

Over-exploitation of North Sub-Himalayan Vegetal Resources : Its Impact on the Brahmaputra Valley of Assam

K.C. Mahanta

Department of Anthropology, Dibrugarh University, Dibrugarh 786 004, Assam, India

KEY WORDS Commercial Exploitation. Vegetal Resources. Bank-erosion. Siltation. Storm-water Pools (*Beels*). River-system.

ABSTRACT Commercial exploitation of the vegetal forest resources coupled with intensified slash and burn cultivation in extensive areas as a sequel to rise of indigenous tribesmen in Arunachal Pradesh following introduction of modern medical service and ceasing of internecine warfare in the post-1950 years led to large-scale top-soil erosion in the northern Himalayan ranges, resulting in heavy siltation of the Brahmaputra and other river courses and inland storm-water pools (*Beels*) and extensive bank-erosion all over the valley. The man-induced environmental phenomena in the upper reaches of the Brahmaputra river-system have direct impact upon the community down in the valley by way of loss of land and obliteration of the people's sources of food.

Man derives his sustenance from available resources of his habitat. Generally, a habitat is considered as ideal if it abounds with edible flora and fauna for direct consumption for sustenance. From empirical observation it could be asserted that the geo-physical structure of a habitational land-mass maintains a certain degree of stability after being subject to occasional natural calamity or catastrophe in the form of tectonic movements or geo-physical upheavals. Land-mass is never constantly unstable. Stability in general prevails for a protracted period after a natural calamity of perceptible magnitude. At times a tectonic movement may result in large-scale geo-physical metamorphoses making the entire land-mass unfit for vegetal growth and human habitation. Man makes choice of a land-mass for habitation on the prime consideration of its yield-potentiality. Sterile utterly unproductive land is scarcely chosen for sedentary habitation. Through constant human use, a land-mass loses its yield-potentiality that, however, gets recouped through in-built system of environment in and around the land-mass. River-systems and

other inland perennial natural water-bodies that serve as reservoirs of storm-waters in combination with the land features and climatic conditions go on renewing the constantly resulting short-falls of the yield-potential through cycles of rain, flood, river-transportation and deposition, varying seasonal intensity of sunshine etc.

GEO-PHYSICAL STRUCTURE

In the context of the above observation, it is proposed to undertake a cursory survey of the Brahmaputra valley topographical and geo-physical features with a view to assessing the causative factors that have adversely affected the socio-cultural life of the Assamese people to a considerable extent.

The sprawling 720 km long Brahmaputra valley is the traditional habitat of the Assamese par excellence. Starting from the foot-hills of the Tirap ranges of Arunachal Pradesh in the east down to Dhubri in the west, the valley is a relatively thickly populated region that has since time immemorial been ideally self-suffi-

cient in respect of basic needs of human survival.

From geographical perspective, according to Das (1970 : 18), the Brahmaputra valley "can be divided into two parts, the Lower Assam valley, where the plains are broken by isolated groups of hills, and the Upper Assam valley, where unbroken plains lie from the Himalayas on the north-west to the Naga Hills on the south-east." The valley is possessed of a large number of inland water bodies - perennial natural pools of water called *beels* serving as reservoirs of storm-waters as referred to above. The valley is one of the highest rain-fed regions of the world receiving on an average rainfall of 216 cm per year. The characteristic riverine system of the valley being highly criss-crossed by a large number of tributaries, the region is highly prone to recurrent floods. Further there are a large number of bogs and swamps studding the whole length of the valley, and these have ever since presented the characteristic feature to the inhabitants and the various animal species of the region. Besides the multiple water bodies, the entire land-mass is typical of sub-tropical ever-green forests. Nearly six decades back, Rowbotham (1929 : 122) observed, "there were as many as 3,234 sq miles (8,372 sq. km) of ever-green forests in Assam". Das also spoke of commercially valuable veneer species of trees in the Assam forests (Das, 1970 : 67).

Before the region came to be exploited commercially around mid-fifties, the rich fertile valley had yielded to its population sufficient quantity of rice, the staple diet of the people, and other cereals and pulses and multiple varieties of fruit and vegetables, both wild and cultivated. The numerous natural water bodies and bogs and swamps and marshy lands and streams abounded with profuse multiple varieties of fish that more than sufficed the day to day optimum need of the people. Further, the far flung forested regions all over the valley provided the people with excellent occasional hunting grounds. The forests teemed with various wild animals like deer, wild boars, goats,

dogs, jackals, buffaloes, wolves, mithons, rabbits, bats, squirrels and several varieties of edible snakes and birds, frogs and mollusks. The games served as special dietary items of delicacy, breaking the monotony of the people's daily food habit. Furthermore the people were in the habit of feeding on numerous varieties of wild roots, shoots, tubers and flowers. The jungles in the neighbourhood of the village - settlements exuberant with wild vegetations served as natural kitchen gardens for each and every household in Assam.

The whole geo-physical spectrum began to worsen ever since the fifties when major developmental works in conjunction with emerging demographic features of the Himalayan highland regions came to be initiated. Since early fifties for nearly four decades, topographic land features of the entire northern Himalayan highlands and the Brahmaputra valley have undergone far-reaching geo-morphological changes causing large-scale fluctuations in the entire land-mass including the natural inland water bodies of the valley. Multiple factors have cumulatively caused the climatic fluctuations.

Some of the causative factors are as follows:

i) Intensified Slash and Burn Cultivation :

Thanks to modern medico-social measures and ceasing of internecine fights and warfare among the war-like tribesmen following introduction of effective administrative processes in the post-Independence period, there has followed a high growth-rate of indigenous population in Arunachal Pradesh in the last four decades. This has obviously necessitated more and more hill-slopes to be brought under traditional slash and burn or shifting cultivation during this period. The down-flowing of top-soil has since been increasing alarmingly compared to earlier times when there was hardly any pressure of population. The Brahmaputra and almost all the tributaries developed large-scale siltations. The results are ominous bank-erosions of most of the rivers including the Brahmaputra have since become

a chronic problem. Over the last fifty years or so the valley lost thousands of hectares of agricultural lands. Further the rivers with silt-laden beds get easily over-flooded inundating the plains more frequently than ever before.

ii) *Deforestation* : In the last four decades in an effort to usher in development, reckless felling of trees for commercial purposes in Arunachal Pradesh has largely denuded the top-soil leading to heavy soil erosions and river-bed siltations and flood and bank-erosion in the plains.

iii) *Urban Growth* : In recent years the process of urbanization in Arunachal Pradesh hills resulted in clearance of virgin forests for establishing new townships and construction of network of roads. These caused extensive soil erosions plaguing the whole environmental system.

iv) *Open Cast Mining* : The recovery of coal deposits that requires removal of vegetal cover with underlying soil mantle and overlying rock masses results in reshaping of topography and generation of great volume of debris. Also construction of a network of roads further aggravates the problem of land degradation. In open cast mining in the mountains, rich soil together with rock masses is scrapped off and pushed downslope, causing great damage to vegetation and springs and streams.

For nearly last ten years open cast mining for recovery of coal is being carried out in the Ledo and Margherita coal fields in Upper Assam. Perhaps, as reported, the whole operation is conducted under strict scientific perimeters. Notwithstanding the apparent innocuous nature of open cast mining at Ledo and Margherita, it calls for intensive scientific study to assess any adverse effect whatsoever in the long run.

Agriculture being the prime occupation in the Brahmaputra valley, the river and its tributaries form the life-line for economic development and prosperity of the region. For this, it is imperative that man-nature balance be preserved and maintained. From the preceding

delineations, it could be noted that man-nature relationships in the Brahmaputra valley have been seriously tilted against the basic existential needs of man. It appears the balance is not transitory, but a continuing one and portends an ominous trend. The most obvious loss came to be wrought to the numerous *beels*, that virtually served as the reservoir of varieties of fish and contained several edible aquatic species of weeds. Most of the *beels* have become traceless as a result of heavy deposit of river-borne mud and soil during floods. The disastrous loss of inland sources of fish is obviously attributed to intensified slash and burn cultivation coupled with large-scale deforestation and consequent soil erosion all over the northern Himalayan sub-tropical evergreen forest belts in Arunachal Pradesh. The collection of fish from the *beels* has been an age-old practice of the Assamese in the Brahmaputra valley. Long before the valley was affected geo-physically, the Brahmaputra and all the tributaries and rivulets in the valley did serve as perpetual sources of fishing for home consumption. But rivers are always treated as secondary sources; it was the *beels*, bogs and marshes that were the prime sources of fishing for domestic use. The widespread deforestation and intensified slash and burn cultivation affected the river-courses turning them shallower with huge deposits of sediments all along their lengths. Before 1950, the courses of the Brahmaputra and some of the large tributaries were navigable with large British-owned streamers tugged with barges. While at present only diesel-run small vessels and motor boats can ply along the mid-course of the Brahmaputra, none of the tributaries have remained navigable even with small power-driven boats and vessels. This shows the magnitude of the problem of river-deposition owing to large-scale erosion caused by wanton destruction of forest resources over the last half a century. Apart from deterioration in the natural breed and growth of fish, scores of riverine villages have been eroded away by the Brahmaputra. Erosion by the Brahmaputra and several

of its tributaries has become a perpetual problem for the people of the village. Further the enormous quantum of monsoon showers from mid-May to August-end coupled with Himalayan snow-waters during these summer months brims over the river-banks causing four to seven bouts of floods against normal two to four bouts in the pre-1950 years.

The extensive defacement of geo-physical features in the upper reaches of the Brahmaputra river-system have had the most adverse consequences in the form of loss of agricultural and homestead lands and obliteration of the *beels*, the natural fish-breeding inland water-sources of the valley. The results are obvious; the Assamese noted for their well-known fish-eating habit are nearly starving of fish in their daily diet. These disastrous consequences of man-nature imbalances could be visualized in each and every habitation zone in the Brahmaputra valley. The disastrous impact of environmental distortions that have become more and more manifest have virtually crippled the rural economy of the people as could be assessed from empirical observations.

METHOD OF STUDY

In the context of the above observations of the geo-physical structure of the Brahmaputra valley *vis-a-vis* man-induced environmental degradation in the northern sub-Himalayan ranges, the paper proposes to take up a study of the far-reaching consequences of the community in a select riverine region, namely, the revenue circle of Palasbari in the district of South Kamrup in the Brahmaputra valley of Assam. The author as one born and brought up in the locality in the town of Palasbari could well visualize from his childhood days till 1950 the aforesaid environmental phenomena with some of which he himself was involved as a participant in various roles as an inhabitant. For overall data for both pre- and post-1950 periods, a number of elderly persons including a few octo- and hepto-generians were interviewed.

The personal observations of the author in the post-1950 period for some five years till date also helped him sift the unstructured pieces of information received through the interviews.

THE LOCALE

The Palasbari revenue circle nearly 80 sq. km in area is one of the nine revenue circles comprising the district of Kamrup in Assam. The circle is composed of 36 villages. It is situated to the south of the river Brahmaputra which passes from the east to the west across the heart of the district. The whole district is a highly wet rain-fed area, "the annual rainfall varying between 152.4 cm and 203.2 cm and the vegetations being mostly deciduous" (Das, 1970 : 26). The southern part of the district is noted for extensive areas of Sal (*Shorea robusta*) bearing forests. The Palasbari circle occupies almost the central part of the south Kamrup district. The relief features of the circle are a peculiar combination of two outstanding hillocks and some undulating highland areas along the extensive subsidence and swampy regions formed of as many as eight major *beels* and a rivulet originating from the Khasi and Jaintia hill ranges of Meghalaya and joining the Brahmaputra across the Palasbari town.

The most outstanding feature of the 36 villages under the revenue circle under study was the environmental congeniality for the growth of essential items of life in optimum quantity. It remained more or less unaffected till the dawn of the commercial era in the north-eastern region of the country by around 1950. On the one hand, the plain agricultural lands annually being enriched with river-borne alluvia after the floods used to yield luxuriant crops including the staple of the people and various other cereals. The highland regions in the circle on the other hand served as ideal gradens for growing cotton and mulberry plants for rearing silk cocoons. The people used to have the ready domestic supply of handloom cotton

clothes and three famous varieties of silk fabrics, namely, Pat (*Bombyx mori*), Muga (*Antheral assamensis*) and Endi (*Philosamia racenii*). Pat and Muga fabrics in variably treated as high-valued household treasures were used on festive or ceremonial occasions. Endi, also a valuable fabric, serves the day to day need as a warm wear during winter. Apart from food and clothing, in the matter of housing, it could be learnt that none of the villages under the revenue circle ever felt the dearth of house-building materials – hard-wood trees, bamboo, reeds, cane and thatch. Four or five varieties of hard-wood trees and also some six varieties of bamboo were abundantly available in the undulating regions around the hillocks and other highland areas. Several varieties of reeds and cane grew profusely in the swamps and the shores of the *beels*.

The most essential item the Assamese crave for was fish. The item abounded in abundance in the Brahmaputra and the rivulet passing across the Palasbari town besides the eight large *beels* and several swamps of the region. Fish, a palatable and favourite item in the Assamese diet, never attained a commercial or market significance anywhere except in the city of Guwahati to some extent. Practice of fishing as an occupation is ever treated as a taboo by all sections of the Assamese save a small section of the people belonging to the caste groups of Kaibartta and Namasudra. It is these caste group people who practise fishing preferably in the river Brahmaputra and dispose of the catch in the cosmopolitan market in Guwahati. Contrarily, practice of fishing for domestic consumption is open to all sections of the Assamese. Fishing in the land-locked *beels* and swamps is a pleasure-giving almost daily venture and is virtually treated as a sort of pastime. To all Assamese village folk, regardless of age and sex, individual or group fishing in the *beels* is an obsession. It is practised throughout the year, there being used different traps and implements for fishing in accordance with seasonal variations.

The entire age-old practice of fishing involving a whole nationality has almost come to a standstill owing to complete or partial obliteration of most of the *beels* through river-borne silt and mud from the upper reaches of the river-system of the valley. As many as five *beels* out of the eight in the Palasbari revenue circle region have become almost traceless; the remaining three have become too shallow to help breed fish naturally. The most outstanding instance of natural storm-water pools (*beels*) becoming unfit for use for community benefit is the erstwhile pictureque Dipor Beel at the north-western outskirts of the city of Guwahati. The *beel*, about 7 km long and 4 km wide, situated at the foot-hill region of the Khasi and Jaintia hill ranges has turned into a shallow pool of water with flood water-borne deposition of sediments over the last forty years, making it unfit for natural breed and growth of fish.

DISCUSSION

The environmental sketch of the northern sub-Himalayan forest-belts and the snow- and rain-fed river-system of the Brahmaputra valley, outlined above, has virtually built up the characteristic cultural ecology of the Assamese of the valley. The outstanding configurative features of the culture especially food-habit and related economic pursuits and endeavours for provisions for clothing and shelter are the spontaneous outcome of the ecosystem of the region. The Assamese are noted for their voracious fish eating habit. That the Assamese put enormous value to fish as a culinary item is evident from their notion that a marriage or any other feast without fish as a delicacy is a poor one. Fish is served in sumptuous quantity on the occasions of household ritual functions or ceremonies. The more the quantity of the item, the more is the fame and standing in the society of the host. Also the Assamese's overall personality build-up especially in the field of physical labour input is very much an outcome of the prevalent ecosystem. Thus as the pre-

industrial congenial ecosystem of the region provided the people with all basic necessities of life, so the Assamese's legendary leisurely happy-go-lucky life is virtually the result of the ecosystem. The most leisurely and insipid economic pursuits of the Assamese that are strikingly manifest at raising just a single crop a year from the highly fertile lands in contrast to three crops a year by their non-Assamese neighbours are well within the periphery of the environmental milieu. From historical perspectives it could well be asserted that the traditional Assamese cultural ecology is indeed a composite one accumulated and assimilated through the lengthy historical vicissitudes within the framework of the ecosystem of the region at large. In the remote past especially before the advent of commercialization and westernization, in this part of the country, the home-grown cultural ecology nourished and sustained by the ecosystem of the region was hardly subject to any distortion. Food, clothing and shelter, the three basic ingredients of life in the pre-industrial era in the Brahmaputra valley region, bear testimony to the role the ecosystem of the region played in shaping the cultural ecology of the region. The *beels* or the river Brahmaputra are so vitally conjoined with the life of the people that no village settlement in the revenue circle of Palasbari is situated beyond a maximum distance of 3 km from one *beel* or the other. This is because the sources of fish must be within easy reach. The people could hardly get rid of these water sources that used to serve as store-houses for supply of the essentials of life - fish and leafy vegetables, fodder for cattle, reeds, firewood etc.

The siltations of the water-sources especially the *beels* have adversely affected the age-old food-habit of the people besides stopping the supply of other essential items of life.

It is thus evident that the introduction of Western commercialization model has had far-reaching adverse consequences. It is, therefore, pertinent to question if the import of the Western model for ushering in development does at all fit into the socio-cultural milieu in this part of the country. Obviously, the way stereotyped development is sought to be brought about in the socio-cultural system of the region is invariably likely to be fraught with ominous results as could be viewed in the Brahmaputra valley environmental metamorphoses that come to be effected through pursuits of unscientific methods and practices. It is a failure of the socio-political system of the region that socially unrewarding spractices like the extension of intensive slash and burn cultivation in the hill slopes ostensibly for feeding the rising population or extensive lumbering leading to large-scale deforestations could go on unabated. Ways and means could perhaps be devised to achieve the optimum degree of material development without drastically defacing the life-soothing relief features of a given environment. After all, all environments have a global value and significance.

REFERENCES

- Das, H.P.: *Geography of Assam*. National Book Trust, India, New Delhi (1970).
 Rowbotham, C.V.: *Regeneration of Tropical Evergreen Forests*. Proceedings of the 3rd Silvicultural Conf., Dehra Dun (1929).