CHAPTER-7

7.0 ECOTOURISM INFRASTRUCTURE AND SUSTAINABLE LANDUSE PLANNING:

7.1 SUSTAINABLE LAND USE PLANNING: Similar to other land societies, utilization of land and forest resources for nature-based tourism to meet human demands is a common practice in this region. But for the sustenance of the project as well as for the maintenance of environmental stability, the nature of resource utilization needs a sustainable layout. Therefore optimum land and water use planning are essential, where hydrological, pedagogical, and biological resources are simultaneously encompassed. Land use planning is the general term used for a branch of urban planning income passing various disciplines which seek to order and regulate land use in an efficient and ethical way. The government use land use planning to manage the land developments land inside their jurisdictions. I am doing this for the government to use land use planning to manage the development units which can plan for the needs of the community while safeguarding natural resources. Land use/land cover of the solution deceits in developments new relationships between these different spaces. The Jungle Mahals land use economic and social condition in order to selected and approve the best land. It use options often one element of a comprehensive plan. A land use plan provides a vision for the future possibilities of developments in neighborhood districts cities or any defined planning area.

Ecotourism can be viewed as a potential policy to protect natural ecosystems while, at the same time, to promote sustainable local development. Ecotourism is a growing niche market within the larger travel industry, with the potential of being an important sustainable development tool. Identifying and comparing presents potential land uses for different land types that making decisions on land uses types and applying for developments programs and activates. On the basis of these decisions is an activity that are being implemented by the government communities and indusial to organized space.

The Jungle Mahals area Bankura Purulia and Paschim Medinipur are not suitable for agriculture. The maximum number of land are single crops and some percentage of fallow land. This area of Purulia and Bankura maximum undulating land is very suitable for industry. Presently West Bengal Government proposed an industry park site at Gholtore (900 acres) area, for this industry park site road and rail communications are required to develop.

7.1.1 Hydro-geomorphological Analysis: Satellite image, Digital Elevation Model (DEM) of the study area and field survey for soil moisture study, was the basis for hydro geomorphological mapping. As a whole, the region is divided into two broad physiographic divisions i.e. the *Plateau hills* in the northwest such as Purulia, Bankura and the *Pediments* in the south. The top of the hill is comparatively flat and groundwater potentiality is poor. Ponds, streams and rainwater are the main sources of surface water. In dry season wet riverbeds are used for cultivation.

Land excavation, deforestation for road construction and rock crushing surrounding the upper dam created *Badlands* (anthropogenic). *Structural hills* are common at the plateau margins and some detached parts of it standing as *Residual hills* on the pediments. *Stony wastes* are also scattered over the plateau hills. Groundwater potentiality of these geomorphic units is almost nil. *Denuded hill slopes* and *Laterite caps* of the pediment also contain very little amount of groundwater.

Pediment local term *'Tanr'* occurs at the foothills. *'Khowai'* i.e. natural *Badlands* are common in this zone. Groundwater potentiality of this zone is moderate. Tanks, river and rainwater are the main sources of surface water. Further, southward *Buried Pediments* locally called *'Baid'*, and wet infilled valleys called *Kanali* or *Bahal*, have moderate to good groundwater potentiality. Tanks, wells, canals, river and rainwater are available for surface irrigation.

Hydrogeomorphology has been defined as "an interdisciplinary science that focuses on the interaction and linkage of the hydrologic process with landforms or earth materials and the interaction of geomorphic processes with surface and subsurface water in temporal and spatial dimensions. Hydro-geomorphology should be mapping in the required in the tourism infrastructure plan site hydrological stream nearby 100 mt. Here the main river-based tourism plan or project. Main River is Surbarnakha, Kangshaboti, Damodar, Dwarkeswar, Silaboti and their branch river are most important for tourism infrastructure planning project. The study area western part of West Bengal, the area attracted developments interest place is Purulia Ajodhya hill, Panchet hills, Bankura Susunia hill and Belphari Kharajhor mounts are the most significance mountains. Makutmonipur dam one of the hydrological signification sites is Bankura Paschim Medinipur border side Kanshaboti, Kumara River suited at the most federal site. Many structural landforms geological features is Gongoni in Garbetta is one of the geological site tourist points. All those tourist inters plannings are riverside or most important geological site and many riverside area Gopiballavpur, Nayagram and most important tourist points Jomboni block Chikighor in Dulung River.

7.1.2 Soil property Analysis: Jungle Mahals soil is mainly laterite soil. Soil test refers to one more of a wide variety of soil analyses conducted for one of the several possible reasons. Possibly the most widely conducted soil test are those which done to estimate the plants-available concentration of plants nutrients in order to determine fertilizer recommendation in agriculture. The soil is a complex, living, changing and dynamic component of the agroecosystem. It is subject to alteration and can be either degraded or wisely managed. A thorough understanding of the ecology of the soil ecosystem is a key part of designing and managing agro-ecosystems in which the long-term fertility and productive capacity of the soil are maintained or even improved. This understanding begins with knowledge of how soil is formed in a given ecological region and includes the integration of all the components that contribute to the structure and function of the entire soil ecosystem (Gliessman, 1998). A great many biological, chemical and physical factors determine soil quality. By measuring some of these components and determining how they respond to management in an agricultural context is a foundation for assessing the health of the soil can be established.. Also include information about characteristics such as geologic origin, color, and management history. Explain the suitability of the soil for agriculture, and how specific properties of the soil may (should) be improved with inputs or cropping/management practices.

7.1.3 Land Capability Assessment: The terms potentiality, quality, capability and suitability of lands are often confused and misused. Actually, potentiality means latent and existing possibility; quality means nature and character of land attributes; capability denotes ability or qualiy to produce. Whereas suitability means that suits or fits for a particular use. Study of present land use with other attributes of the land and land capability classification is the second stage of this planning. "*Environmental Approach*" is adopted for land capability assessment. In this approach, the capability of land is assessed by taking into account the overall environmental attributes (De & Jana 1994)[56]. The methodology essentially employs overlay analysis of different GIS layers e.g. satellite remote sensing data for present land use study, hydro-geomorphologic map, soil map and natural vegetation map. The priority rank of a micro-watersheds annual range of temperature, the pattern of rainfall and irrigation facilities, slope, shape, sizes, and physiographic position of the micro-watershed and chances of environmental hazards are also played a major role in land capability assessment and optimum land use planning. Land capability assessment is used to identify the potential for

agriculture and non-agriculture land uses. It considers specific requirements of the land use and also identifies potential degradation rakes. It is an important tool in western West Bengal development program system. Land capability assessments are the first step in assessing land suitability for a given use. Suitability considers others factors such as economics infrastructure requirements, labor access, water and energy access, conflicting and complementary land uses, and the policy framework.

7.1.4 Optimum Landuse Planning: To prepare an optimum land use map, the whole region has been planning for tourist infrastructure. Tourist spots where high potential zone (first priority) regions are allotted for immediate reforestation and forest-based tourist practices and scientific nature-based practices are recommended for potential zones.

Optimum land use planning is very use full in the Jungle Mahals tourism industry in Bankura, Purulia and Paschim Medinipur District. Large numbers of the area are not suitable for agriculture. New investment of industrial Planning incrised socio-econoic activities. Due to urbanization pressure and industrialization highly protecting of the Eco-sensitive zone. Optimum lands are used to agriculture, eco-sensitive zone, rural developments, industrialization, urbanization, social infrastructure, physical infrastructure, economic growth, resource creation, water body, rural-urban integration, disaster mitigation. (Figure 7.1)

7.1.5 Forestation and Environmental Stability: Sustainable nature tourism is very close to ecotourism but does not meet all the criteria of true ecotourism. For example, a car carrying visitors through the forest canopy may generate benefits for conservation and educate visitors, but because it represents a high degree of mechanization and subsequently creates a wall between the visitor and the natural environment, it would be inappropriate to describe as an ecotourism initiative. In altered and heavily-visited areas, sustainable nature tourism may be an appropriate activity. For example, larger “eco” resort development would not be considered the low impact if it required significant clearing of native vegetation but may contribute to conservation financially and provide conservation education. The line between sustainable nature tourism and ecotourism is delicate but very important.

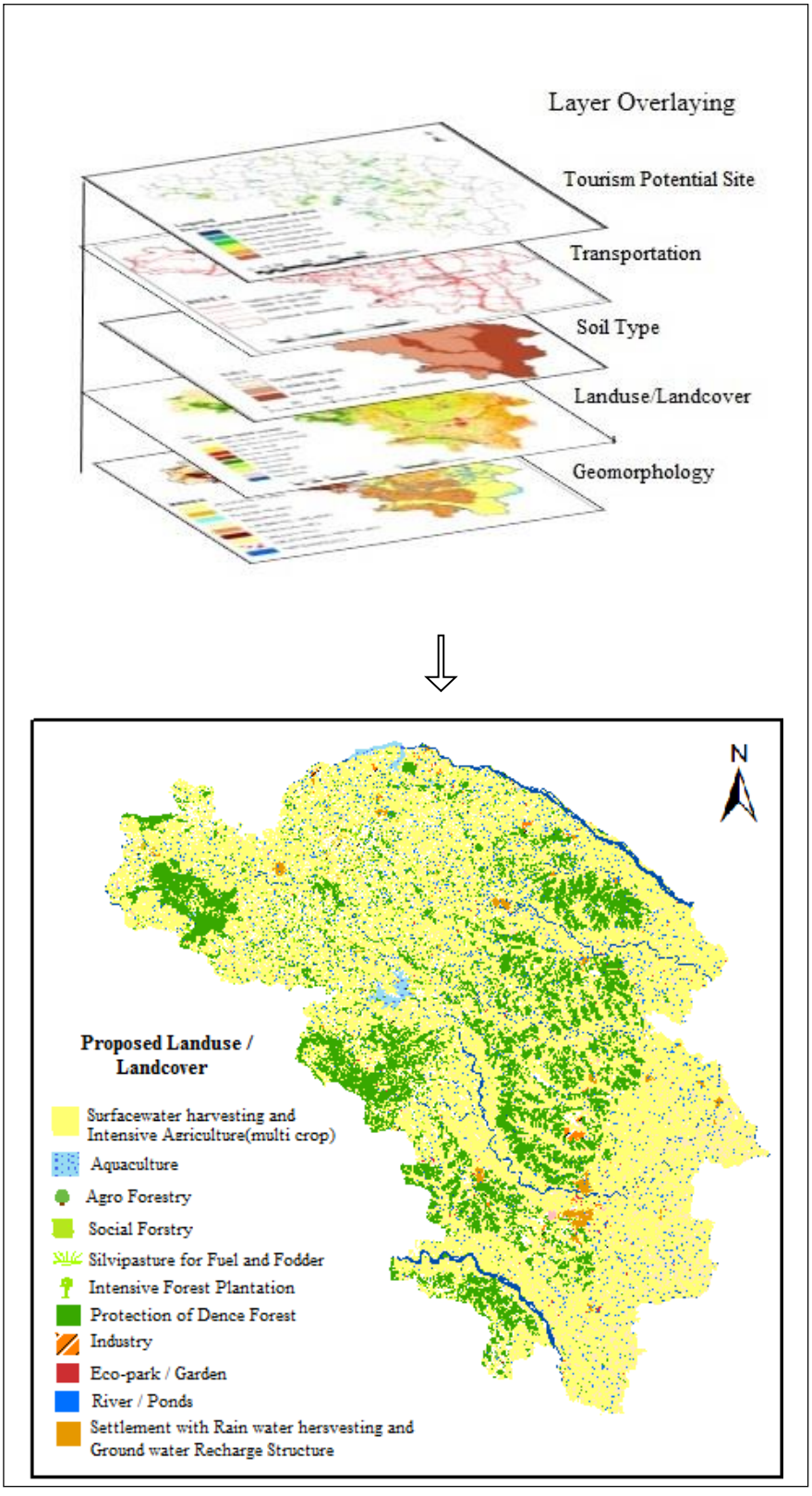

Figure 7.1: Optimum Landuse Planning Map

Sustainability is not an option but very important, for a better world to live in. We need good air, pure water, nutritious food, healthy environment and greenery around us. Without sustainability environmental deterioration and economic decline will be feeding on each other leading to poverty, pollution, poor health, political upheaval and unrest. The environment is not to be seen as a stand-alone concern. It cuts across all sectors of development. The rapid increase in greenhouse gases in the atmosphere leads to, land degradation, increasing floods and droughts, deforestation, loss of biodiversity and environmental pollution that become subjects of serious global anxiety. The overall impact of these phenomena is likely to result in depletion of the ozone layer, change of climate, the rise in sea-level, loss of natural resources, reduction in their productivity which ultimately lead to an ecological crisis, affect livelihood options for development and an overall deterioration in the quality of life. Development based on the utilization of natural resources, the pressure of population and their growing demands and poverty of the people took a heavy charge of our environmental assets. While natural assets have shrunk, demands have grown resulting in over rowels being unsustainable. We have to improve our economic growth rate, provide basic minimum life support services to a large section of our population and deal with the problems of poverty and unemployment. At the same time, we have to pay attention to conserving our natural resources and also improving the status of our environment. We need to tackle environmental degradation in a holistic manner in order to ensure both economic and Environmental Sustainability. This is a most challenging mission for the country and in particular for our planners and policymakers today. Forests play an important role in environmental and economic sustainability. They provide numerous goods and services and maintain life support systems essential for life on earth.

Some of these life support systems of major economic and environmental importance are:

(i) Supply of timber, fuelwood, fodder, and a wide range of non-wood products;

(ii) The natural habitat for bio-diversity and repository of genetic wealth;

(iii) Provision of recreation and opportunity for ecotourism;

(iv) Playing an integral part of the watershed to regulate the water regime, conserve soil, and Control floods.

(v) Carbon sequestration and carbon sink.

Despite significant resource flows and national concern, the potential of forests to reduce poverty, realize economic growth, and their contribution to the local and global environment has not been fully realized. A combination of market and institutional failures

has led to forests failing to contribute as significantly to rural incomes and poverty alleviation and economic growth as would be possible under good economic and technical management. The following advantages are required for forestation and environmental stability:

A. **Natural Forest**: Good forest areas must be brought under scientific management to improve, productivity, density and health. There has been insufficient investment in the management of good forests in the last two decades. Forestry projects should lay emphasis on management and innovation of natural forests in this Jungle Mahals area. The government should try forest plantation, forestation of many areas for environmental stability.

B. **NTFP and Medicinal Plants Development:** The following initiatives are necessary for the development of Non-Timber Forest Produce (NTFP) including bamboo and medicinal plants. In situ conservation of medicinal plants is to be done in the protected areas such as sanctuary, national park, biosphere reserve etc. This area Arabari, Kalaboni medical plants and Chilkigarh medical plants in Paschim Medinipur area are developed. Always 10.36 % among the total tribal in population area in this area ethnic- medicinal practice is very common in the area, mainly Santal, Lohar, Lodha, Kurmi, and Saber tribal group in Jungle Mahals areas. Natural forests rich in medicinal plants should be identified and managed for a sustainable supply of crude drugs under scientific management. Areas likely to flower gregariously during the Tenth Plan should be harvested after the formulation of emergency working plans. Bamboo products like bamboo laminates, bamboo mat board, bamboo mat-roofing sheets, etc. should substitute wood. Nontimber forest produce will be properly regenerated, harvested, processed and marketed for improving the economy of forest-dwellers.

C. **Forest Protection:** Forest protection is also most perfectible forestation and environmental stability for the forest. Several areas in Jungle Mahal such as Arabari, Hijli forest conservation area, Simlapal, Prikibera and Kuilapal, Bhalopahar, Bornti, Sutan are forest plantation of this area. It should include all components of protection and sustainable management of forests such as forest fire control measures, working plan preparation, survey and demarcation, infrastructure development, etc. During the Tenth Plan, it is proposed to give a thrust to this aspect of forest development.

D. **Forest-Based Industries**: Wood-based industries are not efficient due to technological obsolescence, inappropriate machinery, maintenance, unskilled manpower and poor quality of products. Such industries have to be modernized in order to be economically

viable. Initiatives for the modernization of technology, reduction and recycling of waste, and regulations regarding the use of seasoned and treated material, promotion of standards and codes for wood products, etc. will be encouraged**.**

E. **Forest Plantations:** The plantation strategy should be based on creating new forest resources that help reduce pressure on natural forests and preferably reverse the negative impact of deforestation while meeting the increasing demand. India can benefit from the experience of other countries, which have developed policies and incentives to promote private sector participation in accelerating the pace of aforestation. Forest plantation is the major part for the forestation and environmental stability.

F. **Joint Forest Management:** Suitable forest patches are entrusted to well define user groups with a transparent Memorandum of Understanding (MoU) on roles and responsibilities of JFM Committees and the Forest Department in the Jungle Mahals area.

G. **Agro-Forestry Development:** In Jungle Mahal area Commercial agro-forestry should be practiced in areas where irrigation is available. The preferred species should be acacia biotic, bamboo species, casuarinas, folia, eucalyptus species, populous deltoids and prosodies cineraria depending upon agro-climatic and high-tech modern nurseries to be established on a catchment area basis provide quality planting material.

7.2 ACTION PLAN FOR INDIVIDUAL VILLAGES: Digitized mouza / village maps on the ultimately sustainable land and water use map and suitable land use along with crop association are assigned. Thus cadastral level action plan map is prepared for three (3) mouzas or potential tourist place covering the middle part of the study area.

To prepare an optimum land use map of an eco-friendly tourist spot, as a sample three different villages of different districts has been taken due to unavailable of mouza / village maps. The areas are Barabazar CT (A and B), Barabazar block, Srirampur village (C and D), Baghmundi block of Purulia district and Baramsol village (E and F) and Binpur II block of Paschim Medinipur district. The existing land use is mainly dominated by cultivable land, forest, a forest plantation, settlement and scrubland open. To visit more tourists I recommend few changes which are like cultivable land should be intensive agriculture land (multi and double crop), the natural forest should be protected, forest plantation should be more intensive, eco-park or garden should be situated near the forest and water body zone. Tourist cottage, car parking zoon, aquaculture, and social forestry, solid waste treatment plants for sanitary are some options which can help the ecotourism business. (Figure 7.2)

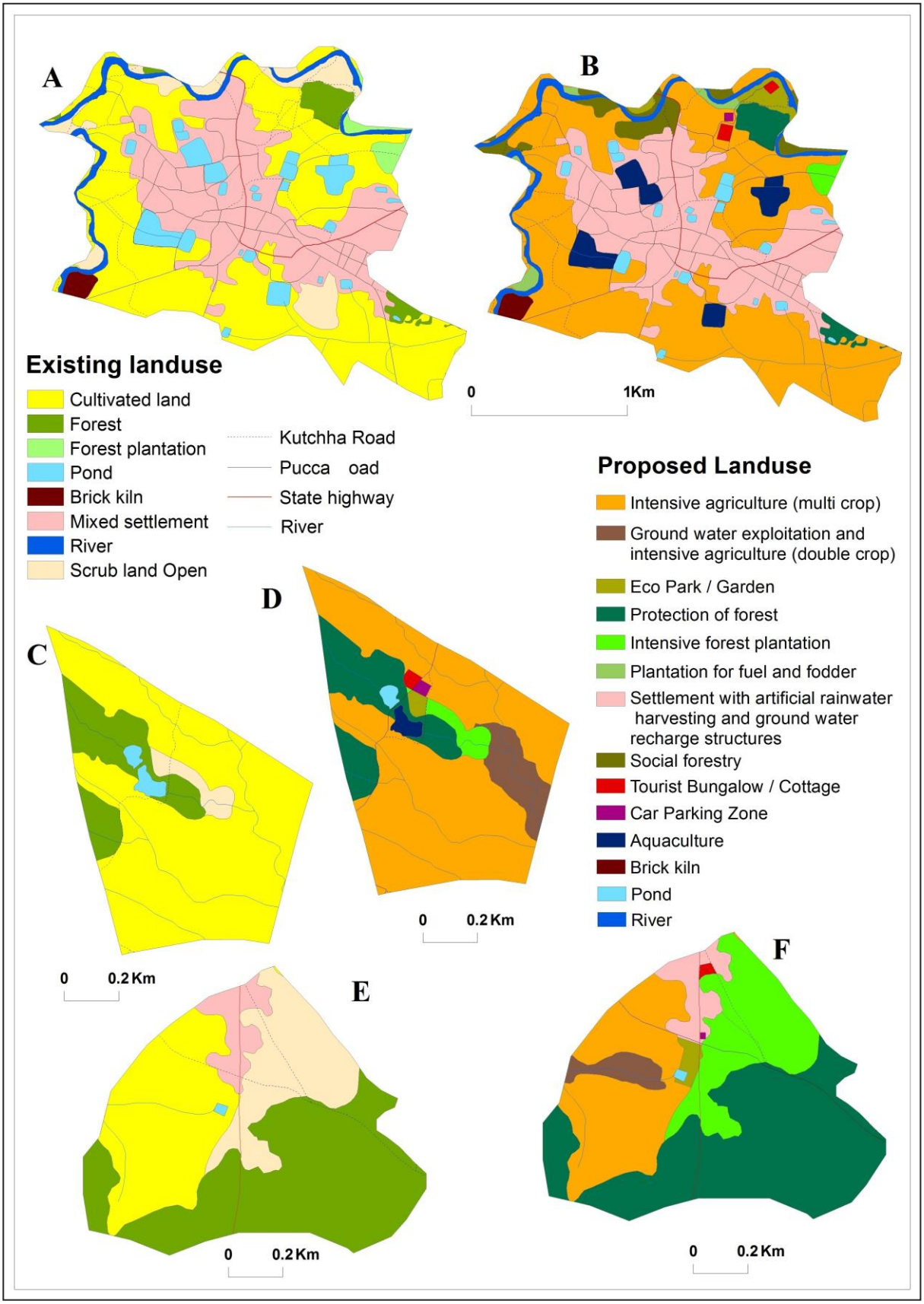

Figure 7.2: A) Existing Landuse B) Proposed Landuse of Barabazar village (CT).
C) Existing Land use D) Proposed Landuse of Srirampur village (JL No. - 139).
E) Existing Landuse F) Proposed Landuse of Baramsol village Binpur II (JL No. - 271).

7.2.1 Information Extraction Procedure for users: These action plan maps are advised to be used in digital format but also could be published in hard copy for computer illiterate people, where the potential tourist place and it's existing and future tourist place are to be provided separately. Arc Gis10.3 is used for village level land use mapping. These action plan maps are identical with cadastral maps, and plot numbers are visible as Labels.

7.2.2 Planning for Ecotourism Related Infrastructure: The ecotourism planning can be done which can bring the development of the underdevelopment backlog tribal people of Jungle Mahal and seditious activity prone area by employing the local people as well as by infrastructure development. Ecotourism is truly a form of environmentally conscious tourism and only pursuits of remote, pristine locations but also it can be sustainable with the continuous capacity to safeguard the natural environment as the very basis of tourism attraction. It should also provide and maintain the quality of tourist experience and satisfaction as well as a benefit to the local people in this area:

Ecotourism is increasingly being advanced as a strategy to help address economic and social problems in local communities and as an appropriate and effective tool of environmental conservation. The full and effective participation of local communities in the planning and management of ecotourism is, however, rarely a feature of ecotourism projects. At best, ecotourism projects tend to aim for the involvement of local people, and at worst, ecotourism projects can ignore the issue of local participation completely. Such projects frequently fail after a relatively short period of time.

Therefore following strategies could be adopted to involve local people in ecotourism planning and management in the Jungle Mahals area. There are some guidelines following needed to fulfill this purpose, which are:

- Sustainable development of ecotourism requires the balance between three elements the tourists, local people and the host community. Therefore, a management level Government should involve local people along with NGO and private organization.
- Involvement of local administration (e.g. Gram Panchayet) in the selection of a site for ecotourism development.
- Generally, the ecotourism destination is developed in the eco-fragile area, which has time specific attraction. The duration of visit and activity pattern of the tourist should be decided by implementing authorizes to maintain natural harmony.
- Social forestry and Participatory Forest Management (PFM) in the site to rejuvenate the degraded forests and encourage wildlife tourism

- Conservation and management of community/government degraded forests in lieu of usufruct right of fuelwood, fodder and non-timber forest products (NTFP).
- All the employees of the hotels/guesthouses from manager to housekeeper should be local people and the employment of women are also encouraged.
- Employing aged and experienced people as guides in local tours and forest safari and as night guards in the hotels and camping grounds.
- Formation of co-operative societies to produce agro-horticultural and animal products in the prescribed lands and run the canteen/restaurants in the tourist spots through those.
- Providing training and pieces of equipment to the local clubs/associations to develop mountaineering institutes for tourists.
- To create a suitable eco-tourism destination it is very essential to make the place peaceful from deadly mus activity engaging the tribal people in much creative and developmental activity by giving them proper study and training.
- Along with this, there is also a need for publicity and advertisement of ecotourism destinations, Environmental group accreditation (tour operator) and adequate funding to maintain the environmental quality of the potential ecotourism destinations.
- Encouraging folk cultures by including them in tour packages (e.g. Chhau dance, Santal dance in guesthouses).
- Providing loans to local youths to purchase eco-friendly vehicles for tourist transportation and tour operation.
- Tourist cottages/rest house, green hotels and restaurants, public convenience facilities, Tourist Information Centre, conveyance facilities, Tourist guide map, public convenience facilities, Detail map of ecotourism destination. Tourist circuit maps to show it's like to another place of tourist interest, Do and don’t board, medical aid facilities, communication facilities etc are to be developed.
- In the action area, there is a lack of approach road to visit this place. For this purpose few non-metallic roads has been designed as a loop, which can be utilized by tourists as trail walk along the dense and open forest zone.
- Communication facilities like’ bus service, telecommunications service etc which are now existing these have to be modified.
- It is very essential to highlight about the infrastructural development in existing and future eco-tourism spot in national and international level.
- Improve water supply system for the demand of water different purpose.

- Develop Sewage collection & treatment system.
- Built up Power generation and consumption System.

Proper ecotourism management, legislation and environmental measures should be framed and along with this strict enforcement measures should be imposed at eco-destination. Along with this, there is also a need of publicity and advertisement of ecotourism destinations, Environmental group accreditation (tour operator) and adequate funding to maintain the environmental quality of the potential ecotourism destinations

7.3 SECURITY RESTRUCTURING IN RELATION TO TOURISM SITE

Safety and security of tourists is the principal importance of any country as it majorly impacts the arrival of foreign tourists in the country. As per the World Economic Forum's T&T Competitiveness Report 2013, India holds special significance which has been ranked at a low level of 74 amongst 140 global economies on safety and security parameters. Planning for security-related infrastructure is very important, so it helps developments for eco-tourism. The ecotourism planning could be done which can bring the development of this underdeveloped area by employing the local people as well as by infrastructure development. Ecotourism has to be truly a form of environmentally mindful tourism and not just pursuit of remote pristine locations. It can be made sustainable with the continuous capacity to safeguard the natural environment as the very basis of tourism attraction (Ram Swami, 2006)

The government has prepared concerted efforts towards increasing the safety and security of tourists in India. One of the primary actions in this direction includes setting up of special tourist police.

7.3.1 Digital Base Map:

GIS can be used to store and display data needed as base map data for the military applications showing contours, transportation routes and cities. GIS is used by the military to aid their understanding of regional terrain and how it affects overall battlefield support. Satellite imagery and GIS terrain data can give information about potential landing site analysis, vehicular travel time, the field of view and line of the site assessment. These data can create a more realistic rendition of the area while clarifying specific features needed for navigation. These digital maps provide a commander in the field with state-of-the-art technology that can identify a position, interrogate that position for access to water, fuel,

cover and parking for vehicles, determine areas of visibility to the enemy and assess its strength and develop strategies accordingly. Most likely users of GIS are viewers. There is personnel right from field commanders to command staff. They need access to a geographic picture, map or photograph to help and assess a situation to carry out planned operations. This study area is a hilly region such as Ajodha hill, Belpahari or forest cover area geographical mapping are very important for the GIS application. This map help concept for the affected Maoist movement area that helps the police and joint forces. Positioned the Maoist activity places and detail of forest map, activity village map such as more active place Jhargram, Jomboni, Silda, Belpahari, Ajodhya, Asra, Balarampur, Simlapal, Bandwan, Lalghar. Nayagram area is the border of Jharkhand and Odisha, state forest cover and terrain mapping are also very useful for position information.

7.3.2 Data Updating:

The updated map or data information is a must for the police and joint force. The increased availability of proper information to be provided by high-resolution satellite image will first and foremost use for police intelligence. This is a sobering reminder of the importance of accurate spatial information in battlefield information management.

7.3.3 Weather Information

Weather information is also very important for the military troop during the wartime. They need very timely information about the significant climate changes, where GIS can effectively help. Reliable navigation and timekeeping aids are good weather forecasts for about any part of the world. Weather plays a dominant role in the frontline. Real-time weather information is essential for field commanders either on land or in the sea or air for successful completion of the duty. At times, the weather may play a crucial role in the success or failure of an operation. Every battlefield commander would like to know the information regarding cloud coverage, wind conditions, visibility, temperature parameters and other related inputs.

7.3.4 The GIS System:

The computer-based Geographical Information Systems (GIS) can provide computerized support to armed forces terrain analysis function. However, these software Systems and utilities have limitations, as they are not full-featured GIS. The greatest

limitation is the user's ingenuity. These systems have the capability to receive, reformat, generate, store, retrieve, update, manipulate and condense digital terrain data to produce terrain analysis products such as modified combined obstacle overlays, slope maps, on and off-road mobility maps, disguise map sand possible problems associated lines of communication.

7.3.5 Positional Information:

One of the most significant functions of GIS along with satellite imagery is to understand the terrain, which is a major role in determining how groups can be arranged in the quickest and most efficient way. Understanding the site is particularly useful because a military leader can determine strategic positions, such as ideal locations for scouting parties, the best line of sight/fire and also the ability to hide groups and equipment. GIS creations a vital role in military logistics because it helps in moving supplies, equipment, and troops where they are needed at the right time and place. By using GIS in determining routes for convoys, forces are able to determine alternative routes if mishaps or traffic jams occur on the most direct route. Using GPS and GIS certain sensitive articles such as; nuclear warheads can be chased every step of their shipment and also kept away from hot spots, working areas or other shipments.

7.3.6 Security for Tourist:

For West Bengal Police, many new Police stations have been created in 2013-2014 and have been made functional. Address the problem of crime against women; the government has decided to set up 65 women police stations in a phased manner. 10 women police stations were set up in 2011-2012. In the year 2013-2014, ten more such police stations have started functioning. To be known as "tourist police," the force will work in tandem with the tourism department and the state police. Volunteers will be rented, who will be paid by the department. The state will also provide them with radio sets and vehicles. They will be trained by the officials of Kolkata and other towns.

There would need to set up some police outpost or camps for security and control law and order. At Panchet hills in Neturia block, there is a need of camp/outpost. In Bandwan block which is a border area of West Bengal require police post or camp at Kuilapal and Phalopahar tourist zone. There is one police station at Bandwan village. In Paschim

Medinipur there also need to establish or rearrange of police camp/outpost at Chilkighar in Jambani Block, and another outpost/camp required at Topoban in Nayagram block.

7.3.7 Traffic Management and Setting up Road Blocks

There would be a need to divert traffic away from the scene of incidence as well as the need to prevent the miscreants from receiving away. GIS can importantly support analyzing the surface and subsurface communication available in the given area to manage this aspect effectively. Getting the things timely, safely and efficiently at the battlefield is one of the biggest problems of the force. Hence the transportation is tapped into GIS technology to keep information about highways, bridges, traffic patterns, installations and seaports at its fingertips. Digital maps of primary and secondary roads could play a serious role in the event of an accident and drivers block a highway must find alternate routes. GIS can greatly enhance the intelligence base for strategic planning as well as for peacetime operations.

A Temporary Traffic Management Plan shall be completed where road works require temporary traffic management. Temporary Traffic Management Plans provide a means of planning and implementing the traffic management arrangements that ensure the safety of road workers and determine the manner in which all likely road users are safely and efficiently conveyed through a road works site. Temporary Traffic Management Plans are strategic and normally form part of a project's Preliminary Safety and Health Plan. The Temporary Traffic Management Plan should be in proportion to the scale and complexity of the project being undertaken. Temporary Traffic Management Plans can, vary from readily recognized layouts to extremely intricate designs. It helps for the GIS application traffic mapping and joint force for Jungle areas force bus, police van, and land mine van. It easily reaches the actual ground 0 points with the help of GIS application networking analysis mapping. GIS can helps findout the traffic routs for Joint force to quick reach the Maoist attacked place, fighting the Maoist cadre.

- Consider training taxis and other disadvantaged transport operators in order to enhance their services and allow them to play an important role in the tourism industry.
- Encourage entrepreneurship in the provision of transportation services.
- Improve standards and quality control among all forms of transportation.
- Improve the suggestions and coordination among different forms of transportation.
- Encourage more open competition.

- Consider the safety and standards of ground transportation services to satisfy the requirements of tourists (domestic and international).
- Collaborate closely with the Department of Transport to improve ground transportation services for both the domestic and international tourism industry and eliminate restricted access that may arise.
- Consider the formation of a Tourism Transportation working group to address and coordinate all issues of mutual interest

7.3.8 Coordination of Resources for Medical Support and Rescue Work

Data about the accessibility of medical facilities in the neighborhood of the scene of incidence will greatly assist in quicker reaction time. Further, the ability to track ambulances, locate health workers and doctors and blood banks can ensure well medical support. It is also extremely important that people carrying out rescue are not unduly endangered. Use of GIS can assist in analyzing structural damages, collateral damages, and other inputs which could assist in relief efforts.

This section provides a summary of the key issues that duty holders should consider in order ensuring compliance with safety and health legislation. It concentrates on the key safety and health issues; however, it is essential that all aspects of safety and health are considered during the design and preparation of a Temporary Traffic Management Plan. Working on live roads carries the potential for high risk. Drivers on these roads may not expect to encounter standing or slow-moving vehicles, pedestrians or people at work. In addition, the workers involved may have limited protection from oncoming traffic. Hence, the work must be managed to ensure that the risks are as low as is reasonably practicable. From a safety and health perspective, road works can present a high risk unless adequate precautions are taken to ensure that the traveling public is adequately warned and informed. While the potential consequence of an accident on heavily transferred high-speed roads is more severe, the risks involved in working on other roads must not be disregarded. Such roads will frequently fail to meet current sight distance requirements and design standards.

7.4 SUGGESTION FOR PACKAGE TOUR

Jungle Mahal area (three district Bankura, Purulia and Paschim Medinipur) located in the western part of West Bengal. This area is one of the most popular tourist destinations of the West Bengal. Jungle Mahal's Kharagpur and Adra Divisions are one of the major railways and roadways junctions in West Bengal. These areas are well connected to all the other parts of the region. The main station points of those tour package base station Jhargram town. How to reach to Jhargram or Purulia the most important means of transport network detailed given below.

How to Reach Jungle Mahal area:

By Rail:

Jhargram railway station is deemed as one of the important stations in of West Bengal. There are direct trains that connect Jhargram to all the other regions in India, including Tata, and Kolkata. The area is also well connected to Asansol, Chakradharpur, Burdwan and Kharagpur as all the long distance trains stop here.

Table:- 7.1 Time table of Trains

ACCESSIBILITY OF JHARGRAM FROM VARIOUS PARTS OF INDIA BY TRAIN	
From Kolkata (Howrah)	From (Tata)
(12871) Ispat super first Ex,(9:10 AM) (68001)Satragachi Passenger (9:30AM)	(12814)Steel super first Ex(7:30AM) (18029)SHM LIT Kurla Ex(8:40AM)

(Source: Administrative Website of the time table of Indian railways board)

By Roads:

Jungle Mahal area Jhargram is well connected to the other districts and regions in West Bengal through roadways. There are regular bus services and cab facilities that link Purulia to the neighboring cities, including Kolkata, Orissa, Digha, Krishnanagar, Bardhaman, Asansol, Chakradharpur, Malda and Berhampur, Tata. The National Highway – 32 and National Highway – 60 National Highway 6 pass through the District. SBSTC, CSTC buses and many private operated buses run between Kolkata / Tata / Ranchi and others India location.

- **Suggestion for Package tourism plan of Jungle Mahal area (Bankura Purulia &Paschim Medinipur) and adjoining area**

Jungle Mahal offers tourists not just places of religious and cultural interest but also sites wherein one can have fun and frolic. The place is also famous for its fresh water springs, stream and natural beauty forest cover.

7.4.1 Yellow Line: (for 2 days package)

Day- 1. From Kolkata to Jhargram by train Ispat Super First Express (12871) reached Jhargram station at 9.10 a.m.

Jhargram Station to Jhargram Rajbari Tourist complex halt rest 2 hours. Attracting places are Hatibari (40km) site tour Kuthighat, Jhilibandh, Rameswar, Topoban, Nayagram, than Dantan, Moghalmari, Narayangarh (22km) back to Chilkigarh (Kanakdurga temple), Kendua back to Jhargram Rajbari tourist complex 1-night halt.

Day -2 Jhargram to site visit (Eco Tourism center& Tribal Museum, Medical Plants Garden (Kalaboni), Sabitri Temple, Jhargram Mini Zoo, Jhargram Rajbari, Bahirgram, Belpahari(27km) Ghagra Water Falls- Lal- Kandha Rani Lake, Tarafeni, Gurasini, The spring of Ketki, Kankrajhore reached to Jhargram Station for back Kolkata / Tata .

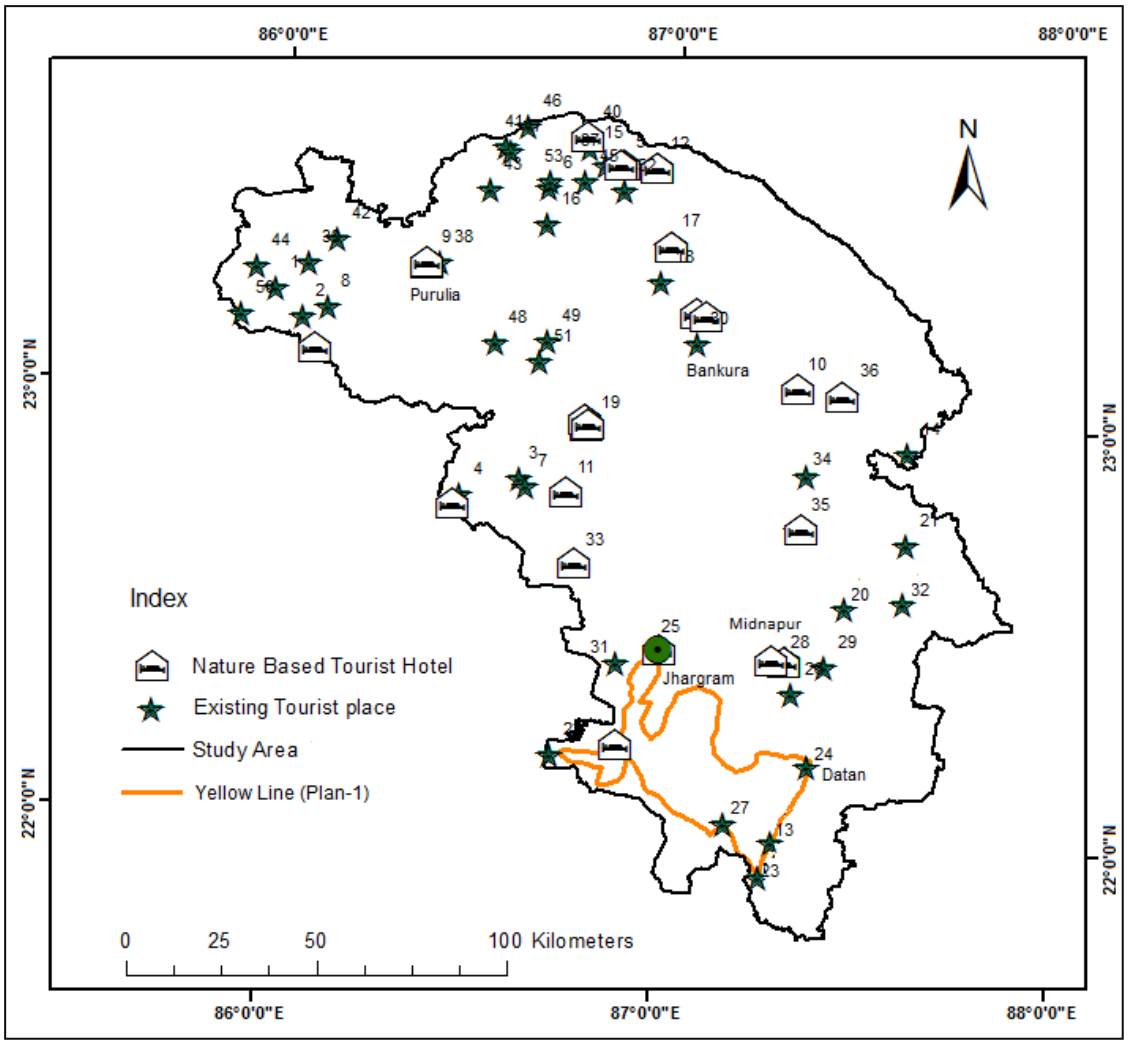

Figure 7.3: Tour Plan Yellow Line (for 2 days package)

7.4.2 Blue Line: (for 3 days package)

Day – 1 Reached Jhargram by train Ispat Super First Express (12871) from Kolkata to Jhargram or Steel super first Express (12814) from Tata to Jhargram.

Visit Jhargram town area and side visit Eco Tourism center& Tribal Museum, Jhargram Mini Zoo, Jhargram Rajbari, Medical Plants Garden (Kalaboni), Sabitri Temple, and Bahirgram (10km), Belpahari forest, Ghagra Water Falls- Lal- Kandha Rani Lake, Tarafeni, Gurasini, The spring of Ketki, Kankrajhore and Sutan (19km), Jhilimili Forest, Kuilapul(2km), Bhalopahar (15km) and Night Halt at Jhilimili.

Day -2 Jhilimili to Mukutmonipur (25km), Budhpur(21km), Pakhbir(5 km), Matha, Baghmundi(45km), Ajodhya, Khairbera(14km), Suisa(10km), and Night Halt in Ajodhya.

Day -3 Ajodhya to Kakidam(20km), Murguma (14km), Deulghata (10km), Purulia(24km) Surulia(3km).

Back to Kolkata CKP Howrah Passenger Departure at 8.00 pm from Purulia

Alternatively, Rupasi Bangla Express Departure 3.25 pm from Purulia to Kolkata

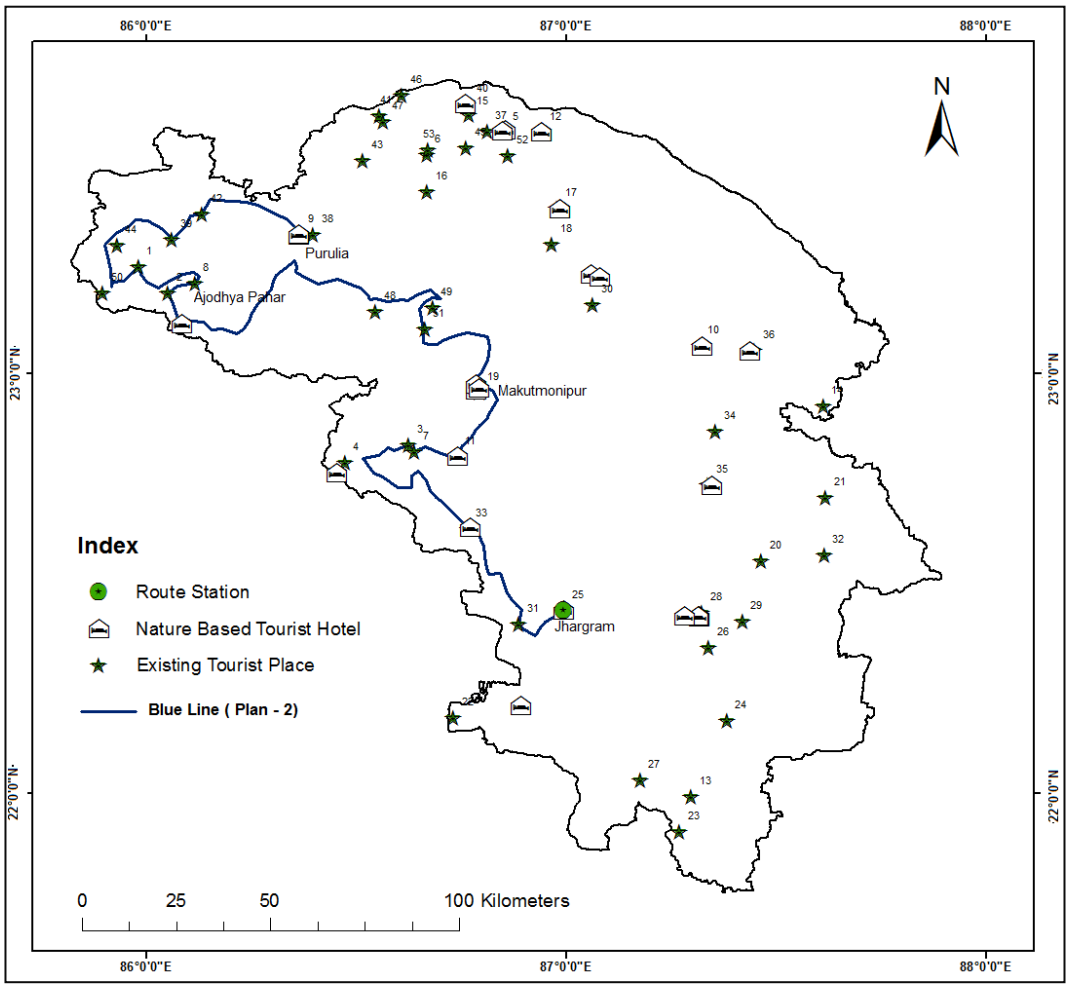

Figure 7.4: Tour Plan Blue Line: (for 3 days package)

7.4.3 Green Line: (for 4 days package)

Day – 1 Reached Jhargram by train Ispat super first Express (12871) from Kolkata to Jhargram or Steel super first Express (12814) from Tata to Jhargram.

Visit Jhargram town area and side visit Eco Tourism center & Tribal Museum, Medical Plants Garden (Kalaboni), Sabitri Temple, Jhargram Mini Zoo, Jhargram Rajbari. Jhargram to Malancha, (35km), Midnapur town (15km), Phatra (10km), Keshpur (18 km), Narajole (12km), Khirpai (14km), Chandrakona road (28km), Garhbeta (15km) 1-night halt at Midnapore town or Garhbeta.

Day – 2 Garhbeta to Kamarpukur (25km), Joypur (23 km), Bishnupur (14km), Bankura (28km), Chatna (23km), Susunia (10 km) night halt at Susunia or Bankura.

Day- 3 Susunia to Kahipur (34km)**,** Joy Chandi Pahar (10km), Murradih Irrigation Dam, Ramchandrapur, Ganpur, Baranti (4km) Biharinathpur (9km), Gar Panchkot (12 km), Panchat Pahar (2km). 1 night stay at Gar Panchkot nature based tourist cottage.

Day – 4 Gar Panchkot to Telkupi, Banda (8km), Cheliyama (2km), Para town, Purulia**.**
Back to Kolkata Rupasi Bangla Express Departure 3.25 pm from Purulia to Kolkata
Alternatively, CKP Howrah Passenger Departure at 8.00 pm from Purulia

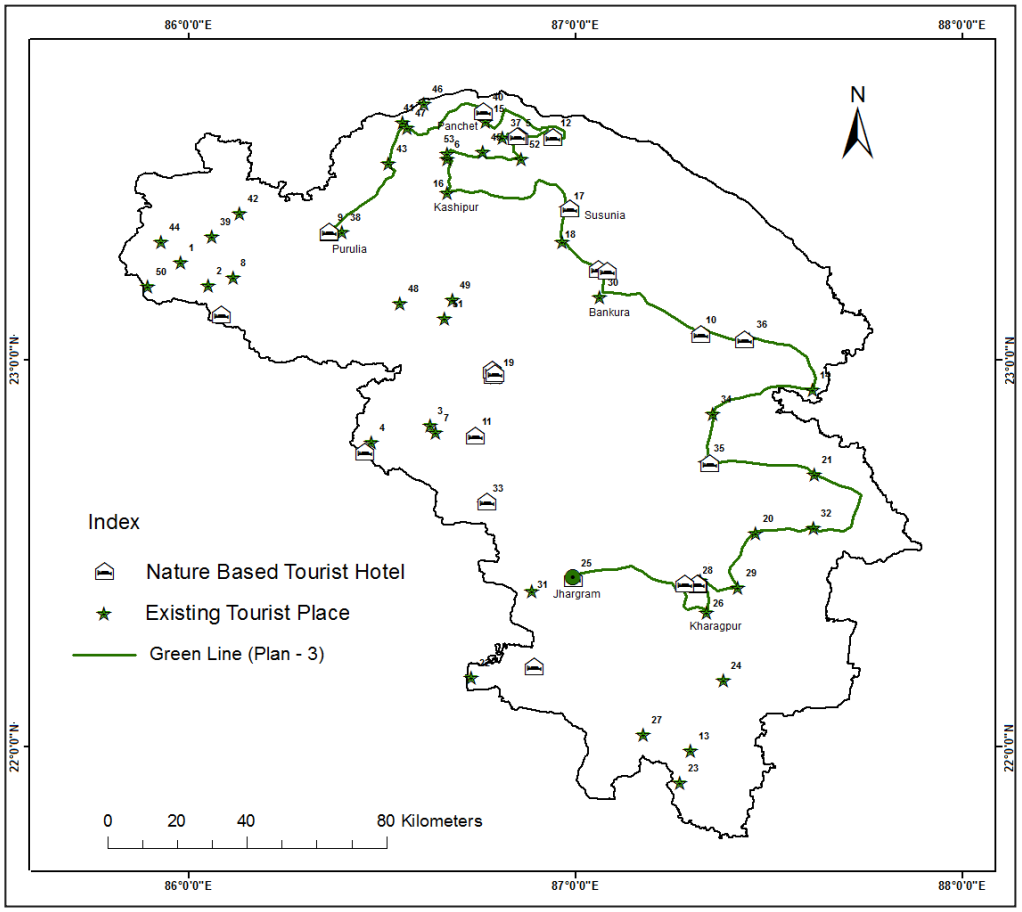

Figure 7.5: Tour Plan Green Line (for 4 days package)

7.4.4 Red Line: (for 6 days package)

Day- I. Reached Jhargram by train Ispat Super First Express (12871) from Kolkata to Jhargram or Steel super first Express (12814) from Tata to Jhargram.

Jhargram rail station to Jhargram Rajbari Tourist Complex halts rest 2-hour. Then start journey towards Hatibari (40km) site tour Kuthighat, Jhilibandh, Rameswar, Topoban, then Nayagram, and Dantan, Moghalmari, Narayangarh back to Jhargram Rajbari tourist complex and site visit Chilkigarh, deer park 1-night halt at Rajbari Tourist Complex.

Day – 2 Jhargram to Malancha, (35km), Midnapur town (15km), Keshpur, Narajole, Khirpai, Chandrakona Road (28km), Garhbeta back to Jhargram or rest at Midnapore town.

Day-3 Jhargram to Bahirgram, Belpahari(27km), Sutan(19km), Jhilimili(10km), Kuilapul(2km), Bhalopahar and Mukutmonipur(25km), night halt at Mukutmonipur.

Day-4 Mukutmonipur to Budhpur (21km), Matha(14km), Baghmundi(45km), Khairbera (14km), Suisa(10km), Ajodhya(4km) and night halt in Ajodhya.

Day-5 Ajodhya to Kakidam, Murguma(14km), Deulghata(10km), Purulia(24km),

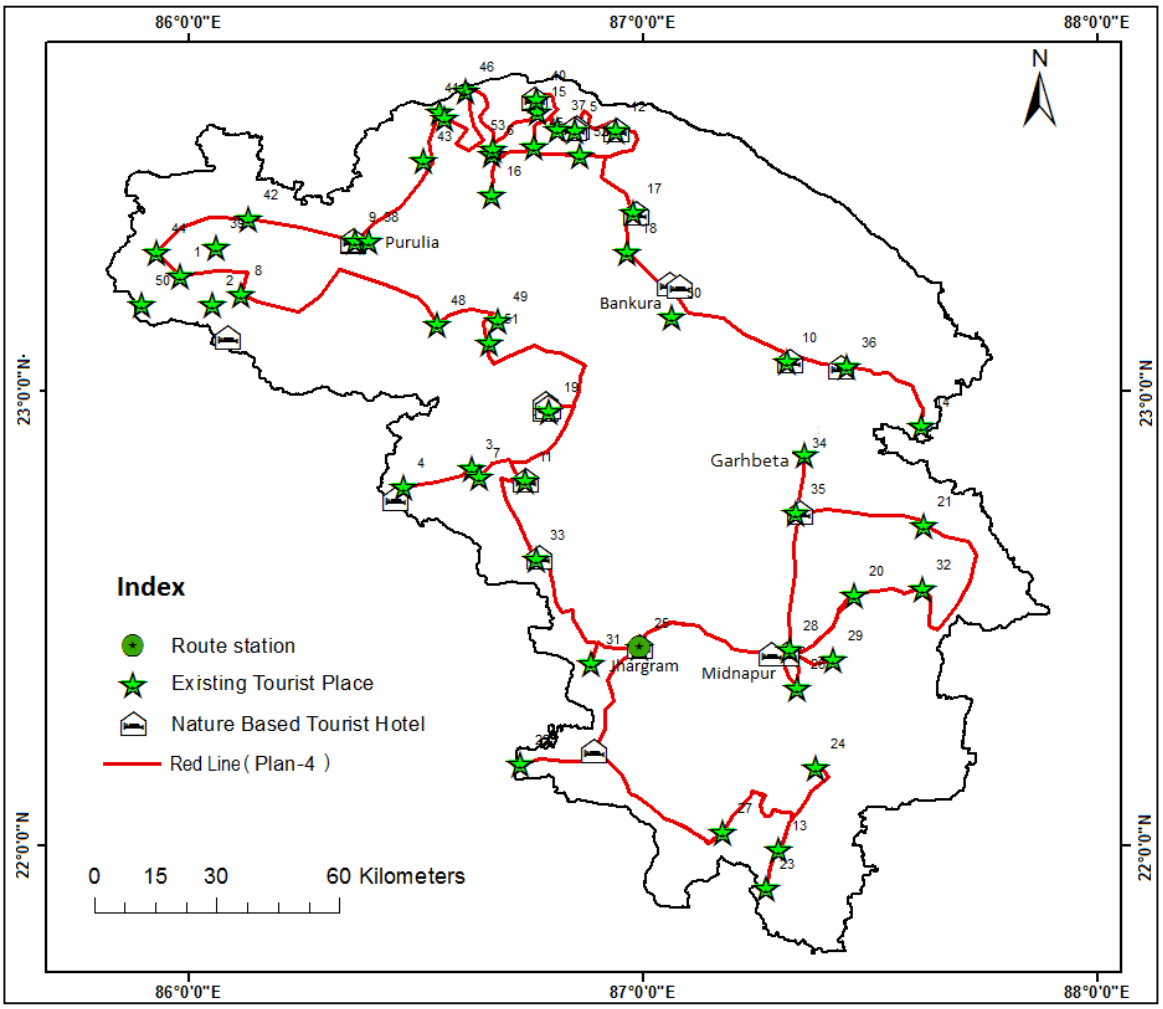

Figure 7.6: Tour Plan Green Red Line (for 6 days package)

Kashipur(29km), Joychandi(16 km), Cheliyama (2km), Telkapi(8 km) Murudhih Irrigation Dam, Banda(13km), Panchat (17 km), Garpanchkot(3 km) night halt at Panchakot.

Day – 6 Garpanchkot to Ramchandrapur (7 km), Biharinath(9km), Ganpur, Susunia(19km), Bankura(18km), Joypur(14km), Jayrambati and Kamarpukur (23km) and go back to Bishnupur Railway station (35 km).

Rupasi Bangla Departure (Bishnupur station) 5.25pm to Kolkata.

Government WBTDC Jungle Mahals Tour Packages

Packages - 1

Kolkata – Jhargraam- Chilikigarh- kanakdurga Temple- Mini Zoo Night Stay at Jhargram Rajbari Tourism project Ghagra Falls Rani Lake Kankrajhor- Kolkata
(1 night 2 Days)

Packages - 2

Kolkata – Bishnupur via Jairmbati – Kamarpukur- Makutmanipur- Kolkata (1 night 2 days)

Packeges – 3

Bishnupur Tour Toursims Centre Bishupurvia Jairambati Kamarpukur- Mukutmanipur- Kolkata (2 Night 3days)