

THE RAJBANSHIS OF RAJGADH Community Adaptation in the Environment of Eastern Tarai

Hari P. Bhattarai

This essay tries to give a short description of the human/cultural ecology of the Rajbanshis, an indigenous people of eastern Tarai. It puts its stress on the various cultural strategies adopted by the Rajbanshis for their survival in their immediate ecological environment and is based on the assumption that human societies adapt to their natural environment through culturally structured activities. It explains the subsistential mode of land-use and social and natural resource utilization in the context of the changing environment with the primary focus on how the Rajbanshi are adopting various subsistence devices in order to maintain their social and cultural life.

People-environment interaction is a frequent subject matter of ecological studies in today's anthropology (Barth 1956; Vayda 1969; Rappaport 1979; Orlove : 1980 ; Hawley 1986) and adaptation is one central concept in such studies (Anderson 1972; Bhasin : 1988). The concept **adaptation**, refers to the process through which people make effective use of the energy potential of natural resources available in the area through their culturally structured activities (Bennet 1969; Haaland 1991). In its social aspects, adaptation is a process involving individual people who react to their social and physical environment according to their view of the situation and the knowledge of 'realities' they have to face (van Beek 1993). This body of knowledge is usually termed 'perceived environment' (Hardesty 1977) and is believed to act as an external mediating factor between change and cultural reaction. Population distribution, settlement patterns, socio-political organizations, domestic economic structure, kinship ties and exchange system, and utilization of different social and ecological niches are concrete examples of adaptive strategies to the environmental condition adopted by the people of different environments in different periods of time in order to survive (Barth 1964, 1967, 1969; Dahal 1983). However, my central argument in this paper will be that adaptation to the environment cannot be assessed without consideration of the degree to which particular land-use practices and other facets of lifestyle are ecologically sensitive and environmentally sustainable. The processes of adaptation should be analyzed by understanding the local environmental knowledge

available for land utilization and other natural resource management practices maintained by the people.

ANALYTICAL FRAMEWORK

The analytical angle in this paper will be cultural-ecological, in which a particular society is viewed from the perspective of its interaction with its physical as well as social environment. The concept of cultural ecology first proposed by Julian Steward in 1955 and the method of cultural ecology has been applied to the study of different human societies; for example, hunter/gatherer (Steward 1955), pre-industrial farmers (Geertz 1963; Netting 1968), pastoralists (Edgerton 1971, cited in Moran 1982), and contemporary rural societies (Stevens 1993), which primarily focus on the cultural strategies adopted by these societies in order to survive in the given environmental conditions³. The Stewardian style of cultural ecology tends to utilize a culturally defined human population as the unit of analysis to focus on the cultural rather than biological adaptations (Moran 1982). Although Steward regarded ecology as an important causal factor behind social institutions, he was clear that not all features of culture can be explained in terms of ecological adaptation (Gurung 1992). He was of the opinion that cultural ecology pays primary attention to those features whose empirical analysis shows them closely involved in the utilization of environment in culturally prescribed ways. He calls these features the 'cultural core' that includes exploitative technology, economic organization, population patterns, and sociopolitical system which are most closely related to subsistence activities and economic arrangements and suggests that only these core elements have adaptive significance (Steward 1955). It is clear that the concept 'cultural ecology' is primarily concerned with the search for cultural regularities and explanation of culture in environmental forms by understanding the relationship between technology and the environment. But in this paper, I shall try to explain how the environment itself is affected by certain cultural activities of the people paying attention to the possibility of environmental change and degradation occurring as a consequence of human activities and shall try to assess whether the non-core elements like language, religion, art, and values have any adaptive significance⁴.

If we conceptualize the Rajbanshi social system from the cultural-ecological perspective, the core elements consist of *hall kodal* (subsistence technology), population pattern, and *khetipati* (economic activities and subsistence) and the non-core elements consist of various kinds of their annual ritual cycles, *Lilas* and other values related to Hinduism, and their own types of art and cultures⁵. Thus,

here the theoretical focus of cultural ecology will be the interplay between environment and productive technology from the environmental side and the role of non-core elements in the adaptive processes of the Rajbanshis. That is, culture and environment are interdependent and have a dynamic relationship in which both culture and environment continue to adapt and readapt as each changes in response to the other's influence.

The cultural-ecological method adopted for this study postulates a relationship between environmental resources, subsistence technology, and the behavior required to apply technology for resource utilization. It demands examination of the interaction of societies and social institutions with one another and with the natural environment. The method of cultural ecology consists of three procedures: (1) analysis of the interrelationship between a subsistence system and its environment; (2) assessment of the behavior patterns associated with a given subsistence technology; and (3) ascertaining the extent to which the behavior patterns entailed in a given subsistence system affect other aspects of the culture.

ETHNO-ECOLOGICAL VIEW OF COMMUNITY HISTORY

A study of the course of adaptation and its fluctuations and changes has to focus on both the internal organization of the group and the specific characteristics of the environment where the people live. This has to be done in a historical framework because the essence of adaptation is related to the changing relationships of people and the social and physical environment (van Beek 1993). Of course, since the historical sources on Tarai people are few, one has to rely on the oral tradition, climatic data over several centuries, the political history of Tarai, and the official records of both the British East India Company and the Nepalese government. In this context Gaige (1975) writes:

It appears that nearly all the settlers in early Tarai history were of Aryan or pre-Aryan indigenous stock. The ancient and medieval history of the region is a cyclical one in which men and forest have dominated in turns. From time to time, people from more settled part of the Gangetic plain pushed back the forest, cleared the land, and established settlements that grew into kingdoms. When the kingdoms withered away because of natural calamities or war, the forest reclaimed the land.

However, from the beginning of the seventeenth century, the dense Tarai forestland was continually cleared and settled by tribal people more permanently. According to Hamilton (1819), the majority of the inhabitants of eastern Tarai were plain tribals. Tharus were spread throughout the whole region and the Rajbanshis, Meches, and Gangais inhabited the far eastern Tarai.

The Rajbanshis - one of the groups of the great Bodo/Boro or Bara family - entered India in the 10th century B.C. from the east and settled on the banks of the Brahmaputra and gradually spread over Assam and the whole North and East Bengal and East Nepal (Sanyal 1965; Gautam 1994). They have often been referred to as *Koch* or *Coche* (regarded as their historical and original name) who were a very powerful nation during the 17th and 18th centuries. About that time, however, they were absorbed by the British in India and Jhapa and Morang, their territories, were annexed to the kingdom of Nepal by king Prithvi Narayan in 1774 (Bista 1972). In this context, Berlic (1985) writes:

We do not know very much about their ancient time. The Barae people (for us, Bara means Bodo and not Bhar), inhabitants of the areas of the actual State of Manipur (India) could be the Bodos. At the end of the middle age, a group of this big ethnolinguistic family, the Koch, occupied (India). They had conquered a part of the ancient Thai-Ahom kingdom (which once included the western half of the Assam on one side and the eastern half of the Morang on other, with all the intervening country (Hodgson 1878, cited in Bista 1972). It is only in the 16th century that these new Masters of the region took the name of the Rajbanshi.

In Nepal the Rajbanshis stand for the relatively large and dominant groups of people living in the eastern part of the country - namely Jhapa and Morang districts. In their physiognomy and racial traits they could be classified anthropologically as Mongoloid (Sanyal 1965; Berlic 1986) and are more closely related to Tharus, Satars, and Danuwars than to any other people living in the areas. But unlike the Tharus and Danuwars, who are widely distributed in the plains, the Rajbanshis are found mainly in the area between the Koshi and Mechi rivers in Nepal and further east and south across the Indian border (Bista 1972).

During the seventeenth and eighteenth centuries most of the Tarai tribal people including the Rajbanshis practiced *slash-and-burn* cultivation, shifting their location every three or four years when the land lost its fertility. Although the land remained fallow for a long time, it was not reclaimed by the forest because of continual grazing by the herds of cows and buffaloes driven north from India during the dry season by Ahirs and other caste Hindus (Gaige 1975). In the twentieth century, the intervention of technology controlled malaria and turned the Tarai into a new frontier for human occupancy⁶. This resulted in a major shift of the population from the Hills to Tarai with far reaching consequences in population distribution and land-use change⁷. The pattern of change followed closely that which took place in other parts of the Gangetic plain. That is, the *slash-and-burn* cultivation was replaced by intensive farming and nomadism was

replaced by permanent settlement in response to the changing context of ecology and demographic structure of the Tarai.

Thus, the rapid growth of population, increasing rate of internal and external migration, competition for limited resources (land and forest), and different government policies to use and allocate these resources have affected every aspect of these people. Natural resources, particularly forests and grazing lands, have been decreasing and deteriorating in the area resulting into unintended and unanticipated environmental consequences. The increasing rate of resource deterioration has threatened not only the environmental balance and conservation of natural species, but also the basic needs of subsistence of the vast majority of the population, including the Rajbanshis living in the area.

If we conceptualize the distribution of cultural sub-traditions within a population as different streams, the Rajbanshis thus participate in many such streams which are also shared by the members of other groups. There are, however, some typical socio-cultural features or traditions which both Rajbanshis and others recognize as exclusively Rajbanshi. For instance, one can cite the consumption of meat in the course of performance of death rituals, performance, the system of taking bride price in marriage, the worship of their village deities, absence of the concept of menstruation as a pollutive process, abandonment of the sacred thread, and their typical dress and settlement patterns (Bhattarai 1994).

STUDY AREA AND POPULATION

The Rajbanshis, the focus of this study, inhabit Rajgadh village of the Rajgadh VDC of Jhapa district (26° 20" - 26° 30" North; 87° 45" - 87° 00" East). It comprises a narrow strip of alluvial plain with a very low altitude of about 100 feet from the sea level. It has a sub-tropical climate with a good deal of humidity in its atmosphere which is hot in summer and moderately cold in winter. Rajgadh receives approximately 234 mm of rainfall annually (CBS 1991). The total study population comprised 335 individuals (171 males, 164 females in a total of 59 households). The sex and dependency ratios were 104 and 0.87 respectively. The household size of the village ranged from two to fourteen with an average of 5.67 persons per household. More than half of the study population (52%) stated that they could not read and write (i.e., were illiterate). Only one percent of the population has the education of S.L.C. equivalent and more.

SOCIAL ECOLOGY

The village is heterogenous in term of its ethnic composition. The major caste/ethnic groups of the area are Brahman/Chhetri, Rajbanshi,

Satar, hill Matwalis (Magar, Rai, Newar), Saha, Kalwar, Malaha (Fishermen), Thakur (Barber), Ganesh, Muslim, and occupational castes such as Kami, Damai. Among these groups, Rajbanshi, Satar, and Ganesh are indigenous inhabitants whereas most of the Brahman/Chhetri, hill Matwalis, and occupational castes are hill migrants who arrived in different phases of time during the last fifty years. The other remaining groups like Saha, Kalwar, Malaha, Thakur, and Muslim are of Indian origin who were invited to settle in the area during the Rana Regime to maximize agricultural production and to increase land revenue in the Tarai.

The Rajbanshis are mostly agricultural people. Therefore, in most of the cases their villages are found in an open space in the middle of their farms. Occasionally, they also build a village for a group of persons with their cultivated land elsewhere because they prefer to live with their community. In every village, there is a relatively rich and big landowner who is known as *Deoniya*. He acts as the chief of the village. Thus, a Rajbanshi village consists of a comparatively bigger house of *Deoniya* (landlord) and a group of smaller houses of his sharecroppers and other landless people who work as wage laborers for him. There is thus no well defined village boundary under such condition and the boundaries are not marked out with fencing or pillars. However, the villagers know the boundary of their village which often consists of an imaginary line along some big tree or big earthen embankment on the cultivated land known as *dhur*.

The basic residential, social, religious, and economic unit of the Rajbanshis of Rajgadh is the patrilineal nuclear family. This unit consists of a man, his wife, and their unmarried children, usually occupying a single dwelling. In some cases, a household may consist of two or more married males, their wives, and unmarried children, all working on the same undivided land. Such households are termed here as joint families, which may split into two or more residential units, regularly occupying outbuildings, away from the main house. In joint families, however, the basic economic unit is not a residential unit. All the individuals share in the family occupation and eat from the same hearth in joint families.

In most cases, the head of the family is the eldest active male of the household. He bears the final responsibility and is the sole authority for the family's well-being and everyone is supposed to work and act according to his direction. The wife of the eldest male, regardless of whether the latter is living, is the head of household chores and of all the females, particularly in the joint family. The practice of patrilocality in the Rajbanshi community can be seen from the fact that after the death of the household head, the responsibility and authority are both transferred naturally to the eldest son, but the eldest woman of the household becomes the titular head of the household upon her husband's death, if there are no younger sons or brothers to take over.

The Rajbanshis of this village prefer to live in nuclear families than in extended or joint families due to inadequate land-holding and poor fertility of the soil. About 81% of the total 59 Rajbanshi households belong to the nuclear families. It seems that their family types are more or less influenced by the size of land-holding and other resources available for subsistence. The rules of inheritance are on the 'principle of ownership by birth' and the exercise of inheritance rights by the Rajbanshi always proceeds through stages. A separation from the main household usually occurs as brothers divide their father's property and the final division of the property usually occurs after all the sons of a man have got married and have established separate households. In most cases, however, the process gets delayed until after their father's death.

SOCIOCULTURAL PRACTICES AND ADAPTATION

There are two main ways of relating socio-cultural systems (rituals, festivals, etc.) to the environmental phenomena: either showing that items of the socio-cultural system function as a part of the whole system that also includes the local ecological phenomena or else showing that the environmental phenomena are responsible in some manner for the origin or development of the socio-cultural system under investigation (Vayda 1969). The festivals and rituals which the Rajbanshis have been celebrating are associated with one or the other of the Hindu pantheon. The Hindu concept of sacredness (e.g., sacred cow, trees, and plants) is one of the sustainable or beneficial relationships that have evolved in the course of the interaction of human population with the natural environment over time (Harris: 1974). Both of these ways are applicable in the study of the socio-cultural system of the Rajbanshis. For example, the tradition of conspicuous consumption and expenses in their *rite de passage* evolved from their dominant position in the arenas of resource use and allocation in the past. These customs were functional in the past, when there were enough resources for consumption or distribution for continuing the production in the succeeding years. Thus, the environmental attributes (high soil fertility, abundance of natural vegetation) are responsible in the origin of the customs of conspicuous consumption in marriages and death rituals among these Rajbanshis of Nepal Tarai. On the other hand, these rituals and festivals like *Maghesagaranti*⁸ and performance of various *Lilas*⁹ function as the part of the ecosystem that help to maintain the local ecosystem by consuming the excess or surplus production in the appropriate season. *Maghesagaranti* is celebrated in the middle of January (a cold season in the area) and is believed to be the best period for meat consumption in that hot climatic area. The *Lilas* also act as

recreational institutions for the Rajbanshis, as there are no other entertainments in a concrete sense.

Likewise, festivals such as *Aashari Ghasari*, *Kadsiruwa*, and *Rangsiruwa* are more or less related to the environmental potentiality of the area. *Aashari Ghasari* is celebrated in the month of Ashadh (July). Rajbanshis worship the forest as god *Indra* (king of the heaven and god of rain) to get good rain all over the year on this occasion. Since all the lands of the area are rainfed, this festival reflects the role of forests in rain which is an inherent part of their life. Both *Rangsiruwa* and *Kadsiruwa* are related to the land, the only permanent source of livelihood for the Rajbanshis. These festivals are celebrated on the second and third days of Baisakh (the third week of April) respectively. All the Rajbanshis of a village collectively worship land for its sustainable fertility: their mud-play signifies the value of soil and land in their survival. Thus, the socio-cultural features of the Rajbanshis in some respect are the product of the local environmental phenomena. But, at the same time, they also act as a part of the local ecosystems.

TECHNOLOGY

Every human society employs techniques in order to appropriate resources from the environment. Each technique is a combination of material artifacts (tools and machines) and the knowledge required to make and use them. Thus, the technology of a human group is the total system of means of production by which the group interacts with its environment. This includes the use of tools, the pattern of works, the information of the knowledge employed, and the organization of resource for productive activities. The numbers and kinds of tools a society uses are related to the cultural practices and life-styles of its members. The material culture of the Rajbanshis, which is reflected in their productive technology and the means by which they have been exploiting the resources around them appear simple. They fulfill their subsistence as the natural environment permits them with their simple technological knowledge of irrigation, ploughing, and transportation. As they are agriculturists of the plain region, they have been using their traditional simple technology in order to survive in that environment because it has been comparatively productive until now. Since technology and environment form a single system together, if one changes, ultimately the other one also is effected. Due to population growth, migration, immigration, and forest depletion, the soil fertility of the area has changed, and to manage this change, these people have also changed their technology of subsistence. For example, they have adopted a culture of cultivation of cash crops

including the technology of groundwater irrigation, and improved varieties of crops in spite of the cultivation of cereal crops of local varieties, depending on the monsoon. However, changes in the traditional mode of subsistence are not significant as in other areas and as among other people such as the hill folk.

Agriculture is the main subsistence of the Rajbanshis, which is exclusively based on human and livestock power but they sometimes also use the rice and flour mills located in the village. Agriculture, as a result, is labor-intensive for those crops harvested in winter such as tobacco and wheat. Almost all of the Rajbanshis rarely use chemical fertilizers but use frequently both manure and animal dung. The shortage of firewood due to deforestation and other constraints posed by the forest guards have induced them to use cattle-dung as a cooking material which is a convenient form of energy for the rural women due to its long lasting heat giving capacity. On the other hand, use of animal dung as firewood has also a certain negative impact upon farm production since alternative sources for fertilizing the field are lacking. Usually the Rajbanshis use the following implements for their agricultural activities:

1. *Hal* - plough
2. *Kodal* - spade/ho
3. *Kurali* - axe for splitting wood
4. *Kachiya* - sickle for harvesting
5. *Hasuwa* - sickle for jute plant
6. *Dao* - chopper for cutting wood
7. *Bossila* - smaller axe for cutting and splitting wood/bamboo
8. *Dhangni* - club to break the clods after ploughing
9. *Moai* - harrow
10. *Passimi* - spud

The use of these agricultural implements shows that they depend heavily on human and animal labor rather than machine for cultivation. Their *hal* is similar to those used in other regions of Nepal – a wooden structure with a wooden moldboard and iron share and hook, pulled by oxen or buffaloes. The plough is connected to the yoke with the help of *jotar* (jute string). As the use of the plough is the main characteristic of subsistence agriculture, it is an important tool for tilling agricultural land. The digging spade – *kodal* – is used mostly in making terraces during the rainy season to hold back water for transplanting paddy and is another prime agricultural implement. However, the other tools like club, Jadder, spud (specially used for weeding kitchen garden, and jute and tobacco plantations), and sickles are also used frequently. Implements which are used for extraction of forest materials such as firewood, or are used as housing materials, such as ploughing wood etc., are axes for splitting wood; small axes

and chisels, specially used for making wooden agricultural implements like plough; and the chopper used for cutting bamboo and fence-making and other purposes. These tools have been used by these people for generations. No changes are yet evident in the size and shape of these tools, except the plough. Some Rajbanshi households have been using an improved form of plough made from iron plates provided by the local cooperatives and the Agricultural Development Project.

These people depend heavily on the monsoon for irrigation because there are no irrigation facilities. They simply raise *aali* (embankment) around the small plots of land called *khutti* with the help of *kodal* to preserve water and prevent soil erosion.

Their only means of transportation is the Bullock Cart, drawn by bullocks and sometimes by male buffaloes. It can go over the unmetalled roads, muddy fields, and over small embankments of about two feet height. It is generally used to fetch corn and hay from the fields, firewood from the forest, merchandise from the market, and even people. It is usually made of wood, bamboo pole, iron sheets, and has an axle.

They have been using spinning and weaving implements to make jute strings from jute fiber for use in household articles, partly for their own consumption and partly for sale. Such articles are *dhokra* (a jute cloth used as bedsheet), *sutli* (jute thread for tying the parts of the hut), and *rassi* (rope to keep the cattle tied in cowsheds).

They also make fishing nets and traps from bamboo and dry jute plants which they use for fishing in their paddy fields during the rainy season after the paddy is planted when they have time away from the farm. The small fish, thus collected, Sun-dried and preserved in a bamboo pot, are called *sidol* (dry fish), which make a prestigious and tasty curry.

ECONOMY AND SUBSISTENCE

As in most Nepali villages, the main source of livelihood among the Rajbanshis is agriculture supplemented locally by animal husbandry, small scale trade, and wage labor. The pattern of landownership extant today in Rajgadth dates from the dawn of the Rana rule; may be, even earlier, when the practice of allotting land to the household for cultivation was perhaps established. State ownership was the traditional form of land tenure, called *raikar*. In the absence of private property rights on the *raikar* land, the cultivator could enjoy only the rights to cultivate the land and enjoy its produce subject to the payment of the rent to the state. Although, state land had been registered in favor of the cultivators before the first quarter of the 20th

century ended, a large disparity remained in land-holding size even after the Land Reform Program of 1964 Land Act prohibited landowners from appropriating in excess of half of the annual yield of the land. Also, the cultivator who acquires tenancy rights cannot be evicted by the landlord except through a judicial decree. But in practice, these provisions are not effectively implemented.

Dhanhar (paddy land) and *bhith* (dry land) are the main land types of the study village as classified on the basis of irrigation facilities, soil types, and types of crops cultivated. It has a total of 235.15 ha of cultivable land, out of which 194.91 ha is *dhanhar* land (82.88% of the total cultivable land). Likewise, there is 40.91 ha of *bhith* land (17.11% of the total land under cultivation). The land-man ratio and land-household ratio in the study village are 0.15 ha per person and 0.88 ha per household respectively. *Adhyan* (sharecropping) and *thekka* (fixed rent) are two ways of land renting in this village. Mortgaging of land was also reported in significant numbers (five cases, or 8.4% of the 59 households) in the study area which is locally known as *Biaj Marauni*.

The *Brahman/Chhetri* group has the largest amount of land-holding per household compared to other ethnic groups in the study area. Out of the total cultivated land 235.15 ha, more than 50%, i.e., 118 ha is owned by the Brahmans/Chhetris. Rajbanshis who had owned about 74% of the total 212.15 ha cultivated land in 1964-65 owned only 41.15% (96.78 ha) in 1992-93. Their caste status and literacy skills enabled them to take advantage of the administrative regulations on land acquisition. In addition, the heavy expenses on life cycle ceremonies and social occasions⁸ of the Rajbanshis forced them to sell their lands to the hill immigrants because very few of them (about 5% of the total 59 households) could fulfill their social and cultural obligations (including ceremonial expenses) with their farm surplus and savings. All others (95% of the total households) have to sell land (54.24%) or mortgage (8.47%) and take loan (32.24%) from the local moneylender (usually hill Brahman) to meet their social requirements. As the size of land-holding ranges from 0.002 ha to 30.6 ha per household, majority of the Rajbanshis are now engaged in agriculture either as marginal landholders or as tenants and sharecroppers of the big landholders (Rajbanshis or Brahmans/Chhetries).

As land and family size is not distributed equally among the households in the study area, the degree to which each household produces its own food varies considerably. It generally depends on the quality and quantity of the land processed by the household and the number of members in the family. Although the average land-holding

of the sampled households is 1.08 ha, more than 50% of the households produce grain to meet only three months' requirements. Thus, diversification and intensification of crops and exploitation of local resources (wage/*dini* labor, firewood selling) to earn cash are the main strategies adopted by the Rajbanshis to manage population growth, land scarcity, and social and cultural needs.

As in other rural areas of Nepal, the farming practice of the study area is characterized by mixed farming, which includes agriculture, animal husbandry, and horticulture. Agricultural activities are characterized by simple traditional techniques where manual labor and animal power are used for ploughing, sowing, weeding, harvesting, and threshing. Changes in demographic structure through natural growth, migration, and immigration, and its resultant pressure on the agricultural sector have altered the cropping patterns of the study area. In the past, when land was in abundance and population size was relatively small, people used to grow only one crop of paddy which was transplanted (in most cases, seed broadcasting was the rule in over two-thirds of the paddy land) in July/August to be harvested in November. For the remaining months of year, land was kept fallow when large flocks of cattle and buffaloes grazed there. This fallow period provided sufficient time for regeneration of the natural soil nutrient, on the one hand, and absorption of the excreta of cattle and buffaloes on the field soil, on the other. It had a positive effect upon land productivity. Some of the large land-holding Rajbanshis here still follow such mode of cropping because they own enough land.

In the course of time, as population increased, there was fragmentation of land and single cropping could not meet the increased demand for food and other requirements. As efforts were made to intensify the farming practices to adjust to the changing social and natural environment, winter crops were introduced along with improvement in the irrigation system. With the arrival of the hill people, maize and millet were also introduced around the 50s. The fallow period of land between two crops has shortened and the frequency of crop rotation in the same land in a year has increased. In addition to paddy, Rajbanshis have started to grow maize, wheat, millet, and summer paddy (where irrigation is possible in winter). Gradually, subsistence farming is being monetized. Various cash crops such as tobacco, jute, vegetables like chilies, tomatoes, and potatoes have been cultivated for their own consumption and partly for sale which are recent developments in the local economy. Weekly market facilities can fetch cash from these products. Such a situation induced Boserup (1965) to forward the hypothesis that "As population grows and land-holding becomes insufficient, agricultural practices tend to

become intensified", which is primarily based on the *Law of Least Effort*. This law holds that cultivators do not normally intensify or adopt technological innovation for intensive agriculture except when forced by the pressure of population on resource. The general patterns of intensification include increasing amounts of land being brought under cultivation, a shortening of fallow periods leading up to multi-cropping, a shift from dry to irrigated agriculture, change from natural grazing to producing fodder, and increasing inputs of time into agriculture on the part of the community. However, as the area is flat and fertile which makes transportation easy and market facilities available, it is profitable to exchange agri-production into cash. This provides income throughout the year to fulfill recurrent and contingent expenditure of the Rajbanshis irrespective of population pressure and land scarcity. This means that environmental condition may be as important as population pressure and land scarcity in determining the cropping intensity of a particular geographical area.

Work on the farm is done by the members of the family. Excluding the children below five years, the old, and physically disabled members of the household, all participate in economic production. In many cases, they may handle all the activities - ploughing; harrowing; breaking clods; weeding maize; and transplanting tobacco, millet, and paddy seedlings. Some well-to-do households maintain keep attendants for domestic service and farm work. Generally, these attendants are poor Rajbanshis, who often prefer to live in the Rajbanshi households because their food habits resemble. There is often a pre-arranged contract between the employer and the labor hand. The relatively better-off households occasionally grant loan to labor households during critical periods and supply them food grains when food shortage occurs on the understanding that the latter would work as labor hands during the peak farming seasons. Basically this type of relationship exists between landlord and sharecroppers living on the free land of the former. Hiring of labors on daily/monthly wages for ploughing, transplanting, weeding, and harvesting is also in practice. Transplantation of paddy is usually carried out by women labors called *Ropahar*. However, the use of labor is affected by a variety of factors such as quality of soil, irrigation facilities, types of crops grown, size of holding, ability of farming and availability of other types of labor, distance of the land-holdings from the homesteads, and the span of peak season for farm operation.

As farming gets more intensified and diversified, there is greater demand for labor. The labor of family members alone often cannot meet the demand. The Rajbanshis along with other ethnic groups of

Tarai have developed *hauli* as an indigenous system of labor exchange for the peak agricultural season and *dini*, which is concerned with remuneration for the labor concerned in kind, is also in practice. *Hauli* is used mainly during transplantation of tobacco and preparation of *fari* (process of making bundles of tobacco leaf when the leaf is separated from stem). *Hauli* is not like 'exchange labor' in the sense that it is not necessarily reciprocal. The household which hosts *hauli* has to provide food with meat and other varieties of curry and *muri* (poprice) or *chura* (bitten rice) to the person at work. This system is not only economically important (the hosts can thus save quite a large expenditure). It can also preserve social integration. Since anyone can be called for work, irrespective of his wealth and social prestige, it helps to maintain emotional interdependence in the Rajbanshi society. However, women are not usually allowed to go for *hauli*, nor is there any rule that the head of the family must go for it. The well-off households send other persons to work for them and pay them in cash/ kind. Defaulting brings social ostracism. Such practice plays a significant role in strengthening the Rajbanshi economy. They not only fulfill their daily labor demands, but also save good amounts of cash. In *dini*, a group of laborers is hired for harvesting, threshing, and winnowing of paddy and wheat, even in extracting jute fibers. Generally, the laborers receive 1/8th of the total production of their work from the landowner.

The agricultural calendar begins in March/April and ends in November covering about nine months. Paddy, maize, wheat, millet, oilseeds, and lentils are the major crops grown. Jute and tobacco are extensively grown as cash crops. Green vegetables are grown partly for consumption and partly for sale. Usually, cereal grains satisfy the subsistence needs of the Rajbanshis, whereas the cash crops provide an extra income to fulfill other household requirements. Since all of these are labor-intensive crops, their level of production can be raised by increasing labor inputs. However, today, there is little land for continued expansion and labor input in the area is already so high (Mishra, Uprety, and Pandey 1992) that labor intensification alone can raise production only minimally. There is intensive demand for labor only at certain times of the year, i.e., during the peak agricultural season. Consequently, a large part of the labor force must find employment elsewhere or it has to be employed during the slack agricultural seasons in other sectors. Such free time (off - farm period) is used to exploit what Yengoyen (1975) has referred to as 'micro-economic niches' (cited from Pofferberger 1976) such as small trade, seasonal migration, cottage industry, collection and selling of firewood and timber, in order to supplement the household income.

Many Rajbanshis have started to exploit the microeconomic niches available in the area and other places up to Kathmandu, and are now reaching as far as the Indian states of Punjab, Hariyana, and Delhi.

It was also observed that land use for growing crops is more or less determined by socio-religious and cultural practices, although the combination of crops is varied depending on the local soil condition and available irrigation facilities. One can easily observe that farmers here have extended agricultural land as much as possible to respond to the growing population pressures. Different types of crops are grown in the same field (mixed cropping) to overcome the shortage of cultivable land. The choice of crop to be cultivated is determined by their habits and cultural values. The Rajbanshis thus manage to grow two or more crops in the same land at the same time. Mixed cropping helps to maintain the fertility of soil through utilization of different proportions of soil nutrients. Some leguminous plants provide extra nitrogen to the soil and can be utilized by another crop, which is mixed with legume. Hence, their knowledge of mixed cropping not only helps to understand their realization of the given ecological constraints but also helps them in many other ways to survive despite land scarcity. The major patterns of mixed cropping practiced by the Rajbanshis are:

- Paddy + *Khesari* + Pulses and Soybean (on the levees of paddy land)
- Maize + Cucumber + Pumpkin + Beans
- Mustard + *Musuri* (*Lens culinaris*) + Radish
- Potato + Green vegetables

The difference in consumption and economic status of the Rajbanshi households has also influenced cropping patterns in the study area. Acute need often leads the poor Rajbanshi peasants to sell their best expensive crops. These peasants consume crops that are in lesser demand in the market. This explains the reason for selecting crops for the family farm. The subsistence farmers primarily need cereal food for their survival, whereas the affluent farmers with surplus production prefer to grow better grain species for their consumption and get better price from their sale. However, even this trend has been changing recently. Three households out of fifty-nine cultivated tobacco and green vegetables which fetch more profit than other cereal crops (cereal grains can be easily bought by the profit money obtained from the sale of cash crop). Farmers often invest their extra time also in small business and kitchen gardening to gain more cash.

Rajbanshis also keep parts of their farmland fallow, leaving domestic animals in the fallow fields, grazing them on harvested

fields, and applying manure and compost obtained from grasses, forest leaves, and residue of previous crops to maintain soil fertility. Sometimes they use chemical fertilizers (mostly nitrogenous), which the average subsistence farmers cannot afford. Hence the traditional use of dung manure supplemented with compost made from dry weeds, forest leaves, and crop residue predominates. Although the combination of crops varies depending on the local soil condition and irrigation facilities, the general cropping pattern is changing from extensive to an intensive one. The general cropping pattern remains as follows:

Land Type	Fallowing Pattern and Period	Evaluation
A. Dhanahar Land	1. Paddy -- (7 months) - Fallow 2. Paddy - (2-3 months)- Maize/ Oil Seed/Jute/Vegetables 3. Paddy - Wheat - Paddy	Extensive Semi-Extensive Intensive
B. Bhith Land	1. Tobacco - (8 months)- Fallow 2. Jute/Maze - (3-4 months) - Mustard Oil Seed	Extensive Semi - Extensive

Animal husbandry is an integral part of the rural agricultural system. In addition to manure, draft service, and dairy products, domestic animals contribute additional income. Cattle and buffaloes are kept as a source of draft power, milking, and farm. The males are used for drafting carts and ploughing and females for milk. Rajbanshis keep cows, oxen, buffaloes, male buffaloes, and goats. Some households provide animals to other households without transferring ownership to be kept in *Adhiyan* system (lambs are equally distributed between the owner and the caretaker). Ducks and pigeons are also reared. As the domestic animals play an important role in the socio-economic and religious life of the community, they reflect the status of the owner in the society. Since Rajbanshis claim Chhetri's status in the caste hierarchy, they do not domesticate pigs and chickens following the custom of high caste Hindus and consume goat meat, not pork and chicken.

Apart from the additional income that the sale of these animals and their products (milk, ghee, curd, and meat) fetches, there is also manure that helps in maintaining soil fertility. As chemical fertilizers are costly and sometimes not available in time, manure is of great importance in the local farming system. Altogether, 321 animals were raised by the sample Rajbanshi households - 90 cows, 28 buffaloes, 73 oxen, and 130 goats. On the average, one cattle produces about 2 kg of dung per day whereas buffalo brings 3 kg and goat about 100 gram. Thus annually, 163 cattle produce 118,990 kg of dung, 28 buffaloes bring 30,660 kg, and 130 goats 4745 kg which altogether is 154,395 kg for the 59 sample Rajbanshi households. The average

amount of compost available per household is 2617 kg which can contribute to increase soil fertility without spending hard cash for chemical fertilizers. The uneven distribution of animals and differences in their types, however, render compost production per household unequal. Animal husbandry in the study area is thus directly related to its agro-economy. As subsistence agriculture is a dominant part of its economy, animal husbandry provides not only manure but also the basic foodstuff. Due to the fragmentation of holdings and lack of grazing lands, however, the number of domesticated animals is decreasing.

Rajbanshis also practice a system of renting animals locally called *Pana*. The household which hires the animal (oxen/buffaloes) and annually pays 12-15 mounds of paddy to the owner of the animal uses it for ploughing or draft purposes. He is also responsible for its caring and rearing. Generally, the landlords who hire out oxen to their sharecoppers get their rent during the period of paddy harvesting.

Since animal husbandry is an integral part of the agriculture system of Rajbanshis, the number of livestock and agricultural productivity depend upon the availability of forest resources. A close relationship thus persists between the forests, rainfall, and agricultural productivity as much of the land in the study area is rainfed. Forests play an important role in sustaining land productivity by providing dung manure supported with bedding materials from the forest which also provides grass and fodder. Thus, agricultural production, the principle source of livelihood of the Rajbanshis, is directly related to the quality and quantity of wild vegetation. If the forest cover decreases, fewer animals can be raised. Consequently, smaller amounts of manure will be produced. Crop yield will decline and shortfalls in production will mean grain deficit. Forest resources thus play a key role in sustaining village economy by directly or indirectly contributing to agricultural production.

Although agriculture is the backbone of Rajbanshi economy, income from farm alone is not enough to maintain the households because many households have inadequate land-holding. Moreover, population increase means food deficits and additional expenses. People have to buy clothes, iron implements, salt, cooking oil, soap, tobacco, kerosene, and spices, which call for income beyond what their land brings. They thus engage themselves in off-farm or subsidiary economic activities: wage labor, firewood/timber collection and selling, small trade and business, services, and seasonal migration. Off-farm activities thus provide alternative opportunities to generate cash which also helps to raise the social status of a household by providing means for spending in different social sectors. Hence, the

overall production system of the local Rajbanshis is clearly domestic or peasant in nature and their economy supports Firth's definition of peasant economies "...a system of small-scale producer, with simple technology and equipment often relying primarily for their subsistence on what they themselves produced such a small scale productive organization, built upon the use of close relation with primary resources has its own concomitant system of capital accumulation and indebtedness, marketing and distribution" (cited in Dahal: 1983).

FARM ECOSYSTEM AND ECO-CULTURAL-RELATIONS

The vast majority of the people living in the study area depend on agriculture for their livelihood, which itself is heavily dependent on forestry for its sustenance. But the farm ecosystem is relatively self-contained and provides most of the needs of the farm family for food and shelter. The family farm management system in the study area can be deemed as a complex arrangement of soil, water sources, natural vegetation, crops, livestock, labor arrangement, and other cultural and social resources that a farm household manages in its production.

In the past, the interaction and balance developed by the local farmer between crop production, livestock raising, and forestry allowed sufficient levels of agricultural production. More recently, however, rapid population growth and fragmentation of land-holdings throughout the region have brought increased competition for scarce resources disturbing the ecological balance. As a result, yields are declining, a consequence of declining land fertility due to lower nutrient flow through the forests. Consequently, people have changed their cultural practices, adopting new technologies for the improved varieties of crops, and new consumption patterns. Again, intensification of agriculture is another example of change in the local cultural practices by means of which the people have responded to the decline in crop yield.

The existing relationship between crops, human population, livestock, and forest shows the cultural-ecological relationship in the study area. It can help one to see how the local ecosystem is maintained or disturbed by the prevailing socio-cultural practices of the people. The entire environment of the village can be divided into three main ecological components: (1) physical or abiotic component which includes heat, water, land, and climatic conditions; (2) biotic component which includes all the living organisms such as plants including crops and wild vegetation and human population; and (3) cultural component which includes knowledge, value and belief

system about cropping patterns, choice of crop cultivation and animal raising, people's consumption patterns, and the technologies used by them to extract resources from the environment. The ecosystem or ecological system of the study area then becomes a relatively stable set of organic relationship between the livestock, forest, crops, and human population in which energy, material, and information are in continuous circulation and where all these components can be seen in terms of their systemwise repercussions. The Rajbanshis of the study area can thus be understood as a population not only in terms of their social organization but as an integral part of the ecosystem with a common set of distinctive features by which they maintain a common set of trophic (energy) relationship within the ecosystem which they occupy. This also means the Rajbanshis are to be identified distinctly from other population in the study area in terms of the position of the 'niche' which they occupy in the total ecosystem.

All the livestock including cattle and water buffaloes are key links in the village ecosystem as providers of manure which when composted with wild vegetation and agri-residue is used to fertilize the fields. The male cattle and buffaloes are necessary for ploughing the field and females are used for production of milk and offspring. They can also produce significant amounts of manure. Livestock provide meat, milk, and other dairy products for the human population and the human population maintains livestock by investing labor, capital, and time. Human population and livestock are thus in a symbiotic relationship in terms of population interaction. Human population, again, invests capital, labor, and time for cultivating and harvesting crops, which provides them food grain for meal and cash for various kinds of expenditure. This is an example of a symbiotic relationship among the human and cultivated plant species. In this way, energy, material and information in continuous circulation maintain a stable set of organic relationship between the livestock, forest, crops, and human population up to a certain energy level. If one element of the ecosystem extracts more energy without recycling, then the ecological balance gets disturbed causing severe side effects.

Forests have always been an inseparable part of the subsistence activities of the people which not only provide fuelwood, timber, herbs, and grazing lands for livestock but also help to protect them from natural calamities such as soil erosion, landslides, and floods (Bajracharya: 1983). Forests in addition provide timber and poles for housing, livestock sheds, furniture for households as well as farm implements and tools for the local people. The local people use the forest products such as birds, fish, wild animals, fruits, and honey for direct domestic consumption, and bamboo shoots, mushrooms, certain

kinds of herbs, and honey are significant sources of food and income from the forest. The forest thus becomes a renewable source of production of goods and services and is an inherent part of the human environment, as well as a medium for recycling energy and waste products.

This same resource (forest) is becoming scarce day by day, a scarcity reflected locally in the number of houses needed to collect loads of firewood. In this context, many Rajbanshis reported that whereas a few decades ago it took only one hour to collect one *bhar* (a load that an ordinary man can carry) of firewood, now it takes about 4-5 hours. On an average, one household requires one *bhar* of firewood a day; their consumption is relatively higher than among the hill folk in the area. The high consumption is mainly due to the large and deep ovens in local use and the production of hulled rice which needs large amounts of firewood. It was also observed that a significant amount of timber was being smuggled by many local people to get cash causing massive deforestation in the area which adversely affects the local ecological balance.

The decrease in livestock raising due to fodder and grazing scarcity has a negative impact on subsistence farmers of the area. The question of fodder and grazing shortage in the forest is crucial because in the absence of fodder and grazing land fertilizers cannot be produced, and without sufficient fertilizer the production level inevitably declines, which ultimately disturbs the people's subsistence patterns. The environment then becomes more hazardous to exploit. Thus, it seems essential that some system be developed to re-establish and maintain the balance between man and his environment.

Although, there were no institutional and social/cultural mechanisms to control and maintain the natural resources such as the forest land developed by these people similar to the *Kipat* system of the Rai and Limbus and *Shingo Nawa* of the Sherpas in the Hills and Mountain respectively (Fisher 1990, Shrestha *et al* 1991), they have recognized the need of a social mechanism to control and maintain man's relation with the environment in the form of collective *pooja*. They worship green trees as deities and perform *poojas* before entering the forest to collect timber and firewood. They never cut and fell down the green trees unless there is a sharp need. Usually they fulfil their timber needs with dead and dried trees. Branches are used as firewood material. But this tradition of resource control has disappeared gradually because of population pressure and the state policy toward the forest resources (Bajracharya 1983). Before 1951, the state also encouraged villagers to reclaim the forest land in order to maximize state revenue (Regmi 1978).

As the human population depends heavily upon the wild vegetation of forest land (see Rai 1985) in terms of ecosystem, the human population supplies or recycles very few nutrients in turn because no system of tree plantation has so far developed to contain the process of deforestation. As the human population has grown and continues to grow, more and more demands are placed upon the forest rendering any recycling provisions difficult. As the local arable land gets extended, the forest area shrinks, and the consequent decrease in fertility brings a decline in the yields. In addition, the reduction of forest land also narrows down grazing area reducing the fodder available for the livestock which adversely affects the scope of livestock raising.

Population increase in the study area has not only led to the depletion of forests and fuelwood, fodder, timber, and grazing opportunities. Removal of the forest cover has also accelerated soil erosion. Increasing grain deficiency among the farmers was one obvious consequence.

Finally, loss of ground cover due to disappearance of natural vegetation also results in a process of aridization (Hoffpauir 1974) whereby the moisture contained in the soil gradually gets reduced through evaporation. Besides reducing the immediate fertility of soil, aridization leaves a longer term impact on the region's climatic pattern. A relatively low, uncertain rainfall due to irregular start of the monsoon, observed since a few years, is one manifestation of aridization here. In order to maintain a harmonious life pattern, a balanced relationship between the various components of the local ecosystem must be maintained. The only alternative would be more and more eco-hazards in the future.

CONCLUSION

In an agricultural society like ours, cultural ecology is concerned with the strategies used to transform the natural environment into a system for the sustainable generation of natural resources and then to use these for subsistence and profit. Cultural ecology in this context becomes the study of adaptive processes by which human societies and cultures adjust through subsistence patterns to a given environment. The lack of other alternatives more reliable than agriculture for earning a living has affected lands and forests adversely due to the increasing pressure of population which brings economic and social deprivation of the Rajbanshis solely dependent upon these resources. In certain respects the migrants have even replaced these people from their native land. As land becomes scarce, Rajbanshis have started to intensify and

diversify their agricultural practices by improving irrigation system, adopting crops like wheat and maize, and by changing their cropping practices. But the degree of change is limited and is determined by the ecological potential and the economic condition of these people for investment in improving the existing situation. A general pattern of shift from mono-cropping to multi-cropping and mixed cropping, and from cereal cultivation to cash crop cultivation has also been observed in the study areas. They have also started growing vegetables for sale and run small scale trading businesses and have taken to seasonal migration to generate sources of cash. Thus, even as the subsistence activities are changing, the respective socioculture practices of the people are also undergoing some modifications to meet the changing needs of the time. They have changed their food habits and have started to use maize and millet in their diet. They have also considerably substituted their conspicuous consumption and other expenses on tradition and rituals, adopting alternative forms such as *Dhuki* and *Damedome Biha* in their marriage practices. They are now abandoning the custom of *Bhumi Dan* (Land Gift) during rituals because time and resources are in shorter supply. All these changes in the local socio-cultural practices and economic activities have developed as their resistance to the environmental conditions and are the culturally structured adaptive strategies of the Rajbanshis for survival in the changing context of Rajgad and its environs.

NOTES

1. This article is based on the author's field material collected for his Masters degree thesis on the Rajbanshis of Rajgad VDC of Jhapa in 1993 - March 1994. The fieldwork was funded by the Tribhuvan - Bergen Human Ecology Programme, Kathmandu.
2. The author is grateful to Dr. Krishna B. Bhattachan for his helpful comments and suggestions.
3. For details on the application of the cultural ecological method to study different human societies, see Moran (1982); Netting (1980); and Rambo (1983).
4. For a more extensive and detailed understanding of the core and non-core elements of cultural ecology, see Rambo (1983).
5. See Sanyal (1965); Berile (1985); and Bhattarai (1984) for details about the non-core elements of the Rajbanshi culture which basically includes the Rajbanshi language, religion, art, and values.
6. See Gurung (1989).
7. See Ojha (1983), and Dahal (1983).
8. In the festival of *Maghesagaranti* a large amount of goat meat and fish is consumed and slaughter of 20-30 goats in one Rajbanshi village is common.
9. Play or drama of the gods such as Ram and Krishna is frequently arranged in the Rajbanshi village in winter after the crops are harvested. The host households pay and provide good food to a group of 20-30 participants of the *Lila* and other guests for about a week to fifteen days.
10. See Bhattarai (1994) for details on the ritual expenses of the Rajbanshis.

REFERENCES

- Anderson, J.N
1972 "Ecological Anthropology and Anthropological Ecology", J.J Hunigman (ed.): *Handbook of Social and Cultural Anthropology*. Chicago: Rand McNelly (pp. 143 -78).
- Bajracharaya, Deepak
1983 "Deforestation in the Food/ Fuel Context: Historical and Political Perspective from Nepal", Jack D. Ives (ed.), *Mountain Research and Development*, Vol. 3, No. 3 (pp. 277-340).
- Barth, Fredrik,
1956 "Ecological Relationships of Ethnic Groups in Swat, Northern Pakistan", *American Anthropologist*, Vol. 5.
- 1964 "Competition and Symbiosis in North-East Baluchistan", *Folk*, Vol. 6, No. 1.
- 1967 "Economic Sphere in Darfur", R. Firth (ed.): *Themes in Economic Anthropology*. London : Tavistock Publications.
- (ed.) 1969 *Ethnic Groups and Boundaries*. London: Allen and Unwin.
- Bennet, John
1969 *Northern Plainsmen: Adaptive Strategies and Agrarian Life*. Chicago: Aldine Publishing House.
- 1976 *The Ecological Transition: Cultural Anthropology and Human Adaptation*. New York: Pergamon Press Inc.
- Berlie, John
1985 *The Rajbanshi: A Complex Ethnic Group of South-East Nepal and Bengal*. Kathmandu: Regmi Research Centre.
- Bhasin, Veena
1988 *Himalayan Ecology. Transhumans and Social Organization*. Delhi: Kamala-Raj-Enterprises.
- Bhattarai, Hari Prasad
1994 *Cultural Strategies of Rajbanshis for Adaptation : Cultural-Ecological Study of the Rajbanshis of the Rajgadh Village in Jhapa District* (A Master's degree thesis submitted to the Central Department of Sociology/Anthropology, Tribhuvan University).
- Bista, Dor Bahadur
1972 *The People of Nepal* (2nd Edition). Kathmandu: Ratna Pustak Bhandar.
- 1989 *Fatalism and Development: Nepal's Struggle for Modernization*. Calcutta : Orient Longman.
- Boserup, Ester
1965 *Condition of Agricultural Growth: The Economics of Agrarian Change under Population Pressure*. London : Allen & Unwin.
- Caplan, Lionel
1970 *Land and Social Change in East Nepal: A Study of Hindu-Tribal Relation*. Berkeley : University of California Press.

- Central Bureau of Statistics
1991 *Statistical Year Book of Nepal*. Kathmandu: HMG National Planning Commission Secretariat.
- Chhetri, R.B.
1987 "Migration, Adaptation and Socio-cultural Change: The Case of Thakalis in Pokhara", *Occasional Papers of the Central Department of Anthropology/Sociology, Tribhuvan University*, Vol. 1.
- Cox, Thomas
1989 "Lamtang and Hindu Norms as Political Language: A Critical Perspective on Sanskritization Theory", *Contributions to Nepalese Studies*, Vol. 16, No. 1 (pp. 11-19). Kathmandu : CNAS, Tribhuvan University.
- Dahal, Dilli Ram
1978 *Indian Ethnic Group in the Nepal Terai*. Kathmandu: CNAS, Tribhuvan University.
- 1981 "The Concept of Economy in a Peasant Society: A Case Study of the Athpahariya Rais in East Nepal", in *Contribution to Nepalese Studies*. Kathmandu: CNAS, Tribhuvan University, Vol. 8, No. 2.
- 1983 *Poverty or Plenty: Innovative Responses to Population Pressure in an Eastern Nepalese Hill Community* (Ph. D. thesis in Anthropology). Honolulu: Univeristy of Hawaii Press.
- 1985 "Population Growth, Land Pressure and the Development of Cash Crops in a Nepali Village", in *Contributions to Nepalese Studies*. Kathmandu: CNAS, Tribhuvan University, Vol. 13, No. 1.
- Dahal, Tej Raj
1991 *Population Growth, Land Use and Cultural Practices: A Case Study of Dhajjan Village in Jhapa District, East Nepal* (Unpublished M.A. dissertation submitted to Tribhuvan University).
- Fisher, James F.
1990 *Sherpas: Reflections on Change in Himalayan Nepal*. Delhi: Oxford University Press.
- Gaige, Frederick H.
1975 *Regionalism and National Unity in Nepal*. Berkeley: The University of California Press.
- Gautam, Rajesh
1994 *Tribal Ethnography of Nepal*, Vol. II. Delhi: Book Faith India.
- Geertz, Clifford
1963 *Agricultural Involution: The Process of Ecological Change in Indonesia*. Berkeley: University of California Press.
- Gurung, Harka
1989 "Ecological Change", Kamal P. Malla (ed.), *Nepal: Perspectives on Continuity and Change*. Kathmandu: CNAS, Tribhuvan University.

- 1989 *Regional Patterns of Migration in Nepal*. Hawaii: Papers of the East-West Population Institute, No. 113.
- Gurung, Om
1992 "Cultural Ecology" (unpublished article).
- Haaland, Gunnar
1991 "The Ecology of Choice and Symbol". *Essays in Honor of Fredrik Barth*, Haaland et al. (ed.). Bergen: Alma Mater Forlaget AS.
- Hardesty, Donald. A
1977 *Ecological Anthropology*. New York: John Wiley and Sons.
- Harris, Marvin
1974 *Cows, Pigs, Wars, and Witches: The Riddles of Culture*. New York: Random House.
- Hawley, Amos A.
1986 *Human Ecology: A Theoretical Essay*. London: The University of Chicago Press.
- Hoffpauir R.
1974 "The Wasting of Paradise: An Ecological View of Subsistence in the Nepal Himalayas" (paper presented at *Conference on Nepal*), Claremont California.
- Macfarlane, Alan J. *Resources and Population in Nepal: A Study of Gurungs of Central Nepal*. London: Cambridge University Press.
- Mishra, Chaitanya; T.R. Pandey; L.P. Uprety
1992 "Peak-Period Labour Allocation in Terai Agriculture" (paper presented to *Congress on the Sociology/Anthropology of Nepal*). Kathmandu.
- Moran, Emilio F.
1990 *The Ecosystem Approach in Anthropology*. Ann Arbor: The University of Michigan Press.
- Netting, Robert McC
1997 *Cultural Ecology*. London: Benjamin/ Cumming Publishing Co.
- Ojha, Durga P.
1983 "History of Land Settlement in Nepal Terai", *Contributions to Nepalese Studies*. Kathmandu: CNAS, Tribhuvan University, Vol. 11, No. 1.
- Orlover, B.S.
1980 *Ecological Anthropology*. Annual Review of *Anthropology* (pp. 234)
- Poffenburger, Mark
1980 *Patterns of Change in the Nepal Himalayas*. Delhi: The Mcmillan Company of India Ltd.
- Rai, Navin K.
1985 *People of the Stones: The Chepangs of the Central Nepal*. Kathmandu: CNAS, Tribhuvan University Press.

- Rambo, Terry A.
1983 *Conceptual Approach to Human Ecology, Research Report No. 14*. Honolulu, Hawaii: East-West Centre, Environment and Policy Institute.
- Rappaport, Roy
1979 *Ecology, Meaning, and Religion*. California: North Atlantic Books.
- Ray, Ellen
1991 *Environment, Subsistence and System*. London: Cambridge University Press.
- Regmi, Mahesh Chandra
1971 *A Study of Nepali Economic History*. New Delhi: Manjushri Publishing House.
- 1976 *Land Ownership in Nepal*. Berkeley: University of California Press Ltd.
- 1978 *Land Tenure and Taxation in Nepal*, Second Edition. Kathmandu: Ratna Pustak Bhandar.
- Sanyal, Charu Chandra
1965 *The Rajbanshi of North Bengal*. Calcutta: The Asiatic Society.
- Shrestha, Bharat; L. Uprety; T.R. Pandey
1991 *Social Dynamics of Deforestation*. Kathmandu: APROSC.
- Smith, C.S.
1986 *Dictionary of Anthropology*. London: The Macmillan Press Ltd.
- Stevens, Stanley F.
1993 *Claiming the High Ground: Sherpas, Subsistence, and Environmental Change in the Highest Himalaya*. Berkeley: University of California Press.
- Steward, Julian H.
1995 *Theory of Cultural Change: The Methodology of Multilinear Evolution*. Urbana: University of Illinois Press.
- Vayda, Andrew P.
1969 *Environment and Cultural Behaviour: Ecological Studies in Cultural Anthropology*. New York: The Natural History Press.
- Van Beek, W.E.A.
1993 "Process and Limitations of Dogon Agricultural Knowledge", *An Anthropological Critique of Development: The Growth of Ignorance*, Mark Itobart (ed.). London: Routledge.