3.0.0.0 CONCEPT AND METHODOLOGY

The present study is based on certain conceptual issues and is also beset with some empiric methodological questions. These concepts and methodological problems are dealt with briefly in this chapter.

3.1.0.0 CONCEPTUAL ISSUES

The theoretical considerations which appear as relevant to the objectives of the present work include the very broad concepts of land as an amalgam of resources and as an ecosystem as well as the concept of environmental balance in general and also the relatively fragmented but locally very important questions of forest as a resource process, as a natural ecosystem and as a human ecosystem.

3.1.1.0 SPACESHIP EARTH

The broadest concept which engulfs the relatively minor questions of forests, forest-based communities, deforestation, wasteland or instability of land etc. is that concerning the stability of the world civilization and the ultimate survival of mankind on this planet. Scientists and social thinkers today almost equivocally claim that only a stationary state economy can ensure a permanent tenure of man on this planet (Daly, 1971), a view which had been advocated long back in 1857 by John Stuart Mill, the great synthesiser of classical economics, in his Principles of Political Economy. The principles on which the 'spaceship earth' (Simmons, 1974) should continue to revolve round the sun for ever are based on the assumption of an equilibrium between an ever renewable supply of resources, principally energy, on one side of the scale and a
stationary population feeding on the renewed energy on the other side. Ecologists have very successfully demonstrated that such a stability in nature is guaranteed only by bio-diversity and certainly not by selective extermination of species which do not come to man's immediate benefit. One of the chief responsibilities of the scientific community of the world today, therefore, is to find out a mechanism to control population growth to a limit which is sustainable by essentially the biological process of conversion of solar energy into food and other materials supported by the use of other forms of flow energy like wind, ocean current, solar power etc. The other responsibility is to curb the rate of consumption through such measures as standardisation and miniaturisation of products, energy saving techniques, waste-recycling and finally to devise a zero-waste technology.

It has been said that the initial success of man in creating a surplus from land through sedentary agriculture depended heavily upon his choice of immature ecosystems with a surplus energy stock or on retarding the process of maturity by selective despeciation (Bourne, 1976). At the same time it has been rightfully claimed that his present crisis also follows from the same logic of depending upon an additional source of energy from outside the ecosystem boundary over the amount which can be fixed by the local ecosystem. On the other hand, the communities which chose to live in mature ecosystems along with their full range of specietal diversity, as tribals in plateau-forest complexes, achieved a lesser degree of success but have survived better against internal stresses by a spontaneous mechanism of population control. That they have not been able to survive successfully against external threats on their habitat and culture is a different question which should not undermine the validity of their world view. To understand the rationality behind this kind of a world view and its relevance to the contemporary global ecological crisis, it is necessary to review the concepts of forests as a resource process, as natural ecosystems and as human ecosystems.
3.1.2.0 CONCEPT OF LAND

A land can be regarded as an object of trade or exchange or even as a responsibility which has been given to the holder of the land by his forefathers. In the first case, land is perceived as a private property and its possessor has got every right to retain it or sell it out in exchange of money. Here the holder is interested in his own economic benefits. But in the second case, the property holder has to retain the property, maintain it and improve its productivity with care not for his benefit alone but also for the benefits of his family, his friends and all those who belong to his community. When land is taken as a private exchangeable economic resource then its possessors may not be interested in the alternative environmental possibilities associated with the land. But when land is perceived as a resource for the community then only its proper qualities are judged by the community and it is given to a particular mode of use out of different alternatives (Bhar, 1989).

Land is not necessarily a resource by itself. The usefulness of land depends on the method and techniques of the land utilization. To avail the long run potential of a land it is required to utilise the land with a clear perception and with a proper selection of the mode of use. So, a land is rarely a resource by itself from the wider communal viewpoint; but it is a container of different resources which are used by proper management (Biswas, 1989).

3.1.2.1 LAND ECOSYSTEMS

From the inherent implications of the wider communal viewpoint of land we understand that land is a natural resource system or "natural ecosystem linked either way hierarchically and taxonomically with supersystems and sub-systems" (Biswas, 1989). All these systems have throughput of energy which is converted successively by the food chain and this converted energy is ultimately received
by man, the topmost class of the trophic pyramid. So man is responsible for the use of land ecosystem skillfully for long-term survival of humanity.

With the domestication of the plant kingdom man turns the natural ecosystems into agricultural ecosystems in various ways such as by choosing the suitable species, through removal of unwanted life forms, by providing external energy supply, by making open the closed biogeochemical cycles of natural systems and thereby reducing the net primary production of plant material over time.

In biomass production human technology cannot effectively replace the natural system. The Alpine and Tundra vegetation regions are exceptions. The natural systems of most regions are capable of producing larger quantities of dry matter per unit area than are produced by the crops of human choice.

Human intervention in natural ecosystem by agricultural ecosystem produces a number of variations in productivity of energy and biomass. There are a lot of examples. In Britain the cereal systems produce 2,000 million calories from a hectare of land, while the cereal fed livestock systems produce only 180 - 340 million calories annually. The energy content of lamb meat is only about one percent of the total input of solar energy required to produce it while that of cereals is about 16 percent (Duckham & Masefield, 1970).

In the farming systems of the western countries, there is a great inefficiency, when measured by the ecological yardstick, due to enormous expenditure of energy and wastage involved. In our country, through a research work on the cropping systems of the seven districts of western Bengal, it "is observed that these districts are capable of capitalising on not more than 52 - 66 percent of the temperature resources, 63 - 71 percent of the rainfall resources, 43 - 59 percent of the total hours of bright sunshine and 54 - 69 percent of the cropping time available. More interestingly,
much of the well known prosperity of the district of Barddhaman appears to be 'bought' or 'subsidised' from external sources as the efficiency of its cropping system in utilising the free atmospheric resources of temperature, rainfall and sunshine is not above mediocrity compared to other districts" (Biswas, 1989).

3.1.3.0 FOREST AS A RESOURCE PROCESS

Resources used by the human community can be logically sub-divided into three categories:

(a) resources used in the human metabolic processes and altered after use;

(b) resources used outside the body; these resources may be taken in their raw form or biologically or chemically processed from both renewable and non-renewable resources and are altered after use;

(c) resources used outside the body and their appropriation leaves them unaltered (Simmons, 1974).

Simmons (1974) defines resource process after Firey (1960) as "the total flow of a material from its state in nature through its period of contact with man to its disposal". He specifically identified several resource processes like unused lands of the world, specially protected landscapes and ecosystems, forestry, food and agriculture, recreation and tourism, water, sea, minerals, energy, wastes and pollution.

Interrelations between resource processes and ecosystems are definite. Odum (1959) defines ecosystem as that part of nature where living organisms and non-living substances exist and interact to produce an exchange of materials between living and non-living
parts. Therefore, forests should be considered as ecosystems dominated by trees. In forest ecosystems the leaves are the fundamental elements in the system, because they are the principal organs of photosynthesis which produces energy and constitute the productivity of an ecosystem. Since the biological productivity of forests has been manipulated by man from very early times for various purposes, forests can also be conceived as a resource process. Simmons (1974) identified two major modes of the use of forest resources:

(a) direct uses of forest wood and (b) indirect uses like water yields and animal products wherein the trees play a vital role. There is a third probable category involving the indirect uses of the manpower generated from those societies in whose ecosystems the wide species diversity of forest plants and animals plays a crucial role.

The energy and nutrient flow of the forest ecosystem are cyclic and there is a balance between loss and gain. This characteristic ensures forest ecosystems a long term stability. An ecologically sound resource process is, therefore, to be ensured in order to perpetuate the cyclic energy and nutrient flow, if forests are to be used as crop.

The forests have some uses conditioned by human culture and some intrinsic attributes. These attributes and uses are interrelated by various degrees of compatibility. Looking at a summary matrix (Table - 1) of interrelations, simplified from Clawson (1974), it would be easily understood that in reality the resource process of forestry is the meeting ground of a number of other resource processes like food, water, wildlife, wilderness, recreation and tourism.
Table 1

Interrelationships among Forest Uses & Attributes

<table>
<thead>
<tr>
<th>Landuse/Environmental Characteristic</th>
<th>Scenic Landscape</th>
<th>Recreation Opportunity</th>
<th>Wilderness +</th>
<th>Wildlife +</th>
<th>Natural Watershed +</th>
<th>Wood Production &amp; Harvest +</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenic Landscape</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Recreation Opportunity</td>
<td>+</td>
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<tr>
<td>Wilderness</td>
<td>++</td>
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<td>Wildlife</td>
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<tr>
<td>Natural Watershed</td>
<td>++</td>
<td>+</td>
<td>++</td>
<td>+</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>Wood Production &amp; Harvest</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

[After Clawson, 1974]

INDEX
+ + = High Compatibility
+  = Moderate Compatibility
-  = Incompatibility
Even if the far-reaching ecological questions are neglected in favour of immediate materialistic questions connected with forestry as a resource process, nobody can overlook or deny the economic losses incurred due to soil erosion, silting of reservoirs and water courses and resultant choking of drainage, problem of rural fuel supply, non-availability of wood etc., particularly in the Less Developed Countries where an appropriate forest policy is needed immediately (ICIHI, 1989).

3.1.4.0 FORESTS AS NATURAL ECOSYSTEMS

Natural ecosystems find their expressions on the surface of the earth through their existence in characteristic ecological niches. One of the best example of this expression is forest, the most complex of natural ecosystems (Simmons, 1974). Odum (1971) characterises forest ecosystems as "unsubsidised natural solar-powered ecosystem" because of its dependence largely or entirely on the direct rays of the sun as there is, if any, little available auxiliary source of energy to supplement it.

On contrary, forests for their spatial origin, biotic structure and community functions, are also included in community ecology. On this aspect Odum (1959) considered ecology as "the study of the structure and function of ecosystem", or less technically, the study of structure and function of nature, rather than the study of interrelationships between organisms and environment (Biswas, 1981).

In this chapter, thus, our analysis should be centered round two basic aspects of the forest ecosystem, structural and functional.

The structural basis of forest ecosystem includes:

(i) the composition of the biological community including different species of forests, their numbers, biomass, distribution and life history of populations in space;
(ii) the amount, spacing and availability of abiotic materials like water, nutrients etc; and

(iii) the gradients of conditions for survival like temperature, light etc. (Odum, 1959)

The functional basis of the forest ecosystem includes:

(i) the rates of production and the rates of respiration of the populations and the community or technically, the rate of biological energy flow through the ecosystem;

(ii) the rate of nutrient cycling or the biogeochemical cycles, and

(iii) biological regulation which includes the regulation of organisms by environment and vice versa (Odum, 1959)

Several structural features are common in forest community ecosystems having three biological components:

(i) producers or the chlorophyll enriched green plants capable of fixing light energy, technically termed as autotroph,

(ii) macro-consumers or animals consuming particulate organic matter, or the heterotroph/phagotrophs and

(iii) microorganism decomposers that release nutrients by dissolving organic matter or reducers or osunotrophs.

The arrangement of these biotic structural units in vertical space within the forest denotes to two definite strata, an autotrophic stratum above and a heterotrophic stratum below (Odum, 1959;
Kormondy, ed., 1965). One of the important aspects of ecosystem is productivity. Terrestrial natural ecosystems are characterised by a dependence on the movement of that accumulated energy through the system initiated by grazing herbivores (Kormondy, 1969). Forest ecosystem is the best example of these distinct functionaries. The energy captured moves through various structural levels or parts of the ecosystem from the primary producers to the tertiary consumers in a hierarchical system. This in turn is known as food chain in ecosystem. Continuation of food chain covers a number of production in different levels. The total assimilation rate of autotrophic producers in an ecosystem is termed as primary production or primary productivity. The total amount of organic matter fixed in the plant is called Gross Primary Production and that amount of organic matter stored in plant tissues in excess of respiration (during the period of measurement) is called Net Primary Productivity. Production at heterotrophic level is called secondary production. In ecosystem, net production is measured in terms of gross production minus plant respiration. This functional mechanism (Odum, 1959; Kormondy, 1969) or economy obviously determines the number of secondary and tertiary consumers existing within the system. This system of flow of energy from producer - consumer - reducers/decomposers is known as energy flow, an essential function of ecosystem (Odum, 1959).

The cyclic circulation of micro- and macro- nutrients in forest ecosystem is, in turn, another important function. Three major types of cycles are considered: the hydrologic cycle, biogeochemical cycle and sedimentary cycle. All these functional activities are interrelated. Thus forest ecosystem and its food chain are characterised by interlocking systems like grazing food chain, detritus food chain, energy cycle and biogeochemical cycles (Odum, 1959, Kormondy, 1969).
But in time of analysing forest ecosystem as community ecology, interests should center round structural characteristics like trophic structure, species diversity, dominance of species, their succession etc. Naturally, it will involve the interrelation between the organisms themselves. And from that, we should gradually come to the climax community and the concept of ecotones.

Considering all these aspects, we characterise a forest as one of the several terrestrial ecosystems where there is balanced relationship with producer, consumer and decomposers.

The producer community includes both the vascular plants, shrubs and undergrowth. Among them the most important producer species are sal, mahua and palas, sal being the dominant. These higher plants convert radiant energy by photosynthesis, though in some cases dominance of species depends on the succession of plants and state of the forests. Even the shrubs play an important role in the fixation and supply of energy to the next consumer. But it is logical to say that sal, mahua etc. produce more energy, due to their bigger leaf size and foliage. They are self-feeding and store a higher amount of energy excluding the amount of energy lost in respiration.

The primary consumer group includes rabbits, ants, flies, beetles, birds, spider, wild hogs, even larger animals like elephant etc. These communities depend fully on the producers for their metabolism. Energy consumed by them is not fully consumed rather they store energy in their tissues. This stored energy is further moved to the secondary consumer.

The secondary consumer group includes the communities dependent on primary consumer like snakes, birds, lizards, rats, mongoose, wild cats etc. These communities store energy in their body, in excess of their respiratory expenditure and become sources of energy to the tertiary consumers in the food chain.
The tertiary consumers in natural or terrestrial ecosystem are mostly the prey animals like wolf, lion, tiger etc. which depend on the energy stored by secondary consumers.

The human community living in the forest as top consumers collect energy from all trophic levels but in a balanced way without destroying the system, often creating new ecotones.

Last of all, the decomposer community is very important in dissolving and disintegrating nutrient compounds into single substances to be consumed by autotroph. They include various fungi, microbial organisms, bacteria, actinomycetes etc. whose respiratory energy intake is only nominal (Odum, 1959).

Haeckle as mentioned by Odum (1959) classified the types of interrelations in several categories. These are -

1) neutralism in which no population of the ecosystem is affected by other population associated with it;

2) mutual inhibition competition type in which all component populations inhibit each other's activity;

3) competition resource use type in which all population adversely affect each other to make the maximum out of a limited supply of resource;

4) amensalism in which one species is inhibited, other not affected;

5) parasitism;

6) predation in which one population directly attack and adversely affect the other;
7) Commensalism, the type in which one population is benefitted but the other is not affected;

8) Proto-cooperation, both populations benefit with association but without obligatory relations; and

9) Mutualism, the type of interaction in which growth and survival of both populations under natural conditions are fostered, neither can survive without the other. The term symbiosis in this context is used in the same sense as mutualism, but sometimes the term is used to cover commensalism and parasitism as well.

"Ecosystem" and "community" both have their importance in environment. In forest ecosystem, community has a role from the standpoint of commensalism. Both the producers and consumers, and the top consumers as human being, tribal settlers in our case have commensal relations to other populations. In some cases the interaction may not become symbiotic, but they never adversely affect other populations.

Human settlers (Odum, 1959) in the forest ecosystem have a definite wise selectivity in energy collection. In population and biomass pyramids a near equilibrium state is maintained by seasonal change of food regimen. Forest fruits and roots are consumed during appropriate periods. Preying on animals is also limited, according to their numbers. Thus the human community never act like predator to other populations. The population growth rate is also in broad accordance with the rate of energy production within the forest ecosystem.

Thus the human population settling in the forest as part of the system and community, have never allowed their number to increase beyond certain limit where disequilibrium may result in a negative effect in the system.
The next important issue is that the species and their diversity in terrestrial ecosystem help the system to mature. In a forest ecosystem the presence of a large consumer population is essential for the maintenance of the energy cycle and maturity. Combination of these two in an undisturbed forest is an epitome of stability attained through nature's investment in diversity (Simmons, 1974).

Therefore, their presence in the forest is never inimical, they are not destroyers of forests but users and not only users but they are commensal and symbiont to forests. This has been possible due to their world view of survival with a low level equilibrium.

### 3.1.5.0 FORESTS AS HUMAN ECOSYSTEMS

All environmental issues are human ecological in nature. This is due to the fact that the global environments, specific to space and human groups who intervene upon the environment according to their preferred culture and alter the environment differently. Therefore, the field of human ecology is the interface between nature and human culture; and the human ecological process, as observed by Sauer (1962) is the transformation of the natural landscape into the cultural landscape. Through this process, the biotic balance and the social equilibrium are maintained once they are achieved. This is also a process through which the transition from one relatively stable order to another is achieved (Park, 1952).

In order to apply biological analogy to the study of human society, two levels of human activity are identified - the biotic (community) and the cultural (society).

The biotic of nature gives rise to the community and also is based on the sub-social forces of competition. People are regarded at this level as 'individuals' who distinctively lack social attributes and therefore subject to the same impulses and forces as were plants or animals in their struggle for existence and for the acquisition of the
most favourable circumstances in which they live. On the other hand
the cultural level gives rise to the society and is based on strictly
social processes of communication and consensus in which people
with social attributes become 'persons'. Therefore, society is seen as
a super-structure lying above the more basic competitive level of
community (Robson, 1969).

Conceptually the explanation given above is quite sound, but human
moods may not be conceived as purely communal or purely social.
Different degrees of transition between communal and social aspects
are clearly evident in different human groups. Obviously it may
become debatable, for example, whether tribals are communities or
societies. But since they are heavily restricted in translating their
choices into activities, ecological explanations are very well
applicable to them.

Particularly in connection with the tribal human ecology, it should
be remembered that tribal lands are mostly communal property which
they possess with a sense of stewardship. According to the tribal
philosophical outlook and communal viewpoint, a land seldom is a
resource itself, but a set or aggregation of various resources, more
appropriately, a container of resources (Biswas, 1989), that cannot
be exchanged at will if the resources are to be utilised for the
permanent sustainability. In the same sense, land is logically
considered as a natural ecosystem linked eitherway hierarchically
and taxonomically with super-systems and sub-systems having
specific energy balances (Biswas, 1989).

The concept of mature and immature ecosystem is further important.
Energy gained and energy lost are equal in mature ecosystems while
in immature or climacteric ecosystems there is a surplus energy.
Mans early success heavily depended upon his choice or selection
of a niche in an immature ecosystem of which the coastal areas,
estuaries, river valleys, foothills etc. are the best examples. The
nomadic hunters, on this success, became pastoral, the shifting
agriculturists became sedentary and settlement started assuming greater and greater significance in the humanized landscape of the earth (Biswas, 1987). But the human communities, who chose to live in and depend upon the mature ecosystems of forested lands could not grow in number because surplus energy was not available in plenty and ultimately faced the threat of extinction.

Many of these communities came down to foothills from hilltops to compete with other societies, migrated to and fro, to live a submarginal existence. That is precisely what has happened to many tribes in our study area.

Forest lands were very often perceived as human ecological niches for sustainable low level equilibria by tribal communities who tried to reproduce forest edge ecotones in the neighbourhood of their habitations by reducing the forests to scattered small plots interspersed with grasslands, pastures, croplands and other open habitats (Odum, 1959). Creation of a similar pattern by planting trees in open habitats were also tried by the sedentary agriculturists. The concept of forest edge ecotones, therefore, is also relevant to this discussion.

As mentioned earlier, the manner of intervention upon the environmental resource base is conditioned by culture. The concept of community perception of resources, therefore, comes in logically in human ecological discussions. The perceived environment as opposed to the intrinsic quality of the resource base may be regarded as a sub-system (FitzGerald, 1974). Such a sub-system, when completely devoid of change due to absence of outside contact becomes a closed system ultimately producing a steady state ecosystem (Brookfield, 1969).
3.2.0.0 EMPIRIC METHODOLOGICAL QUESTIONS

There are some methodological questions which need to be answered before the area under study can be probed at length. These questions, briefly mentioned in the introductory chapter along with the broader implications of the objectives of the study involve the locational significance of the forests of the area and the association of the forests with the local tribal population in some core areas.

3.2.1.0 LOCATIONAL SIGNIFICANCE OF FORESTS OF SOUTH-WESTERN WEST BENGAL

The forests of south-western West Bengal have some important locational significance which may be explained from physical, economic and socio-political points of view.

The forests, with their space relations, are located on the east-slopping fringe between the eastern portion of Chhotanagpur plateau and the western margin of the Rarh plain. Densely clothed with forests, this valley-hill-plateau complex has been known in common as Jangal Mahal and Jharkhand both meaning "the forested tract" (Jha, 1967). Every forest is naturally rooted on a particular type of land in relation to its hydro-geomorphic and climatic specificities (Mather, 1986). The forests of south-western West Bengal are rooted on the highly metamorphosed and pervious granite-gneiss and schistose rocks (Gaz. Pur., 1985). The tropical deciduous hard-wood species of vegetation is due to its regional location within tropical sub-humid monsoon climate. This type of physical setting along with this type of forest vegetation has resulted in the formation of laterites and red soils (Biswas, 1987).

The most important significance of the location of south-western forests probably lies in the fact that this upland-forest complex consists of a number of catchments or upper basins of some east-
DISTRIBUTION OF FOREST AREAS
IN SOUTH-WESTERN WEST BENGAL
1965

District boundary
Forests

(District names as of 1965.)
DISTRIBUTION OF FOREST AREAS
IN SOUTH WESTERN WEST BENGAL 1984
- AREAS OF INTENSIVE FIELD STUDIES

Forest areas

MAP 3

SOURCE: CALCUTTA PLATE 183
(SECOND EDITION, 1984)
NAT MO, CALCUTTA
Degraded remnants of old forests, scrub and other vegetation clumps

Newly afforested areas (by 1981)

Land below 50m

Land above 50m

MAP 4
flowing monsoonal rivers running through the Rarh plains. They are important in carrying and supplying biogeochemical nutrients from the forest floors to the agricultural fields of eastern plains (Biswas & Panchadhyayi, 1985). The Mayurakshi, Damodar, Darakeshwar, Kasai, Silai and Subarnarekha are such rivers flowing from or through these forested areas.

The dense forests located on the rugged hills and plateau, even in the near past, with the precipitous approaches to the occasional difficult passes, made the country 'a natural fortress' (Jha, 1967) protecting particularly the agriculturally rich Gangetic villages from western invaders like the Marathas and to a long period, the aryanised intruders. As stated by Dalton (1872), "the approaches to it from the north west, east and south, are exceedingly precipitous, the paths winding up defiles which a handful of resolute men could hold against hosts of invaders".

This buffer zone covered with densest forests (Gaz. Pur., 1985) provided a peaceful asylum (Jha, 1967) to a group of indigenous and oldest tribals, from the cradle to the grave, who had a commensal relation with the forests. Probably, for this type of location of forests and freedom-loving warlike tribal inhabitants, the Company had to spend more time and energy to annex this Jangal Mahal compared to other parts of Bengal (Jha, 1967).

Thus the location of these forests had a significant role in and influence on the area itself and the areas lying east of it.

3.2.2.0 TRIBE FOREST ASSOCIATION OF SOUTH-WESTERN WEST BENGAL

The forests and the tribes in this lateritic tract of south-western West Bengal has a readily observable association. This type of locational union is hardly present in other forest areas of West
Bengal. Various records and analyses show that the aboriginal tribes in this tract came to this area in the long past as they were driven out from the forests of central Indian highlands by the aryans and aryans and aryanised high-caste people (Dalton, 1872; Hunter, 1883) and were also driven back by the plains' agriculturists towards plateau-hill-forest complex (Chakraborty, 1982). Still now, this tract has retained a considerable forest cover and tribal inhabitants in several locations, though the original tribal population was much higher in number in the dead past. The people in this area now exhibit a variety of associations beginning from forest-covered hills to the cultivated river valleys, though essentially it was a hill-plateau-forest complex in the past. The inhabitants of this area now are largely composed of people belonging to the Hindu caste system, while the tribals constitute only about 19 percent of the total population in general. Yet, tribals not only form a significant minority of the people, they also have constituted the majority in some pockets, for example, Bundwan police station of Puruliya district, Jhargram police station of Medinipur district and in a few other areas.

3.2.3.0 IDENTIFICATION OF THE TRIBE-FOREST CORES

The principal methodological start to the enquiry has been derived from the assumptions that the tribals and forests shared identical locations in the past and that the present areas of concentration of both the phenomena are the residual areas of deforestation led by the non-tribal entrants in the original human ecosystem. Based on the above assumptions we have compared two sets of maps, one showing the relative incidence of tribals in the total population and the other describing the distribution of forests.

The map of distribution of tribals has been prepared on the basis of police station level census information showing tribals as percentage of total population. These data have been put to the
CORE AREAS OF TRIBAL CONCENTRATION

SOUTH-WESTERN WEST BENGAL

1991

MAP 5

Tribal Blocks

Isolines of Tribals as % of rural population

20 10 0 20 40 KM
centroid of each police station and isolines have been drawn at regular intervals. For the sake of convenience we may call these isopleths isotribal lines. West Bengal on an average has only 5.63 percent of its population in the category of scheduled tribes. If we take the 5 or 6 percent isotribal line as the outer limit of the area having some tribal significance then the whole area under study emerges as an area of such significance. However, our aim is not to consider a disproportionately large area on the rather unsound basis of only the state average which itself is very low; neither it is our purpose to consider a large undifferentiated area for the purpose of our research.

Our objective is to locate precisely the core areas of tribal concentration if there are any. By 'core area' we mean an area of tribal concentration distinctive from other areas by virtue of the fact that from this area the tribal concentration tapers off on all sides. Since for the convenience of investigation we would like to identify as many cores as possible, the objective in short is to maximize the number of cores by selecting the appropriate isotribal line. Thus if we take the 30 percent isotribal line then we identify four distinct cores. If we go down to the 25 percent isotribal line then only three cores can be identified but the area covered by each will increase. Since the number of the cores decreases we may conveniently reject the 25 percent isotribal line as the limit of the area of tribal significance. On the other hand if we move up to the 35 percent isotribal line then also one of the four cores disappear from the map. Therefore, we may resolve that the 30 percent isotribal line is the appropriate level which helps us to identify the existing tribal cores of the area.

These tribal cores are:

(a) the Santuri core in the north having more than 30 percent of the population in the tribal category;
(b) the Baghmundi-Balarampur core in the west of the area having more than 35 percent of the population in the tribal category;

(c) the Bundwan-Manbazar-Ranibandh-Binpur core in the south-west of the area having more than 50 percent of the population in the tribal category, wherein the Bundwan block forms the centre of the core; and

(d) the Nayagram-Kesiary-Gopiballavpur core in the southern extremity of the area having more than 40 percent of the population in the tribal category.

Based on the directions and gradients of the isotribal lines passing through the area, the entire area may be sub-divided into four distinct parts, just as a hilly area can be subdivided into a number of individual hills or spurs separated by valleys on a contour map.

For the purpose of comparing the map of tribal distribution with that of forests, we have based our observations on two sets of information; information obtained from West Bengal Forests (1965), and the National Atlas (1984). It appears that the area under forests has increased perceptively between 1965 and 1984. The authenticity of this observation can always be challenged particularly in terms of the density of the actual vegetation cover in the areas shown as forests in these two maps. But it can be safely said that such areas include those which have old forests still existent and later devegetated and also those which have new plantations. As we know very well that, except the roadside and canal banks, the new plantation are almost invariably associated with areas which were once forested but lost their vegetation cover at an early date, we can also safely say that the new plantations are also the areas of old forests. Thus it is possible to reconstruct a map of the original forest cover existing before relatively modern forces of deforestation
started working. On a map thus reconstructed it is possible to identify four distinct divisions which are almost co-terminal with the four tribal blocks that we have been able to identify from the examination of the isotribal lines.

The above two sets of maps help us identify two major trends as follows:

(a) there is a gradual thinning out of the tribal share of population away from these isolated pockets which can be called the tribal cores; and

(b) there is a gradual decrease in the forest cover with increasing distance from these cores associated with a systematic change in forest composition; although a particular phase dominates over most of the area.