lepchas are expert in their construction from materials (Bhasin, 1989).

The Study Area

The revenue blocks investigated for the present study are Hee-gyathang and Gnon-Samdong which lie within Lower Dzongu. Altitude ranges from 1500 to 2500 m. Hee-gyathang is bordered on the north by Ringchu and on east by the Tista River. It is separated from the Gnon-Samdong by Monmuchu. Gnon-Samdong has a block status as far as land use and survey departments are concerned under separate *Mandals*¹ but they are administered at the *Panchayat*² level under the Hee-gyathang *Panchayat*.

Hee-gyathang with a total area of 1922 ha and Gnon-Samdong with an area of 692 ha are inhabited by 756 and 174 Lepchas respectively. Other residents of the area are unauthorised tenants on an *Adhia* (share-croppers) basis. The Hee-

gyathang revenue block is the biggest in the whole reserve with 220 households, out of which 108 are of labourers (other than Lepchas).

Hee-gyathang block is composed of forty eight *Busties*, out of which 16 are inhabited (Fig. 2). The household break up is as follows:- Hee-gyathang-18; Sudur-25; Breeng-18; Ravong and Manthoo-11; Sungbu-2; Thingkyung-5; Namfyung-2; Manthyong-10; Lyngdong-4; Singrik-2; Bling Bong-7; Tartong-3; Kavar-2; Payongdep-1; Menthi-1 (Fig. 3). The Gnon-Samdong revenue block has two *Busties*, Gnon-8 households and Samdong 10 households (Fig. 4).

For the sake of convenience we call these settlements *Busties*, but in fact they have no geographical unity; the houses are either isolated in fields and forests, or clustered in small groups of three or four, but never adjoining. Lepchas call these settlements *Kyong*. When three or four houses are grouped, they are usually given a name for revenue purposes. This grouping does not necessarily correspond to any emotional or kinship ties among those neighbours the choice of house site and circumstance of inheritance are responsible for these grouping. Environmental constraints also hinder the habitation of some *Busties*, while occasionally, houses which now stand vacant were previously occupied by transient Nepali labourers who stay, wherever they find work.

Climatic Factor

Owing to its proximity to Kanchanjunga, the Dzongu zone lies in the direct path of the Summer monsoon and the climate of the valley is extremely wet, the annual rainfall being approximately 3500 mm. It rains throughout the year, except from September to the end of November. From June to September it rains continuously. As the slopes are steep, the ground dries up quickly. Humidity is high and the temperature varies according to the altitude. It snows above 2500 m. Weather is generally cool except during July and August. There is a marked difference between day and night temperatures. Mean temperature in winter is 19° and in summer 30°C.

There is a difference in humidity and temper-

1. *Mandal*—*Mandal* is a common word for the head of the village throughout Northern India. It is used among Lepchas having displaced Sikkimese—Tibetan word *La-Chen* and Lepcha word *Jen-mi*, Headman appointed by *Kazis* who in turn could rent arable land to individual families of cultivators. The *mandal* was considered as the "land-lord" of the *Busti*.

2. *Panchayat*—Block-level administrative unit.

ature between the portions of Dzongu facing Tista and those that face the Talung river. The land on the Talung side of Dzongu is more precipitous and rocky and there is less cultivable land.

Geology

The Dzongu mountains are geologically young, precipitous and rocky; the valleys are steep and narrow, the streams and rivers are swift and become rushing torrents during rainy season. The Gneiss is not so micaceous. Muscovite is rare or entirely absent. Scori and Horn blends are the chief minerals. Intrusive granite rocks occur as dykes and sills. In some of them, Muscovite is well developed. The characteristic soil is brown clay, generally poor, shallow and acidic.

Source of Water

The water supply in Dzongu valley is ample, supplied by three mountain streams, the Monmu chu, Rai chu and Rongli chu. These are perennial streams fed by melting snow of the upper hill forests as well as by monsoon rains, and they flow into the Tista river. There are also stagnant water bodies abundant with fish. There is great potential for minor and macro irrigation projects, but it has not been exploited because of hilly terrain and frequent landslides. Ground water resources are not being exploited as most of the precipitation results in surface runoff and there is little percolation. Surface runoff is abundant but most streams flow through deep gorges, making it difficult to erect dams. The only source of irrigation is the spring water during the monsoon season. Irrigation is mostly confined to paddy, cardamum and vegetable fields. The water from springs, collected in very small rivulets commonly known as *Kholso*. Large streams are called *Khola*. However, at places where streams (*Jhora*, *Kholso*, and *Khola*) have a high head, farmers have diverted the water to their paddy terraces. Once the water reaches the bottom of the hill, it is not utilised for irrigation because the pumping back is impracticable.

Excessive annual rainfall helps in vegetation growth. The hill sides are clothed with dense vegetation—forest as well as undergrowth. In the

rainy season, the whole area becomes unhealthy and feverish. Consequently habitation occurs on hill tops and mountain slopes.

Vegetation

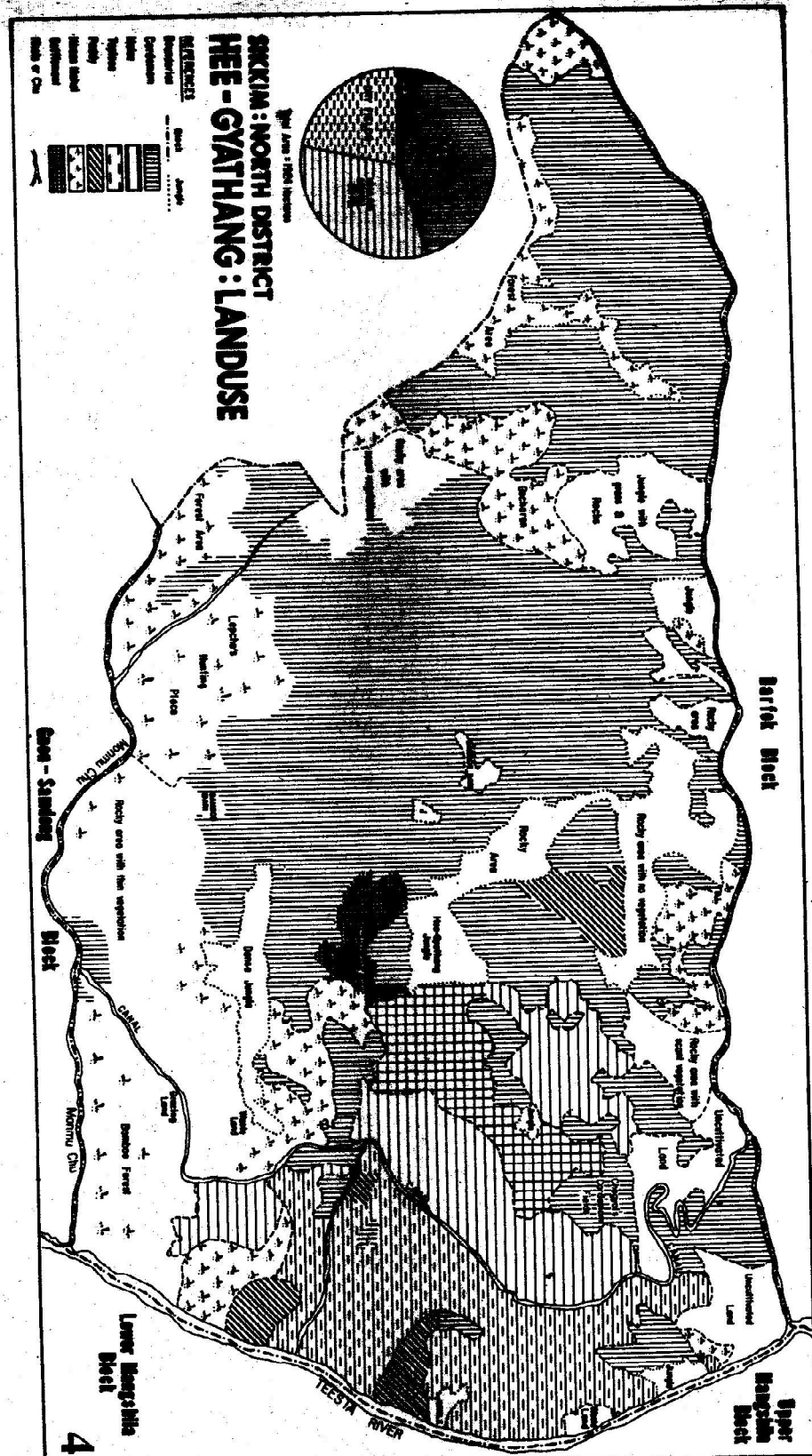
The Dzongu area is endowed with luxuriant vegetation growth, including not only timber but also many varieties of bamboo, food plants, firewood, fodder, minor forest produce, and medicinal plants. Forests occupy 9267.22 ha, out of which *Gocharan* or *Gorucharan* (Communally owned grazing land) forest is 152.30 ha and *Khas* (Communal forest) forests 9116.92 ha including both cultivable and uncultivable (cultivable 480.11 ha) land. The government has absolute right to control and manage these lands, subject to the rights of users which for the forest other than the reserves, has not yet been settled.

The rights consist of grazing, collection of firewood, cutting grass, lopping for fodder, collection of minor forest produce and in cases, timber for making houses and agricultural implements. Normally these requirements are met by *Khas* areas, land holdings and roadside plantations. In the *Gocharan* areas, there is no grass but a good tree cover; the reverse is the case in *Khas* lands or village land where people have the right to cut the trees. Here trees have been completely removed, but some sort of grass cover remains.

Altitude, geology, climate, and human activities are the important factors that influence the characteristics and distribution of natural vegetation. Dzongu forest is wet, mixed, and of evergreen type consisting mixed hard wood forests, oaks and laurels. The commonest species in this zone are *Jaman* (*Eugenia operculata*, *remosisima* and *farmosa*), *Panisaf*, *Angare*, *Chilaune*, *Bhalukanth*, and *Tarsing*. Undergrowth consists of evergreen herbs and shrubs of Rubiaceae predominate. Climbers and numerous shrubs are common.

Laurel Forest 1830-2130 m, Buk Oak Forest 2130-2440 m, High level Oak and Rhododendron Forest 2440-2740 m.

Underwood consists of *Symplocos theifolia*, *Arundibaium* spp., *Rubus* spp., *Stronilanthes*



vibrarhumi erubescens is typical of wasteland in this zone. Natural growth of *Larch* and *Utis* is plentiful. Rhododendrons of various heights are abundant in the region, becoming gradually stunted with the altitude. Although *rhododendron* leaves are mostly poisonous, the petal of some such as *Rhododendron connaibericum* are edible.

Plantation of *Uta*, *Pipli*, *Walnut*, *Champ*, *Cryptomenia* and *Arupie* occurs in 806 acres in this zone.

In the waste lands and forest cleared by fire, the following vegetation occurs—*Peptanthes sik-kamensis*, *Rosa sevicea*, *Babberts petshtzia*.

The vegetation in Dzongu forests provides the Lepcha with food plants, fuel, and commercial products. There are extensive areas of bamboo on the main outer ridges and some are also grown in individually-owned groves in the settlement area. Bamboo is the poor man's timber, used as rafters, scaffolding, roofing, walling, flooring, matting, and basketry. Tender bamboo shoots are eaten and when the bamboo clumps flower in 20-40 years (after which they die), the seed is collected and eaten as grain.

The fauna include goat, pigs, musk deer, cheetal, bears, spotted leopards, lions, gorul, rabbit, wolf, and fox. A variety of birds is found including native wild and domesticated chickens. The streams abound in fish.

LAND USE IN DZONGU

Various factors like steep slopes, rock crops, and shallow soil restrict land use.

Present Land-use Statistics

The figures on Table 1 shows that 58.4% area is under forest. Area under cardamum cultivation can also be considered as forest, because cardamum cultivation is always under shady trees.

Land-use in Hee-gyathang and Gnon Samdong Revenue Blocks

Hee-gyathang and Gnon-Samdong revenue blocks, the area under study, falls into several *Busties*, forests, cultivated and uncultivated land (Figs. 4 and 5).

Table 1: Land use in Dzongu

S.No.	Land Use	Area (in Hectares)	Percentage of Total
1.	Irrigated fields	360.8	2.3
2.	Dry fields	2909.9	18.4
3.	Fallow (<i>Banjo</i>)	129.7	0.8
4.	Cardamum	3179.3	20.1
5.	<i>Khas</i>		
	(i) Culturable	480.1	3.0
	(ii) Unculturable	8636.1	54.5
6.	<i>Gocharan</i>		
	(i) Culturable	144.8	0.9
	(ii) Unculturable	7.4	—

In Hee-gyathang out of 1922.93 ha, only 48.42 ha and in Gnon-Samdong 17.48 ha have been irrigated. A 3 km. long irrigation channel has been taken out from Monmuchu. It has benefited only a fringe of the population of low lying *Busties* of Sudur, Manthyong, and Tartong. One more channel is under construction in Hee-

Table 2: Land use in Hee-gyathang and Gnon-Samdong

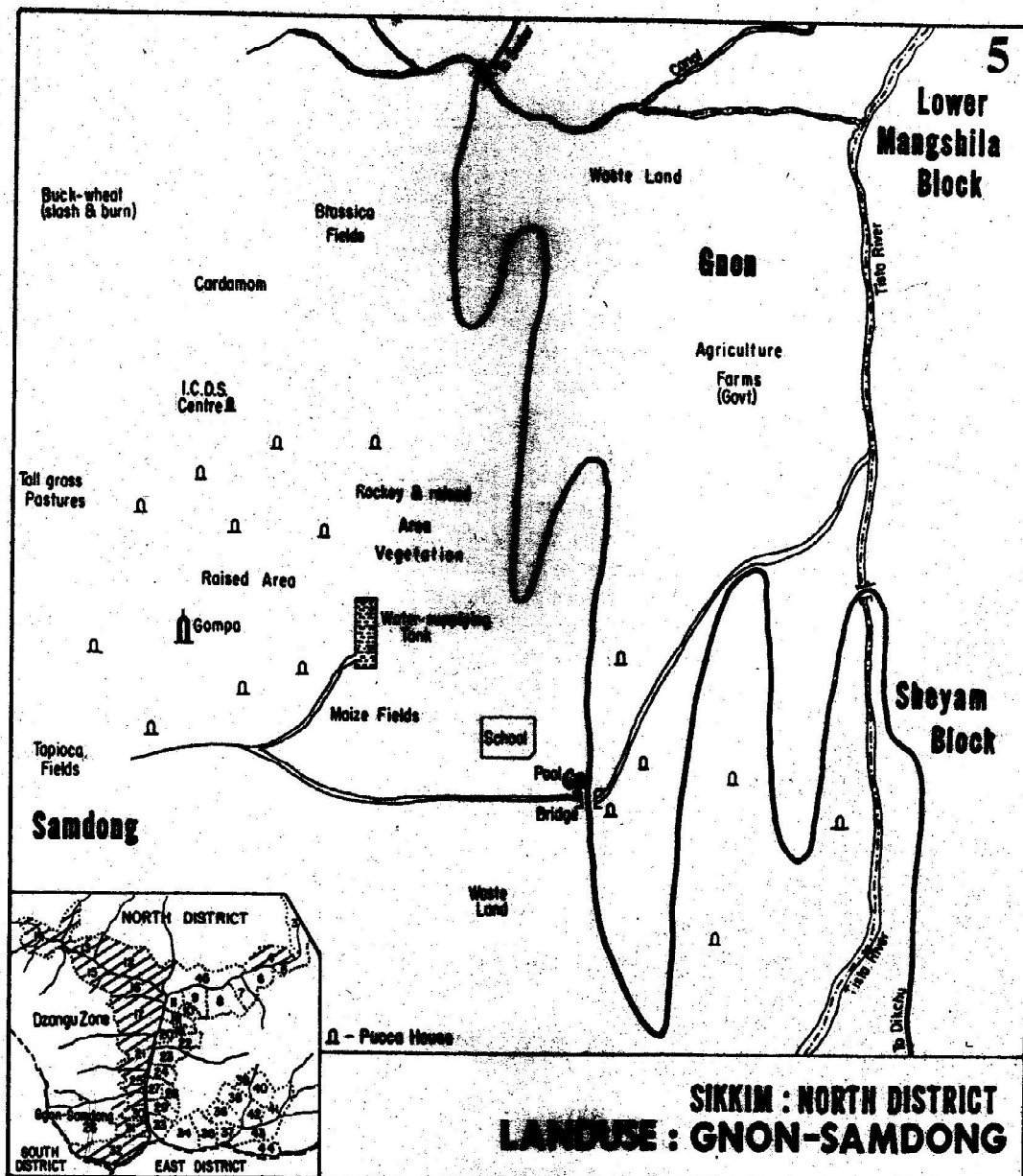
Land Use	Land (in Hectares)	
	Hee-gyathang	Gnon-Samdong
Total land	1922.93	692.17
Cultivated area *	1275.19	260.68
Uncultivated area **	9.96	4.71
Area under Forest ***	637.78	431.48

* Cultivated area includes all dry fields, paddy terraces, cardamum fields, tapioca, and orange orchards.

** Uncultivated area includes waste land either because it is too steep or inaccessible or consists of rock outcrops.

*** Forest include *Khas* and *Gocharan*.

gyathang. Small trails emanate in all directions from water sources to the fields and to neighbouring houses and *Busties*. The trails are for the most part rough, steep and often dangerous. Of 430.74 ha of dry fields in Hee-gyathang, only fields at higher altitude are rain-fed and elsewhere water is brought from *Jhoras* (water falls) or *Kholas* (streams) for irrigation purposes by channels constructed by joining a number of bamboo poles. The Lepcha terrace the



fields only for wet paddy cultivation. If the land is unterraced, irrigation poses the danger of landslide and soil erosion. Even if the land is terraced, sometimes excessive rain, hailstorms, and erosion damage the landholdings. Not all the land is equally prone to these environmental hazards. Wet paddy fields are more vulnerable than temporary fields and so farmers usually make wet paddy fields at lower altitudes on hill sides of gentler incline. Terraces are horizontally cut and irrigation canals are properly maintained. Bamboo fences are constructed to help control river bank erosion and orchards are planted on contour strips. The unterraced maize and vegetable fields are situated above paddy terraces which acts as filters and buffers against erosion. Though the physical nature of the environmental hazards is evident, people associate hazards with supernatural causes and try to appease spirits and gods.

Lepchas have adapted culturally to diverse natural landscape and have designed production activities suited to the region. Three major biogeographical provinces of human land use can be identified in this area:

- (i) The upper slopes of the hills (1800-3000 m);
- (ii) The lower and temperate zone of minor valleys and (900-1800 m);
- (iii) The valley floor, peripheral valley bottom (300-900 m).

The fields of a family are at different places at varying altitudes. The temporary dry field (*Sukha bari* or *Sudyom*) are on upper slopes of the hill where barley (*Hordeum vulgare*), buckwheat (*Fagopyrum esculentum*), millet (*Paspalum scorbiculatum*) and dry rice are grown. The house garden (*Aangen bari* or *Sing*) at lower level has wheat, maize (*Zeynays*), soyabean and vegetable cultivation. The valley floor and peripheral valley is used for paddy cultivation. The cardamum (*Amomum subulatum*) fields are always under shady trees. On the hill slopes Tungrukbuth (*Manihot-esculentus*) cultivation is practised. The land under dry cultivation is not under constant use, the fields are used on rotation of seven years.

In this study thirteen types of land use are recognized:

(1) *Sing* (House Garden): It is the field in front of the house and field immediately surrounding the *Busti* area. The multicropping and interculture of crops are practised. Two crops are grown annually, first a mixture of wheat and barley followed by maize and soyabean. A number of vegetables, fruits and root crops are also raised on the embankment of the house garden. Because of continuous care, irrigation by hand or bamboo pipes, and continuous manuring the soil is fertile. Wheat and barley are grown in December and harvested in March-April. Maize is planted in between February and May and harvested in September-October. Millet (*Paspalum scorbiculatum*) can be grown as mixed crop with maize. Sowing is done in June-July and harvesting in October-November. Traditionally, millet was grown in temporary fields only, but mixed cropping has been introduced in the area recently by the intensive campaigning by the Agricultural Department. Local varieties in use are (1) *Muske*; (2) *Mangkatira*; (3) *Pangdoor*. *Pangdoor* is cultivated by broadcasting and other varieties belongs to a transplantation type. *Mangkatira* is a rain-fed crop and shows considerable drought resistance. It is ideal for making local beer. *Chi*. Its coarse grain occasionally ground for *Champa* (flour). It is grown for both grain and forage.

Soya bean (*Avena stiva*) is also grown mixed with maize, it is generally sown in May when maize is 30 cm high and harvested in September-October. Its cultivation has gained momentum after the introduction of some high yielding varieties.

(2) *Sudyom* (Dry fields): Agricultural land where irrigation is not possible barley (*Hordeum vulgare*); millet (*Paspalum scorbiculatum*); buckwheat (*Fagopyrum esculentum*) and dry rice are cultivated. *Kalodal* (*Phaseolus vulgaris*) is cultivated on the boundaries of the dry rice. Two crops of buckwheat can be obtained in a year. The first crop can be produced between January and May and the second can be sown in June-July and harvested in December. Two types of buckwheat are grown in Dzongu (1) *Kurhoo*,

bitter in taste and (2) *Korhat* is the sweet variety. Barley is cultivated every alternate year with wheat. Dry rice is sown in April and harvested in November-December. The cropping time of dry rice is two months earlier than that of wet-rice. A rice variety, locally called *Tokmaro*, which requires seven months for ripening is grown. It appears that *Tokmaro* rice is one of the relics of the primitive varieties of dry rice which differs in height, colour, and ripening time.

All upland crops are sown in the early pre-monsoon season. For shifting cultivation, land is cleared of vegetation by chopping during the winter time and left to dry. The adjustment of cropping calendar to onset of monsoon is necessary. The dried twigs and leaves are set afire just before the start of rainy season and the fields are immediately sown so as to avoid growth of weeds. This type of agriculture, though known as monsoon agriculture is in fact pre-monsoon agriculture.

(3) *Cheekboo or Pani-Khet* (Irrigated Fields): Where water is available for irrigation on the side of a stream or valley floor paddy cultivation is found. Water is taken from a river or stream and diverted into the fields by means of bamboo pipes. Rice seeds planted in nurseries are allowed to grow till they are old enough to transplant. A portion of land above the paddy terrace is left unterraced and in this maize, millet and vegetable are cultivated. Irrigation-cum-drainage channels run across the terraces and serve as field boundary. A few bamboo groves, orchard (orange) and fodder trees are grown at channel embankment. Paddy is generally raised as mono crop. Recently an attempt has been made by agricultural department to encourage Lepcha to grow *Musem or Kalodal* (*Phaseolus vulgaris*) on the boundary of the paddy terrace.

Seven varieties of wet rice are grown on water logged terraces without manuring, up to 1500 m are *Small Otte*, *Timburing*, *Birum Phool*, *Tulasi*, *Marsi*, *Takamaru* and *Thapachan*. Of these two varieties can be grown at higher altitude and other five at the lower one. These are grown in rotation to give rest to the soil.

4. *Cardamum or Elaichi Khet* (*Amomum*

subulatum): Large cardamum is the cash crop in this region and is grown as pure crop under shady trees on hill slopes. Four varieties: *Ramsey*, *Sawaney*, *Golsey* and *Rannagit* are cultivated in the area, by sowing seedlings in nurseries or by separating rhizomes from clumps of longer plants. It is planted in May-June and harvested between August and November. After separating from harvested penicles the fruit is cured or dried in the kiln. The crop prefers plentiful and well distributed rainfall, generally over 200 mm per annum and an altitude range between 600 and 1800 m.

The cardamum is the cash crop of the area, yet a considerable extent of feasible green areas in Dzongu are devoid of cardamum cultivation. The reason being the unavailability of finance for the rhizomes plantation. The virgin forests which can be utilised for the cardamum plantation, are instead burnt and used for seasonal crops. The cardamum is not only cash crop, but it also helps in soil conservation. The reserve forest can also be used for the cardamum plantation which will provide labour to local people. Apart from expansion of existing area, the large part of existing unproductive plants (owing to age and disease) have to be rejuvenated. Government is planning to station a mobile plant protection unit in the area. There are no proper cardamum drying and storage facilities at present. Government of India has established a Cardamum Board recently. Ten scientifically based community driers will be established in the area at different locations. Metal storage bins will be installed for the dried seeds and cardamum co-operative bodies will be formed for the marketing of cardamum, which will arrange for the carriage of cardamum. Initially two co-operatives will operate in Upper Dzongu and one in Lower Dzongu. The harvested produce will be transported to auction centre and from there to other parts of the country. The farmers will receive the payments directly instead of middle men taking the major share of profit. Four fair price shops have been established at Mangan, Dickchu, Kabi and Chungthang. Credit is available at these fair price shops, which is repaid in harvested cardamum. The vil-

lage money-lenders charge high rates of interest.

Various social forestry schemes have been implemented in the area. Under the State Development Plan Nurseries have been created for demonstration and education, and free distribution of fruit plants like orange, guava, peach, plums, tree tomatoes, apples, thin shelled walnut on two acres in Dzongu.

The department has acquired 4.4 acres of land at Hee-gyathang and Lingdong for the cultivation of grass—*Citronella* sp. The grass will be used for extraction of aromatic oil and in Ayurvedic medicine.

5. *Tungruthbuk* or *Tapioca* cultivation (*Manihot esculenta*): On the hill slopes are cultivated herbaceous, tall branched, shrubs with elongated tuberous roots. This tuber is rich in starch and can be commercially exploited to obtain starch, sago, and flour. The plant is cultivated during the month of March. Totally pulverised soil is sought, unpulverised soil is sifted by hand picked and discarded. The older part of the stem is grown at a distance of about 150 cm from one plant to another. They sprout during June and August, when the plant is about to produce tubers, the basal part of the plant is added with more soil from the surrounding area, so that the growing tubers do not come out of the soil. During December and January, the tubers are harvested or taken out.

The vegetative parts are eaten by goats and some older parts are kept in store for next cultivation. There are two varietics—red and white, the latter being used for beer preparation and the

former for *Kaza* preparation.

6. *Suntala* (Orange) cultivation (*Citrus reticulata*): Dzongu, by virtue of its soil and altitude is potentially promising place for orange cultivation. It is planted after clearing herbs and shrubs in small pits. Pruning is done periodically only in the side branches, the top of the plant is left unpruned. To build up soil fertility, legumes are intercropped. During summer, vegetables such as cucumber, brinjal, and chillies and in winter radish, cauliflower and carrot are grown. Orange trees occupy 6.8 ha in the whole of Dzongu. They are scattered and never form an orchard.

7. *Banjo* or *Fallowland*: Non-agricultural land, sometimes used as pastures for cattle or kept as grassland.

8. *Land which has been affected by landslides or other types of erosion*: it may have been an irrigated terrace, or dry fields or forest land before destruction.

9. *Land, covered by large rocks and stones*: It can rarely be upgraded into agricultural land and is thus useless to the farmers.

10. *Gocharan*: Land enriched with grasses and used for grazing cattle. It is communally owned grazing land.

11. *Khasland*: Communal forest or jungle which fulfils the local need of the people and supply them with most of their daily needs.

12. *Reserve Forest*: The state government has full power to control and manage these forests.

13. *Busti* (Settlement): The settlements are scattered widely on hill slopes.

Table 3: Sowing and harvesting periods for different crops

S.No.	Crop	Sowing Period		Harvesting Period	
		From	To	From	To
1.	Maize	February	May	September	October
2.	Rice	June	July	November	December
3.	Wheat and barley	November	December	March	April
4.	Buckwheat	February	March	June	July
5.	Millet	June	July	December	January
6.	Cardamum	May	June	August	November
7.	Tapioca	March	—	December	January

Table 4: Calendar of economic activities.

<i>Kur-nyit (Lepcha)</i> <i>January-February (English)</i>	<i>Kur Song</i> <i>February-March</i>	<i>Thon</i> <i>March-April</i>
Preparation and manuring of buck-wheat fields; fencing of gardens; collection of firewood.	Levelling, ploughing and sowing of dry rice fields; sowing of maize; weeding of cardamum.	Harvesting of wheat and barley, preparation of house garden for vegetables sowing. Cutting of bamboo for fencing of paddy fields; rice terraces and irrigation canals are repaired; Planting of <i>Tungruthbuk</i> (Tapioca) stems.
<i>Sam</i> <i>April-May</i>	<i>Nun tsam</i> <i>May-June</i>	<i>Blung</i> <i>June-July</i>
New fields are opened by cutting weeds, smaller plants, drying and burning of these; bigger plants are cut and carried home to be used as fuel; digging of fields, irrigation channels are made. In the old fields selected for paddy this year, bamboo fences are made to keep off domestic and wild animals. Some men go out hunting, trapping and fishing. Harvesting of buckwheat.	Fenced in fields are prepared for sowing by cutting off grass and soaking the fields with water through water channel. In the muddy fields, some rows and terraces are made in which rice seeds are sown to make nursery. Harvesting of barley and in the same field maize is sown. In June, Paddy plants grown in nursery are transplanted into fresh fields, sowing of millet seeds.	Transplantation of paddy continues; weeding of maize in dry fields. Heavy rains hinder outdoor work; Indoor jobs are carried out; wicker work articles are made.
<i>Nun Kam</i> <i>July-August</i>	<i>Pur vim</i> <i>August-September</i>	<i>Glu</i> <i>September-October</i>
Millet is transplanted into dry fields under maize crop; first weeding of wet rice; covering of basal part of Tapioca stems with soil to ensure proper growth.	Weeding of millet fields; sheds for drying of cardamum are made.	Second weeding of wet rice, harvesting of millet and cardamum.
<i>Ect</i> <i>October-November</i>	<i>Pa</i> <i>November-December</i>	<i>Max</i> <i>December-January</i>
Harvesting of paddy; sowing of wheat and barley.	Harvesting of pulse; storing of seeds in grainaries; weeding of paddy and gathering of Tapioca.	Gathering of fire-wood for rainy season; cleaning of the stubble of the maize, millet and barley, preparation of fields for sowing. Mixing of dung of oxen, goats and pig collected during the year with water and spreading it in fields. Tapioca gathering continues.

CROPPING PATTERN

The cropping pattern is fairly intensive as can be seen from the variety of crops grown in the area. Multicropping and interculture of crops is practised. Wheat, maize and barley intercropped

in house fields: a mixture of wheat and barley followed by maize. The temporary fields yield main crops of dry rice, millet, and buckwheat after deforestation. Animals or large implements are not used by Lepchas in *Sudyom* cultivation. Implements used are chopping knife, sickle,

Thingyel (Dibbling stick), small hoe for weeding and *Aunzo* (a special sickle) for harvesting. The only inputs are seeds and human labour. Ploughing is done on larger terraces with a pair of bullocks.

As the family has fields at different altitudes the requirements of the family are met. Early ripening varieties of dry rice and millet are cultivated in the small valley fields and the main crop is grown in bigger fields at higher altitudes. Only one field of dry rice and one of main crop millet is cultivated yearly. Nevertheless only one major crop is obtained each year from each plot. Two sowings of buckwheat are done annually, a large one in February for food and a smaller one in September for seed. This is the only case in which two crops of the same cereal grain are obtained in one year. Occasionally, if the maize produced in the home field is not sufficient, some maize is cultivated with early millets in the temporary fields. The main crop of barley (*Kachar*) is cultivated at higher elevation to the *Kokshi* (other variety). *Kokshi* is double cropped with either maize or buckwheat.

In the dry fields, in November-December, after millet or rice are gathered, the fields are sown with buckwheat which is harvested in June-July and the fields are left fallow for seven years.

From October to December, Lepchas have free time. Wedding and feasts, postponed during the year, take place at this time. Repair work of all types is also finished. Canes and rafters of house roofs and stone walls surrounding their fields are mended. New tools are made or old ones repaired.

There is very little divisions of labour among the Lepchas. Most work is done in groups containing both men and women. There are very few tasks which may not be performed by either one. Even supposedly female tasks, such as cooking or looking after the children may be performed by men, though only occasionally. There are no hard and fast rules about this. The only male activity never undertaken by women is ploughing. Agricultural activities performed by women are almost equal to those of men. Their labour is interchangeable with those of men in com-

munal work parties and are paid the same amount as an adult men.

Labour Force participation

The economically active population on the basis of their participation in one or another activities show that only persons above age ten were so active. The participation rates in the different age-groups show some variations between males and females. In the age-group 10-14 more females, appear to be working than males. This may be due to lack of interest in educating girls. In the next higher age-group (15-19) the ratio of males and females working is virtually the same. In the age group 20-29 more females appear to be working than males but ratio of working women falls sharply in age-group 30 and above, it being only 79% against 90% for males.

Overall above 67 per cent of both males and females over 10 years of age appear to be economically active. The total participation rates for males, females are 47.94 and 46.77% respectively. This rate is more or less the similar to North District (46.5%) as obtained in the Census 1981. However if we calculate the actual working hours and day in a full year the entire picture is different. The Lepchas' day starts between five and six in the morning. After taking their breakfast, they start for their fields which are at considerable distance. Women work in the house garden. On the way, Lepchas stop at various spots for gathering fungi etc. After working for four hours, they take their afternoon recess, during which they take some snacks which they had brought from home. Then work for three-four hours more, they return home for the evening meal. When they are working at far-off fields, they spend their nights in the field house but then their extra time is spent in gathering and cooking food. When men are working in the fields, women work in house-garden, cook food, and look after the children. In the evening, they visit each other or sit and chat and drink *Chi* (local beer). This is their routine for working days which is often interrupted by ritual and festivities, the main chore of their social life. There are regular bi-monthly feasts in *Gompa* spon-

sored by two families in turn; and in most months there are one or more calendrical lamaist festivals; religious ceremonies regarding *Mun*¹ and *Mayel* beings, ceremonies concerning birth, marriage and death; Lepchas perform curing and purification rites and maintain similar beliefs about the supernatural and man's responsibility to supernatural. These serve as social occasions where large number of people come together for drinking and general gaiety. Beside these, there are number of visits; married women return to their native village with their children or in-laws; young men go to visit their *Asek* (fiance) bride, accompanied by a friend or relation to help carry the presents; *Ing-zong* (special friends) or trading partners come on a visit or visited. All these visits are occasions for feasts but not as big as the *Gompa* or other ritual feasts.

Lot of time of entire community is spent in Bi-monthly feasts and certain calendrical festivals like *Boom-ker* or *Cherim* ceremony, where people spend two-three days for each ceremony in only eating and drinking. The drinking is the greatest social evil in Dzongu. All the Lepchas, men, women and children, drink in great quantities. All social and religious occasions are an excuse for drink party.

DISCUSSION

The Lepchas are by tradition a forest people. Dzongu forest with its diversity of ecology, with its variety and abundance of resources, was potentially an area of importance. The Lepchas resided almost exclusively within the forest and concentrated almost entirely upon its resources. Dzongu forests are rich and abundant and apart from supplying wood for fuel, timber for houses, fodder for animals, they also provide food for Lepchas in emergencies. Gathering and hunting had been a way of life. Lepchas still indulge in these activities. Most of the collection is done daily, but during the three months from June to August, when the food supply is sparse, the gathering becomes large scale. Gathering on small

scale takes place daily, on the way to their fields, Lepchas stop at various places, shrubs and rotten logs to inspect for various edible fungi etc. Besides bamboo shoots, number of other forest products are used as food substitutes, mushrooms, tubers, wild fruits and wild honey. Various edible plants are collected and steamed.

The only real evidence for the economic situation of the Lepchas comes from historical sources and travel accounts. The Lepchas used to practise slash and burn cultivation. This was supplemented by gathering, hunting and fishing. Very steep slopes were cultivated, resulting in a total loss of vegetation cover. Out of a very rudimentary form of slash and burn cultivation, which at one time probably covered large areas, Lepchas have developed more intensive and productive agricultural system.

Within the existing agricultural system in Dzongu, a mixture of different farming systems is exhibited: upland crop farming, rain-fed rice farming, wet rice irrigated and dry farming harmonious with the existing environmental conditions. The present agricultural system is the historical product of the interaction between three different agricultural complexes—The original Lepcha complex, influenced by the Tibetan and Nepali complex which in turn is influenced by Indian complex.

Though Dzongu has been Lepcha reserve since long, but cultural borrowings and cultural integration has been going on since the advent of Bhutias, before the British and Nepali intrusion. Lepchas of Dzongu have been willing to accept the changes resulting from different contacts. Insecurity of food and their nature may have been reason for the Lepcha receptivity for change.

Strains of Lepcha Type Agriculture

Glimpses of Lepcha slash and burn agriculture are available in Chornicle (Gaz. p. 18). Campbell in 1840 also described the shifting nature of Lepchas along with their agricultural land (Campbell, 1840, p. 387). They grew dry rice without irrigation (Hooker, 1855, 1980 p. 193). By the middle of the last century, wet rice cultivation was introduced in the area. Waddell

1. Mun-Lepcha's original religion, prior to the introduction of Buddhism.

has described the Lepcha farm, ".....a small plot fenced in by thorny branches, for a few gourds, turnips and chillies and beyond this a few small crops of maize, barley, millet for beer, and a little terraced land for irrigated rice. This scanty cultivation, if it may be dignified by such a term, is usually a merely scratching of the ground, and is done mostly by the women, while the men do the hunting" (Waddell, 1900, p. 95-96). The spread of the practice of wet paddy cultivation was probably slow, because it reached Dzongu, where Morris and Gorer worked in 1937 in Lingthem, rather late. Morris described "The method of rice under water in terraced fields..... was apparently only introduced in Lingthem some twenty years back" (Morris, 1938, p. 127; Gorer 1938, 1967, p. 90). Waddell has described the Lepchas as the aborigines of country, "they represent the state of man when he subsisted by hunting, fishing and gathering wild fruits and digging roots; and now they are a vanishing race, fast disappearing before the tide of emigrants from the more active and civilized tribes who have lately swept in great waves into their country" (Waddell, 1900, p. 91-92). Probably, Lepcha's shifting cultivation, in association with gathering of minor forest produce and hunting, was sufficient for their survival. Although slash and burn agriculture has almost disappeared from the Dzongu, traces of original can still be observed, higher up in Random and Ravond Busti where some Lepchas are still practicing it. In other parts of Dzongu, slash and burn cannot be seen in its typical form. Instead it has taken the form of fallow field system in which plots are cultivated for two or three successive years, fallowed for seven or eight years and then recultivated. Tall grass covers the plots during the period of fallow. Time between abandonment and recultivation is too short for woody vegetation, and it is easier to cut and burn. Besides shifting cultivation, Lepcha cultivate and gather various tubers which are used as food, and grow upland rice by *Zomal*¹ cultivation. Maize, millets and buckwheat are cultivated on hill sides in dry fields.

The elements of shifting cultivation, having tubers and upland rice farming, buckwheat, maize, combined with gathering, hunting and fishing forms the Lepcha agricultural complex.

Strains of Tibetan Agricultural Complex

With the advent of Tibetans, in the seventeen century (1641) a monarchy of Phuntsong Namgyal was established. This resulted in mass migration of Tibetan Bhutias to Sikkim and dominance of ruling class and subjugation of the Lepchas. Conversion of Lepchas to Buddhism and replacement of their scriptures. New Tibetan ideas infiltrated into Lepchas culture. Wheat and barley associated with manuring were introduced as winter crops. The buckwheat and maize are summer crops.

Wet Rice Farming or Indian Agricultural Complex

In early nineteenth century they came in contact with Bhutanese and Nepalese. Sikkim got involved in the Anglo-Nepali war of 1814-15 and allied with British in this dispute. British brought new type of administration and certain measures to stop exploitation were introduced, one of them was the creation of Lepcha reserve—Dzongu by *Maharaja*. New ideas infiltrated the Sikkim State. Though, wet rice farming has a history of 4000 years in the Indo-Gangetic plains. It was introduced in the Dzongu zone very recently with the advent of migration of Nepali labour in this zone. This type of wet rice contrast sharply with the upland rice farming. In wet rice cultivation ploughing and thrashing by animals is common, while in dry rice cultivation manuring, hoeing, seed sowing by dibbling and thrashing by hands are prominent. Lepchas have adopted the new technology of the wet rice farming and incorporated into their traditional system. They cultivate the dry fields at high altitudes, and newly opened up wet rice terraces at lower altitude.

In the beginning of the century, cardamum was introduced as a cash crop in the area. Money also entered the economy of Lepchas. Lepchas readily accepted the rice and cardamum cultivation along with Nepalese rituals and taboos

1. *Zomal*—Rice cultivation in dry fields after deforestation.

concerning cardamum cultivation. The Lepchas economy may be characterized as partly subsistence and partly commercial. The Lepchas of Dzongu grow wheat, paddy, dry rice, millet, buckwheat, maize and barley as staples and cardamum as cash crop. Although based on the cultivation of crops, the economy of the Lepchas of Dzongu has number of other facets, the main being cultivation of large cardamum and gathering of forest produce.

In the post independence era, and integration of Sikkim into Indian Union resulted in further changes brought by development programmes. Cultivation of Tapioca (previously they only gathered various types of tubers), soya bean, vegetables and fruits have been introduced recently after opening up of the area to development programmes.

Lepcha's adaptive nature can be explained by insecurity of food and poor technology. Lepcha agriculture is still primitive, farming is a way of life rather than business proposition. The shift from slash and burn cultivation to wet rice cultivation and cardamum cultivation is a rational economic decision and shows a preference for a system which promises better rewards. When in contact, Lepchas show tendency to select those cultural traits which can easily reconcile with their own existing cultural pattern. the greater freedom of choice has more degree of selectivity. This is true of the Lepcha case and helps to explain the apparent paradox that Lepchas have probably changed the least while changing the most. The nature of the contact situation has made it possible for Lepchas to accept certain innovations, modify certain elements of their social, religious, economic and political structure in order to accommodate changes and retain their basic pattern of community structure and co-operative character. One thing which has not changed yet is their tradition of living only for the present and not worrying about the morrow.

The average operational holdings of the cultivating household is 9.34 ha, which is considerably higher than the state average of 2.56 ha as per 1976-77 agricultural census. This higher average is due to presence of vast area of car-

damum in Dzongu. The detailed records of land holding pattern are not available, because till recently Dzongu was a Private Estate of the King. Operational holdings include house-site, steep-slope, land slide, rock, marshy place, jungle with cardamum, jungle without cardamum, area occupied by trees and bamboo other than jungle grass land, planted grass and thatches, orchards, cultivable but not cultivated for more than 5 years, not cultivated for more than one year but less than 5 years, current fallow, actual area cultivated, monocrop area including irrigated and unirrigated.

The land holding of a household is divided into number of fields some permanent and other temporary, used after a fallowing of seven or eight years. Permanent fields are rice terraces, cardamum fields and house garden. The temporary fields are cultivated for successive two years and are abandoned for seven-eight years. The nature of the terrain has resulted in small and scattered land holdings. The small landholdings are the result of the nature of the tract, steepness of the slope, fragmentation of land on break up of a joint family. Steepness of the slope and the rocky nature of soil does not permit terracing of large fields.

Because of the ecology of the area and lack of technological know how, Lepchas were forced to practise shifting cultivation on small and scattered areas of soil suitable for tillage along with hunting and gathering. The fields cultivated were widely scattered and abandoned after few seasons. The resultant pattern of settlement was highly dispersed and mobile and it generally lacked a political and economic organization. They abandoned both their fields and dwelling sites every three to four years and moved on to fresh territories. Years ago, Lepchas in these regions discovered that fire was a useful ally in clearing land of wild vegetation and for years fire has supplemented handcutting operations. Agricultural methods were primitive and yield per acre per man was low. Maize and *Zonal* rice grown by dry method were not sufficient for the entire year, tubers, roots and leaves were collected to supplement the meagre grain. With no

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Because of the ecology of the area and lack of technological know how, Lepchas were forced to practise shifting cultivation on small and scattered areas of soil suitable for tillage along with hunting and gathering. The fields cultivated were widely scattered and abandoned after few seasons. The resultant pattern of settlement was highly dispersed and mobile and it generally lacked a political and economic organization. They abandoned both their fields and dwelling sites every three to four years and moved on to fresh territories. Years ago, Lepchas in these regions discovered that fire was a useful ally in clearing land of wild vegetation and for years fire has supplemented handcutting operations. Agricultural methods were primitive and yield per acre per man was low. Maize and Zomal rice grown by dry method were not sufficient for the entire year, tubers, roots and leaves were collected to supplement the meagre grain. With no

surplus production, there was little need for trading centres. The role of animals in this type of agriculture was limited. Out of a very rudimentary form of shifting cultivation, Lepchas have developed more intensive subsistence agriculture. They have semi-shifting type of cultivation wherein farm dwelling remain fixed but the farmers change their fields, throughout the environs, actually abandoning the fields, turning them back to wild vegetation after two years of cropping.

Agricultural work in Dzongu is very arduous. In every sphere, the consumption of labour has increased by the absence of tools. Men and women are busy throughout the year. The hillsides are extremely steep and rocky so that communications are still primitive. Almost all travel is done in foot. Practically everything is carried on human back.

In the absence of irrigation facilities, in this form of cultivation, maximum reliance is placed upon environmental features like rain, soil etc. The tools employed are few and rather simple. Human technological intervention to either control or improve the environment is minimal, consisting of planting, cultivation and harvesting. Though this type of agriculture improves the environment as a human habitat, man does not secure himself against the loss of the advantage through flood disaster, drought or crop failure. Hence this type of agriculture, though intensive is still a type of subsistence. At this level of pre-industrial agriculture, people attempt to intervene with nature to secure more reliable productivity. This is achieved through levelling and terracing of land, and related operations. The techno-environmental factors determine the relative proportion of the crops. The people cultivate a wide variety of crops, taking advantage of various soil types at different altitudes. This also provides an insurance against devastation from crop-specific diseases and pests. Drought resistant and moisture tolerant species are grown. The variety of crops together with the practice of manuring, fallowing, crop rotation and crop mixture, all enhance the productivity and reliability of food supply. With-

out machines, these activities require the co-ordinate efforts of manual energy.

As the agricultural implements are simple and the Lepchas follow traditional way of agriculture, it would seem that the economic life of Lepchas has remained unchanged. Such a conclusion would be erroneous. Although the rate of the economic change is slow, but changes have occurred in the Lepcha economy.

Lepcha fields have become an important feature of a complex ecosystem. Because the crops are planted at different time during the year, and their maturation is not uniform, fields with inter and multicropping and boundary cropping, is a mixture of food stuffs for nine months of the year. A normal household grows eight to ten different food plants in different fields at any one time. Lepcha farming is basically crop intensive.

Out of rudimentary form of slash and burn cultivation, which at one time probably covered all the Lepcha land, Lepchas have developed more intensive, sophisticated and productive agricultural systems. At present, in Dzongu, shifting agriculture in the typical form can no longer be said to exist. Instead it has been superseded by a kind of fallow field system in which fields are cultivated for two years successively, fallowed for seven year and then recultivated. The reason for the continuance of the practice is linked up with ecological, socio-economic and cultural factors, including the lack of communication leading to physiographical remoteness and isolation.

The introduction of cash crop (cardamum) and paddy in the area were very important. The most important techno-environmental factor was the construction of irrigation channel last year that has permitted cultivation of some crops that would otherwise have been difficult. New varieties of crops, tested and developed in government experimental farms are being introduced in the area. Crop mixture and crop rotations, improved seeds, fertilizers are being suggested by the agricultural departments. Almost all these innovations had an extraneous origin. the villagers' decision to accept or reject these technological reforms depend on their rational economic

considerations and availability of the resource.

There is no doubt that Lepchas could produce a surplus of food over the full production cycle with a little extra labour and improvement of technology. However, as conditions stand now, there is no indication that they will do so. In Hee-gyathang, 41.3% of the total cultivated land is under cardamum cultivation, because it requires less attention once it has been planted; 26.3% is under dry cultivation which does not require the making of terraces and water channels. Only 3.3% of the total is under paddy and other crops. The preparation of paddy terrace and cardamum fields demand more time and hard work but the remuneration is greater. The cardamum rhizomes are planted every ten years but once planted little labour is required to obtain a crop. It only requires weeding. On dry fields Lepchas grow millet, barley, dry rice etc. which is used for making *Chi*, Lepcha's favourite drink. They spend a great deal of time in ritual ceremonies, dancing, feasting and drinking *Chi*. At certain festivals, where other people spend three hours in ceremonies, Lepchas of Dzongu spend three days. A good deal of this time could easily be devoted to cultivation.

The subsistence economy of Lepchas, supplemented by gathering, hunting and fishing is one of abundance and reliability. Lepchas say that as long as the forest is there, there can never be a shortage of food, let alone any danger of starvation. There had been no qualitative and quantitative systematic analysis of the nature and extent of such dependence. Nutritive value of these plants and animals and such is not known but Lepchas derive a significant portion of their nutritional needs like animal protein from animals. With low human population density and high plant and animal density, Lepcha could afford a broad base of subsistence. With an increase in population and decrease in forest base, Lepchas reduced the hunting and gathering activities and started domestication of plants and animals. Though the major portion of their nutritional requirements are met by domesticated plants and animals, these resources are supple-

mented by hunting and gathering.

Hunting and gathering continued in Dzongu, because of ecological reasons like high rain fall which had helped in retaining a good forest cover, low population density and partial dependence on agriculture. Historical factors, no doubt have played their part in this type of happy-go-lucky attitudes. The subsistence of the people is intimately bound with their system of land tenure. In theory, all land belonged to the king, not however in the sense of personal possession, but vested in him and administered for him by *Kazis*. Large areas of land were parcelled to these *Kazis*, who administered them with the help of *Mandals* (village headman). Revenue assessment was not on land, but on personal possession, number of persons and cattle. This repressive rent land pattern decreased agricultural production and ultimately led to many fallow fields. People were robbed of incentive to work. Amassing property was fruitless as it was the property that was taxed and not land. This type of land ownership gave rise to a subsistence economy. People were producing only as much as they needed. There was a limit of the accumulation of wealth by the common.

The rules of landownership and revenue have changed after assimilation with the Indian Union, but its effect still remains to be seen. At present, the rights of Lepcha landowners, in the land held by them, are heritable and transferable. The Lepchas pay land revenue and other local taxes to the Government following the prescribed land revenue rates.

Among Lepchas the class of landless tenants and landless labourers is small. Labour is needed at the time of cardamum harvesting or by the people who have more land and less family labour or people with more land at scattered locations, than the people in the family can handle. Other agricultural activities are completed with the help of family members and *Lobo* (mutual help) affiliations. Limbu, Rai, Tamang and Sherpa labour is common in the area. Labour is procured from Mangan, district headquarter. Passes from the district headquarter are obtained by employers for the required number of labourers.

A person can be a permanent labourer with his employee. He will go on annual leave and return to his employer. The required renovation of a working permit has to be obtained by the employer. The period of validity is for three months to one year. A pass can be renewed only four times. A new pass has to be obtained after the expiry of the stipulated period. The rates for labour employment are fixed by *Panchayat*, but the labourers do not want to work on payment alone, they want to rent land also. Legally other communities cannot own land in Dzongu, according to the act now in force any transfer of land or any right or interest in land in anyway whatsoever (including transfer by sale, lease, mortgage, inheritance etc.) is prohibited in respect of landowners. Though Dzongu is a Lepcha reserve only 56 per cent of total households are of Lepchas, the rest belong to temporary settlers of other communities. Lots of illegal leasing out of land has taken place in Dzongu, yet no reliable information could be gathered on this count. These tenancies are always verbal and no records are maintained. These labourers live either in field dwellings or in temporary houses. These Nepali labourers are very industrious and are able to save money which they usually loan it to their Lepcha employers who are spendthrift and always in need of money. They spend lavishly on rituals and ceremonies. When these loans are not returned, labourers get hold of Lepchas fields. Though highly illegal, it is common in Dzongu. The labour demand cardamum as security and interest. The cardamum was introduced in the area in order to improve the economic conditions of the Lepchas. It could not be predicted at that time that the entrance of money into the area was going to have disastrous consequences on illiterate people organised on egalitarian lines, which previously had no cash-economy.

Until very recently, it was possible to extend agricultural land by cultivating previously uncultivated land. The primary requisite was labour—it is a hard and time consuming work to clear and open new land for cultivation. The availability of land prevented the pressure on land

common to other parts of India. An expanding Lepcha agricultural family could usually, with effort, expand its holdings if desired. But ownership of land, however, is not sufficient in itself to ensure wealth. There must also be manpower to till the land. Here the land is plentiful and the labour is the limiting factor in production. The egalitarian society of the Lepchas of Dzongu might well be seen as the product of this situation. At this stage, the most precious capital is not land, but labour which cannot be passed from one generation to another. The Lepcha traditional system is no longer adequate and a more effective management is needed. Exploitation in the past, resulting from an indifferent attitude and ignorance, resulted in low productivity and soil erosion.

This effort is a critique of the theory, according to which resources become scarce because of population pressure. Studies in developing societies indicate the process of over territorialization, the increase in the volume of labour force, which puts an unanticipated pressure on land. The Lepcha situation is a contradiction to the above, where the problem is not of resources, but of their meaningful exploitation and management. Scarcity of labour renders vast tracts of land unexploited and virgin. For this, what is needed is a well-organised labour system, as resources are in plenty.

If labour is imported, the result of the consequence of large scale migration of labour on the socio-economic and political framework of the area would be tremendous. This can bring considerable demographic changes in this cardamum producing area, thus effecting ethnic composition of the Dzongu zone. Such demographic changes are economically significant in more than one way. Firstly, it led to continued imbalance between the fast growth of modern sector i.e. the cardamum plantation and the slower growth of traditional agricultural sector. This is mainly due to the fact that agricultural sector is forced with an acute shortage of labour. The result is that the cardamum producing region became deficit area in food grains. Secondly, though it is true that a part of savings by plan-

tation labourers is invested in agricultural development of the region when they acquired land on 'Adhia' basis. All the same, a part of savings in the form of wages is remitted outside the region and state either through postal facilities or in person when the migrant labourers return to their native places.

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