PREPARATION OF ZONAL MASTER PLANS FOR ECO SENSITIVE ZONES: PENCH TIGER RESERVE (INDIRA PRIYADARSHINI PENCH NATIONAL PARK AND MOWGALI PENCH SANCTUARY)




VOLUME 1 – ZONAL MASTER PLAN

Madhya Pradesh Tourism Board, Bhopal

PREPARATION OF ZONAL MASTER PLANS FOR ECO SENSITIVE ZONES: PENCH TIGER RESERVE (INDIRA PRIYADARSHINI PENCH NATIONAL PARK AND MOWGALI PENCH SANCTUARY)

IDENTIFICATION TABLE	
Client/Project owner	Madhya Pradesh Tourism Board, Bhopal
Project	PREPARATION OF ZONAL MASTER PLANS FOR ECO SENSITIVE ZONES: PENCH TIGER RESERVE (INDIRA PRIYADARSHINI PENCH NATIONAL PARK AND MOWGALI PENCH SANCTUARY)
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ABBREVIATION

ESZ	:	Eco-Sensitive Zone
Sq. km	:	Square kilometre
Ha	:	Hectare
FTL	:	Full Tank Level
HFL	:	High Flood Level
GIS	:	Geographical Information System
PTR	:	Pench Tiger Reserve
PA	:	Protected Area Boundary
MoEFCC	:	Ministry of Environment, Forest, and Climate Change
PPH	:	Person Per Hectare
Km	:	Kilometre
MFP	:	Minor Forest Produce
SAI	:	SAI Consulting Engineers Pvt Ltd (SYSTRA Group)

1 PLANNING A GREEN LANDSCAPE

Zonal Master plan and Sub zonal tourism master plan for eco sensitive zone of Pench Tiger Reserve is a visionary document with well-defined aim and objectives.

1.1 THE VISION

To thoroughly study and comprehensively evaluate the far-reaching influence of Eco-Sensitive Zones on regional development, while carefully unfolding a strategic and well-planned approach to disburse or earmark a robust development strategy aimed at promoting sustainable development, thereby significantly boosting socio-economic activities, all while steadfastly ensuring the preservation and conservation of natural habitats and diverse wildlife.

1.2 OBJECTIVES

Objectives are the key components of the master plan to achieve defined aim. The Objectives are classified into two types-

1.2.1 Short-Term Objectives

i. To **provide sustainable Development strategies** for minimizing risk of impact from natural growth of the settlement and other development needs.
   - ✓ To regularize the developmental activities in the eco sensitive zone
   - ✓ Provision of infrastructure facilities for local communities

ii. To **promote Eco-tourism** in Eco Sensitive Zone
   - ✓ To explore and develop Eco-tourism potentials in Eco Sensitive Zone considering
   - ✓ Provision of basic infrastructure facilities on tourist sites as per carrying capacity

The first objective is concerned with development activities in the ESZ. All the 108 notified villages under ESZ will expand in future as per individual needs, so the first objective provides a platform for sustainable strategy for development which will minimize the risk of impact of any developmental activities in the ESZ. Pench Tiger Reserve is rich in terms of biodiversity and natural resources. The second objective focuses on conservation and management of natural resources of Eco Sensitive Zone and promoting sustainable use of the natural resources.

1.2.2 Long-Term Objectives

i. **To prevent depletion of natural resources**
   - ✓ to restrict development which may affect depletion of natural resources through development guidelines and proposed land use
   - ✓ To promote sustainable use of natural resources

ii. To **generate livelihood opportunities** for local communities of Eco Sensitive Zone through community participation and skill development

iii. The third objective concerned about **promotion of eco-tourism activities** in the eco sensitive zone is to create balance between conservation of natural resource and development activities. As a result of promotion of eco-tourism, it will create employment opportunities in various sectors of economy.

2 THE STRATEGIES

The chapter discusses the Existing Land Use Plan, suggested guidelines for development, and proposed areas for Eco-Restoration.

2.1 ECO FRIENDLY LAND USE PLANNING

Landuse landcover has been prepared based on the data received from State IT Department as shown in Annexure 1.2, Chapter 1.2.2, Section 1.2.2.1, Figure 2.1 and Table 2.1. The zonal master Plan for Eco-Sensitive area is supporting the eco-Friendly land use planning (Conservation planning).

2.2 AREAS FOR SUSTAINABLE DEVELOPMENT

All the natural resources like waterbodies, forest etc. are to be conserved by proposing no development zone in the area and surrounding buffer area. Some areas of the forest where tourism activities are allowed, structures like tree cottages and tree houses with minimum disturbance to the nature is permitted. Forest areas where eco-tourism activities, eco cottages and huts are proposed, the cottages should be developed in such a way that it does not harm the nature. Landscape and gardens as well as social forestry can be developed in the areas of eco cottages for beautification and ambiance of the place. Areas where resorts are proposed, and areas considered for future expansion of the settlement area will be developed in a planned way with eco-friendly materials like bamboo, wood, mud etc. and green building concept. Rural settlement and future expansion area will develop based on form-based codes in accordance with suggestive development guidelines. Urban settlements and Rural Settlement Area of villages are generally the most congested and dense areas. Regularized development of Urban areas and Rural Settlement Area areas will lead to ease of living and planned development of area. Concept of suggestive proposed Development in ESZ is shown in Annexure 1.2, Chapter 1.2.2, Section 1.2.2.2, Fig. 2.2.

2.3 SUGGESTIVE GUIDELINES FOR DEVELOPMENT

The suggested guidelines for development in ESZ should be flexible yet conservation-oriented, ensuring that local communities are not adversely impacted by development activities. The development activities within the ESZ will only proceed following formal approval and in strict adherence to the approved plan. The guidelines aim to strike a balance between sustainable development and the preservation of the sensitive ecological environment. Their primary objective is to safeguard local ecosystems while promoting responsible development that benefits both the environment and residents. The following are the key suggestive guidelines to be considered for implementation:

- **No new commercial activities within 1 km from protected area:** Within one km from the boundary of Protected Area, no new commercial construction is allowed, but renovation and reconstruction of already existing commercial construction are allowed within the existing built-up area. Refer Annexure 1.2, Chapter 1.2.2, Section 1.2.2.3, Fig. 2.3.

- **Permissible Activities around water buffer area:**

The uniform guidelines have been followed to provide buffer area around the water bodies which will be act as a riparian zone. In that buffer area around water bodies only **conservation measure, agriculture and allied activities are allowed** (Regulated and Promoted Activities). Apart from mentioned activities rest of the activities are prohibited. Refer Annexure 1.2, Chapter 1.2.2, Section 1.2.2.3, Fig. 2.4.

Conservation areas for Water Bodies (Buffer)

Uniform guidelines have been established to define the necessary buffer zones around water bodies in the region. All the reservoirs and large rivers lie outside the ESZ. The conservation area for water bodies covers an area of 1328.36 hectares. These guidelines are as follows:

1. A minimum of 50 meters from the HFL/FTL of large rivers and lakes.
2. A minimum of 15 meters buffer from the edge of small water bodies such as ponds and streams.

- **Activities allowed in steep slopes areas:** For the conservation of steep slopes which is more than 20 degrees are only few activities allowed in that area and these are:

1. Local people shall be permitted to undertake construction on their land for their residential use.
2. Widening and strengthening of existing roads and construction of new roads
3. Construction and renovation of infrastructure and civic amenities
4. The ongoing regulated and promoted activities will be allowed in the ESZ.

Apart from mentioned points all other activities will be prohibited in the slope areas such as industries, home stays, new commercial activities, new hotels and Resorts. Refer Annexure 1.2, Chapter 1.2.2, Section 1.2.2.3, Fig. 2.5.

- **Guidelines for development in the Tiger Corridor**:
  As per the National Tiger Conservation Authority published guidelines for development in the Tiger Corridor. Refer Annexure 1.2, Chapter 1.2.2, Section 1.2.2.3, Fig. 2.6 and 2.7. Following regulations are:
  I. Residential Construction shall be allowed in all abadi land and till 100 meters distance from the Abadi Land.
  II. In non-Abadi land, residential construction is allowed with FAR restriction of 0.1
  III. Widening and strengthening of roads shall be allowed only after obtaining approval from the Forest Department. (Wildlife board)
  IV. Construction and renovation of infrastructure and civic amenities are allowed.
  V. No new commercial construction allowed in Tiger corridor area.

- **Guidelines for the development of Temple in steep slopes and 1 km from protected area:**
  The religious sites located within 1 km from the protected area and on the hill slopes , the regulation criteria is clearly defines that development will be allowed only to existing conditions for temple development only. No new commercial structure and no expansion commercial structure allowed in the religious place located in steep slope and 1 km from the protected area.

2.3.1 Suggested Guidelines for the development of hotels and resorts

The development of hotels and resorts in India is governed by various guidelines, rules, and regulations. Here's an overview of the relevant guidelines and the dos and don'ts for activities in these establishments are attached in Annexure 1.2, Chapter 1.2.2, Section 1.2.2.3.1.

2.4 AREAS FOR ECO-RESTORATION

Forest and Biodiversity are the key feature of PTR. The region has some of the oldest forest area in protected area of PTR, which has been habitat to wild animals from years. The forest has variety of species in flora, which are unique to the area, and some are mixture of southern and northern forest of India. Tiger is the main predator animal in PTR. The forest cover should be maintained and should be in its native terms so, the native animals have maintained their habitat and environment.

The suggestive locations for Eco-restoration such as

- Socio and Agro Forestry (Mundiareeth, Ghatkohka, Dawajhir, Dongergaon, and Marjatpur) as shown Annexure 1.2, Chapter 1.2.2, Section 1.2.2.4.1
- Bio-diversity Park (Halal Kala, Mohgaon (FV), Telia, and Karmajhiri) as shown Annexure 1.2, Chapter 1.2.2, Section 1.2.2.4.3
- Proposals for Botanical Park and Herb Park (Kuppitola, Salhai, Thota Mal, and Pulpuldoah) as shown Annexure 1.2, Chapter 1.2.2, Section 1.2.2.4.4
- Proposals for butterfly park and Flower trails (Mundiareeth, Savangi, Tikadi Mal and Kumbhpani) as shown Annexure 1.2, Chapter 1.2.2, Section 1.2.2.4.4, Fig. 2.12
- Proposals for Arboretum (Kohka lake, Dawajhir, Karmajhiri, Rukhad, Dharam Kua) as shown Annexure 1.2, Chapter 1.2.2, Section 1.2.2.4.5.

To protect and preserve these forest areas in Pench Tiger Reserve, protective infrastructure is proposed in ESZ. To reduce the poaching in PTR, a strict patrolling should be carried out in sensitive zones for the poaching. The use of technologies like Cameras, Drones, Thermal Cameras, SMART and other suitable surveillance & management methodologies should be adopted. The fencing for sensitive area with alarm should be done to stop the poaching incidents.

3 THEME PLANS

3.1 RESTORATION OF SOIL MOISTURE REGIME AND LAND CONSERVATION

Hills and Mountains

PTR has the flat landscape but having undulating landscape which provides a mesmerizing beauty to the area in its western and southern part. The suggested measures for slope stability can be implemented in the ground for conservation measures are mentioned in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.1.2.

Conservation through Agriculture

Conservation Agriculture focuses on soil management practices that preserve soil structure, composition, and biodiversity. Its core principles include maintaining soil cover (using crop residues or cover crops), minimizing soil disturbance through minimal tillage, and implementing crop rotations to manage biotic challenges as shown in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.1.3. It also promotes green manures, no burning of crop residues, integrated pest and disease management, limited soil traffic, and the use of bio-fertilizers and bio-pesticides.

3.2 RAINWATER HARVESTING

Rainwater harvesting is the technique of collection and storage of rainwater at surface or in sub-surface aquifers, before it is lost as surface run-off. Some suggested measures are mentioned in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.2.

3.3 WASTEWATER TREATMENT

Due to lack of wastewater management, currently all the domestic wastewater is directly disposed to the nearby waterbody without any treatment. Wastewater is to be collected through drainage system and is to be treated and then can be disposed to nearest waterbody or can be reuse in agricultural activities. Based on topography of village, suggestive location of disposal points with treatment facility are shown in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.3, Fig. 3-7.

3.4 SOLID WASTE MANAGEMENT

Considering rich biodiversity of PTR, Solid and Liquid waste management should be provided in all the villages and towns of ESZ of PTR at household level, community level and village level for effective management the waste. For effective implementation of Solid waste mangement, a conceptual model has been prepared as shown in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.4.

Solid waste management should be initiated from household level and hotel/Resorts. Door-to-door collection method and Composting methods (NADEP Method, Vermicomposting and Biogas from organic solid waste) should be promoted in the ESZ.

3.5 MANAGEMENT OF WATER SUPPLY, DRAINAGE AND STORM WATER

To provide basic physical infrastructure facilities, clusters are formed based on topography and distance of villages. Infrastructure facilities in villages with more than 3 km distance from other settlement should be developed as an individual village. Proposed cluster for water supply network are shown in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.5, Figure 3-12.

Water Supply - Tap water connection should be provided at household level for water supply in the villages of ESZ. Where tap water connection is not possible, community stand post or hand pumps should be provided within 100 m from settlement area.

3.6 SANITATION IN VILLAGES OF ESZ

Under the Swachh Bharat Mission, most households in all villages within the ESZ have had individual toilets constructed in recent years. The construction of household and community toilets in these villages will contribute to achieving Sustainable Development Goal 6 (SDG 6): Clean Water and Sanitation.

3.7 SOCIAL INFRASTRUCTURE FOR VILLAGES

Social Infrastructure is one of the critical aspects when it comes to development of rural area. Social infrastructure includes education facilities, public health facilities, Banking facility, recreational facilities etc. Suggestive locations for education, healthcare facilities, mobile network coverage and banking facility (Fig. 3-14), haat bazaar (Fig. 3-15) are shown in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.7, Fig. 3-13.

3.8 VEHICULAR TRAFFIC CONTROL

Roads are vital for rural communities, enabling access to goods and services and supporting economic development. According to census 2011, only 69.66% and 54.21% connect State Highways and Other District Roads, respectively, while 77.57% have all-weather road access. Village-level studies show that proximity to urban centers, main roads, and good rural road access boosts household income. Refer Annexure 1.2, Chapter 1.2.3, Section 1.2.3.8.

3.8.1 Proposal for Road widening and improvement of roads

The ESZ is divided into five clusters based on natural features, roads, and boundaries: **Turia, Karmajhiri, Jamtra-Kumbhpani, Khamarpani, Dharam Kua Clusters**: All have good road connectivity, with existing and proposed road lengths detailed in cluster-specific tables and maps, Annexure 1.2, Chapter 1.2.3, Section 1.2.3.8.1, Fig. 3-16.
With 98% of PTR ESZ villages linked by gravel roads and most having private transport access, proposed improvements include upgrading 9.31 km of roads and constructing 2.47 km of new roads. Road widths are proposed at 12m for highway connections, 9m for circuit roads, and 7.5m for linkage roads.

3.8.2 Proposal for Bus stop

To improve connectivity and public transport for local communities and tourism, bus stops are proposed at Turia, Pachhdhar, Jamtra, Dawajhir, Barelipar villages, Banskheda, Darasi Kala and Khamarpani, to serve the entire ESZ. Bus stops are suggested in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.8.2, Fig. 3-18.

3.8.3 Proposals for Conservation and Safety

ESZ boasts diverse flora and fauna, but expanding road networks and traffic may increase wildlife-human conflicts. To mitigate this, physical and policy measures, aligned with MoEFCC and Wildlife Institute of India guidelines, are proposed to protect humans and nature. PTR is divided into five zones based on forest presence, wildlife occupancy, tourism sites, and green corridors. Refer Annexure 1.2, Chapter 1.2.3, Section 1.2.3.8.3.

1. **Turia Cluster**: A major tourist hub with high footfall, especially in Turia and Pachhdhar, requiring robust conservation measures for linear infrastructure.
2. **Karmajhiri Cluster**: Predominantly agricultural with limited tourism (safaris from Karmajhiri and Kumbhpani gates) and few resorts.
3. **Jamtra-Kumbhpani Cluster**: Mixed forest and agricultural areas with limited safaris from Jamtra gate, reliant on agriculture.
4. **Khamarpani Cluster**: Southern PTR with minimal forest, dominated by agriculture and commercial activities; Khamarpani is a commercial hub.
5. **Dharam Kua Cluster**: Dense forest and tiger habitat with Dharam Kua as a key tourist spot, needing strong linear conservation measures.

3.8.4 Signages

To avoid the accidents of animals, the signages on road is mandatory to warn the drivers. This will be helpful to alert the drivers on that route.

1. **Turia Cluster**: High animal presence in jungle tourism areas requires signages every 2 km, at animal crossing structures, and near tourism sites to warn of wildlife.
2. **Karmajhiri Cluster**: Predominantly agriculture with minimal wildlife (except wild pigs); signages on major roads every 5 km.

3. **Jamtra-Kumbhpani Cluster**: Jungle tourism areas with animal presence need signages every 2 km, at crossing structures, and near tourism sites for warnings.
4. **Khamarpani Cluster**: Agricultural with low wildlife (except wild pigs); on major roads every 5 km.
5. **Dharam Kua Cluster**: Dense Forest with high animal occupancy requires frequent signages every 2 km along roads, at speed breakers, and animal crossing structures.

3.8.5 Speed Breakers

To enhance wildlife safety and reduce vehicle-related accidents in the ESZ, speed breakers, humps, and rumble strips are proposed to control vehicle speeds, particularly in forest and settlement areas, as determined by PTR authorities. Cluster wise proposals are shown in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.8.5.

3.8.6 Fencing

Fencing can be developed along entire linear infrastructure or can be developed among the known animal passing sections only.

The boundary wall of resorts/hotels/Farm stays or any such commercial structure should not be a hindrance to movement of wildlife. The cement walls have to be replaced with live hedges and should be only up to 4 feet height so as not to hinder wildlife movement. Furthermore, regarding trenches along boundaries, the order stipulates that these trenches "shall not be deep" and must be accompanied by "soil bunds along the boundaries of the trenches, so that the animals do not get trapped and fall into the trenches. The presence of internal corridors along streams and forest patches (including revenue forest) should be taken in mind and no hindrance of any kind to movement of wildlife should be done. At least 25m distance has to be maintained from such riverine and forest areas. (The Forest Conservation Act of 1980), (Working Plan, PTR 2025)

3.8.7 Wildlife Passages

Suggested structures for wildlife passages include tunnels or underpasses that accommodate local species.

- **Natural Crossings**: Canopy cover over kaccha/small roads supports arboreal species. Promote existing natural crossings and encourage vegetation growth every 100-200 m along roads for small animal movement.
- **Underpasses**: Tunnels, box culverts (3.5 m clearance with ledges for terrestrial species), and pipe structures (<1.5 m diameter) facilitate terrestrial and aquatic species (frogs, turtles, small mammals). Native vegetation at ends enhances usage.
- **Overpasses/Flyways**: Canopy bridges (poles, ropes, wooden ladders) with bush/tree cover at ends aid tree-dwelling species (monkeys, squirrels).

Proposed Wildlife Passage Structure in Eco-Sensitive Zone are shown in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.8.6.

3.8.8 Silence Zone

The silent zone within 1 km of the Protected Area boundary should be clearly defined and strictly enforced, with permissible noise levels of 50 dB(A) during daytime and 40 dB(A) at night. For the entire ESZ beyond 1 km from the Protected Area boundary, the permissible noise levels should be limited to 65 dB(A) during daytime and 55 dB(A) at night, as per the Noise Pollution (Regulation and Control) Rules, 2000. The silence zone is proposed in 1 km from of protected area boundary of PTR to preserve the animal habitat and movement in protected area and buffer zone. The proposed silence zone is shown in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.8.7, Fig. 3-20.

3.8.9 Regulatory Framework

To protect the environment several acts, notifications and rules and regulations consists by the legal framework in India. The relative act for roads and other infrastructure can be as Forest (Conservation) Act,

1980 and the EIA notification, 1994. Both acts play crucial roles in decision making for granting forest clearance and implementations.

3.9 Management of Resource Extraction

PTR is rich in natural resources like water, plants and trees, animals and birds and many other natural materials. Extraction of natural resources from Protected area of Pench Tiger Reserve is prohibited and designated as illegal activity. Collection of Minor Forest Produce are allowed under applicable forest law in certain limitation for livelihood of local community. Prohibited and regulated activities based on resource extraction are mentioned in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.9.

3.10 Management of Hazardous And Bio-Medical Waste

Segregation of recyclable plastic waste should be done at village or cluster level collection point and should be reuse plastic for various purpose or can be sold to the recycler and can generate revenue from it. Single use plastic should be banned in ESZ to reduce plastic pollution in the area.

Non-biodegradable, bio-medical and hazardous waste are to be collected in a separate bin for entire village and should be transported to the nearest landfill site. As ESZ is rich in biodiversity, no landfill sites have been proposed in ESZ area.

3.11 Surface and Ground Water Withdrawal

The extraction/storage of surface water is prohibited in Protected Area of Pench Tiger Reserve. To conserve these much of needs, it is advisable to levy mandatory measures for ground water recharge and rainwater harvesting in study area.

3.12 Protection to the Source of Water

Rivers like Pench and Bawanthadi with many streams flows through the PTR as potential water source to animals as well as villagers. The region has the Totladoah reservoir and many more as large potential surface water storages. The area is blessed with approximate rainfall of 1329 mm in the region but lacking to store or utilize the water as run-off because of slope is in high value. The conservation measures to preserve the water resources following suitable methodologies are discussed below.

Surface water

To preserve the surface waterbodies and its surrounding characteristics, a buffer area for waterbodies is proposed. The buffer is also helpful to tackle the floods and improves the ground water level in surrounding area of waterbodies as shown in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.11.1, Fig. 3-24.

Ground water

Most of the villages have depleting ground water level. Some suggestive Ground water recharge methods are mentioned in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.11.2 and watershed Management Map is shown in Fig. 3-31.

3.13 Development of Resilience to Climate Change

Conventional energy sources like coal, petrol, diesel and wood can damage the local environment. This could result in loss of forest cover and loss of habitat of animals. As PTR is covered largely with forest area, it is not possible to establish wind units in large numbers. So, Solar and biogas can be helpful at an extent to reduce the dependencies on conventional fuels.

3.13.1 Promotion of non-polluting Mobility

Turia has high numbers of visitors in weekends from surrounding urban centres. To minimize the pollution in area and enhance eco-tourism activities, few bicycle points and e-bike points are suggested. Refer Annexure 1.2, Chapter 1.2.3, Section 1.2.3.12.2, Fig. 3-32.

3.13.2 Solar Energy

Solar energy can be use in various ways in the villages of ESZ like use of solar water pump for water supply and irrigation purpose in farms, rooftop solar in schools and other government buildings, solar streetlights in the villages, use of solar energy for small commercial or industrial use etc.

3.13.3 Biogas

Biogas offers a cleaner, more sustainable alternative. It uses cow dung and other organic waste, which are readily available in most households with livestock. Biogas plants, whether at the household or community level, are successful in improving health, reducing pollution, and enhancing the quality of life. Refer Annexure 1.2, Chapter 1.2.3, Section 1.2.3.12.4.

3.13.4 Conservation of Night Sky

The analysis for the night sky can be represented with the Bortle Night Sky Scale assesses the quality and suitability of dark night skies. Most of Pench Tiger Reserve (PTR) falls under scale-3, indicating a rural sky site. Some southern and eastern areas of PTR may qualify for dark sky designation, transitioning from scale-2 to scale-3 skies. However, urban areas and settlements like Kurai, along NH48, contribute to bright skies due to high population density. Given this, PTR could apply for Dark Sky Reserve designation as shown in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.12.5, Fig. 3-34.

3.13.5 Measures for pollution control

This dense forest of Pench helps to eliminate the pollution in region and freshens the air. But Turia is the popular tourism destination and approximate, 1 lakh people visit in a year.

- **Establishing PUC Center:** There are no measuring stations and data available for PTR regarding any kind of pollution. By considering the tourist footfall, total 6 numbers of PUC Centers are proposed as shown in Annexure 1.2, Chapter 1.2.3, Section 1.2.3.12.6, Fig. 3-35.
- **Measures for water pollution:** The sample for water pollution measurements shall be collected with random sites for regular time intervals. The suggestion for regular at least in 1 year before and after rainfall sample should be collected and analysed for waterfall sites with Lakes, rivers nearby area of settlements, proposed camping sites and accommodation, reservoirs and ponds (Fig. 3-36).
- **Measures for Noise Pollution:** To eliminate the noise pollution, the silence zone is proposed in 1 km periphery of Protected Forest area of PTR to preserve the animal habitat and movement in Protected area (Fig. 3-37).

4 LIVELIHOOD ISSUES

4.1 STAKEHOLDER CONSULTATION

As a part of the stage baseline assessment - data collection for cluster 4 - ESZ, included the primary data collection which were supplemented with expert and stakeholder consultation of officials, villagers. People who will get affected by this project are the stakeholders such as investors, villagers, concerned government departents etc. Stakeholder consultation is one of the major part of planning process as shown in Annexure 1.2, Chapter 1.2.4, Section 1.2.4.1.

4.2 RURAL ECONOMY

There are five main pillars of economy of rural area of ESZ of Pench Tiger Reserve i.e., Agriculture, Tasar Farming, Forest, Animal husbandry & Tourism. Agriculture is predominantly major part of rural economy in India. For Pench Tiger Reserve, villages under Eco Sensitive Zone are mainly tribal villages and all the villages are near to the forest, these people are directly or indirectly dependent on forest produces & traditionally MFP are core part of economy. Also, due to dense forest area and Tiger Reserve, this region is tourist hotspot, and Turia is a major tourist attraction point throughout the year. Animal Husbandry is also one of the important components of rural economy. Strengthening economy of villages is attached in Annexure 1.2, Chapter 1.2.4, Section 1.2.4.2.

4.3 PROMOTION OF ECO-DEVELOPMENT ACTIVITIES

Agriculture, along with its allied sectors, is the primary livelihood provider in India, especially in rural areas, contributing significantly to the GDP. Sustainable agricultural practices, such as soil conservation, resource management, and biodiversity protection, are crucial for rural development.
PTR, traversed by the Pench River, is rich in agricultural land with shallow and deep black soils. The region's major crops include paddy, maize, and soybean. Historically, Kodo and Kutki millets were staple crops in the villages of the Eco Sensitive Zone (ESZ) of PTR, grown by the Gond and Baiga tribes. Minor millets are most important traditional crop in the tribal area of Madhya Pradesh. KODO MILLET, KUTKI MILLET are known to have drought resistance property which can make a region arid and help the poor to strengthen their economy. Government has launched various schemes for agriculture sector, implementation of the schemes as shown in Annexure 1.2, Chapter 1.2.4, Section 1.2.4.3. Honeybee Farming / Apiculture., Agro Forestry, Animal Husbandry should be promoted in the ESZ. Details about these as shown in Annexure 1.2, Chapter 1.2.4, Section 1.2.4.3.1 – 3.3.
Proposed Rural Tourism in Pench Tiger Reserve is provided on cluster wise basis. Each cluster is proposed with the rural tourism village, which needs to be developed as Model village also. The model villages can be consists for attracting tourism in rural areas, promote agro-rural-tourism in the region and generate the revenue for the villagers apart from the agriculture. The villages proposed for the same are Dongergaon, Kumbhpani, Ghatkohka, Rukhad, Dharam Kua and Pachhdhar as shown in Fig. 4.3.

4.4 TOURISM BASED ECONOMY

Pench Tiger Reserve is highly dependent on agriculture and tourism activities The tourism attraction towards protected zone is much higher than the Buffer zone of Tiger Reserve. Proposed tourism in buffer zone will provide employment to the local people as well as also provides business opportunity to locals. The below graph represents the economy of Tiger Reserve and its impact on local livelihood.

As the tourism increases in the buffer zone, there will be high consumptions of local produces, required accommodations and many other things. These will increase the opportunities for local employment and the tax benefits to the local authority. This will lead to upliftment of living standards of the community and region will be self-sustain. The linkages of economy with various parameters are shown in Annexure 1.2, Chapter 1.2.4, Section 1.2.4.4.

The private sector needs to share their profits/ incentives apart from providing employment to the locals. By doing so, the community-based development work like education, health and many more will get

suffice funds. On other hand, tiger reserve and the NGOs will do the groundwork to develop these infrastructure and facilities. The NGOs, Tiger Reserve and Private sector jointly can do the joint ventures for the eco-tourism and generate the fund for welfare of the society.

4.5 ARGO INDUSTRIES

Agro-based industries are those industries which have either direct / indirect link with agriculture. Industries which are based on agricultural produce and industries which support agriculture come under agro-based industries. Refer Annexure 1.2, Chapter 1.2.4, Section 1.2.4.5.

4.6 HOUSEHOLD INDUSTRIES THROUGH SHGS:

The public sector and NGOs as well as private entrepreneurs play an important facilitating role in developing linkages between agro-industry and farmers. This role may include organizing farmers or assisting NGOs or private enterprises to take on responsibilities previously discharged by states, providing credit, assisting with inputs, providing information on technology and ensuring that contract requirements are met. In this way, the public sector, NGOs, and private entrepreneurs are helping directly to create beneficial linkages between agro-industry and farmers and indirectly creating other linkages between the farm and non-farm sectors.

Household industries are mostly dependent on availability of raw material or resources. Household industries are one of the most important parts of resource-based industries. Area of Eco Sensitive Zone of Pench Tiger Reserve has a tremendous potential to develop household industries. As mentioned in above topics, there are number of forest products, agricultural products available in the region. Using that as a raw material, household industries can be develop that can generate employment in rural area and will generate side income for community. There are some government schemes and programs are going on for promotion of household industries in rural area and specially for tribal communities as shown in Annexure 1.2, Chapter 1.2.4, Section 1.2.4.6.

Under National Rural Livelihood Mission and State Rural Livelihood Mission, SHGs have been formulated in villages. NRLM and SRLM both can promote household industries in collaboration with NGOs and other private sectors for packaging, manufacturing and other type of industries. In addition, NGOs and other private sectors can provide training and resources through SRLM centres under super vision of Block managers of RLM centers.

4.7 Agro-based tourism

It is a part of the Ecotourism as it is related and subject to natural attractions. Both are described as forms with a rapid development of tourism. These forms are more marked in developed countries, conducting as models of potential development of natural resources and economic support of local society. Refer Annexure 1.2, Chapter 1.2.4, Section 1.2.4.7.

The sustainability of agro based tourism on the “health” of rural environment derives from the fact that this activity cannot be dissociated from the economic, social and cultural life of the community. Between tourism and environment there is a close relationship based on:

- The environmental elements considered to be tourist attractions.
- Facilities and tourism infrastructure.
- The impacts generated by tourism development and tourist use on the environment and settlements.

In rural areas, farmers often engage in multiple sectors to diversify income, as agricultural earnings alone may be insufficient. Increasing demand for tourism has become a significant source of income, with agro-tourism growing rapidly as tourists seek unique experiences. Agro-tourism combines agricultural activities with tourism, offering new opportunities for farmers to enhance their income and improve their quality of life. It educates the public about agriculture, boosts local economies, reduces urbanization by creating jobs, and promotes local products through direct marketing. It also stimulates economic activity and contributes to rural development by increasing revenue, creating jobs, fostering exchanges between rural and urban areas, and improving local infrastructure.

5 ECOTOURISM, INTERPRETATION AND CONSERVATION EDUCATION - SUB-ZONAL TOURISM MASTER PLAN

Madhya Pradesh offers a variety of tourism experiences, from historical and spiritual sites to natural attractions and wildlife destinations. Pench Tiger Reserve, with its rich biodiversity, scenic landscapes, and ancient sites, has strong potential to become a major tourist destination for all types of visitors.

5.1 EXISTING TOURISM FACILITIES AND ASSETS OF MPTB

Turia is a popular tourism destination of PTR. The tourism infrastructure such as accommodation are shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.1, Fig. 5-1 & 5-2. MPTB assets are shown in Fig. 5-3.

There are multiple locations and areas which are identified to develop as tourist spots and tourist activities. These areas and proposals are identified and proposed based on existing analysis of the region, stakeholders' consultations and potential of sites as shown in Fig. 5-5.

5.2 TOURIST ZONES

Tourism in Pench Tiger Reserve is flourished around Turia with focus of wildlife and weekend destinations. PTR is divided into 5 clusters as shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.2, Fig. 5-7. These clusters are classified based on 8 Tourism zones. The tourism zones are created on basis of primary tourism activities in region, other eco-tourism activities will be as supporting activities in region as shown in Fig. 5-8 to 5-12.

Tourism in PTR is concentrated around Turia, leading to high visitor numbers and biotic pressure, while areas like Karmajhiri, Jamtra, and Dharam Kua cluster see limited niche tourism. To balance this, inclusive tourism across different clusters is proposed, distributing visitor pressure more evenly.

5.3 SUGGESTIVE MEASURES FOR USE OF ECO-FRIENDLY MATERIAL AND VERNACULAR ARCHITECTURE

The suggested measures for the construction or upgradation of hotels and resorts in the ESZ involve using eco-friendly, locally available materials. These materials include cob, clay bricks, recycled glass, recycled plastics, and plant-based roofing, as detailed in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.2.6.

Incorporating vernacular architecture in ESZ hotels around Pench promotes eco-friendly and culturally rich tourism by blending modern comfort with local heritage and ecological balance. To enhance tourism activities in identified tourist sites, various types of tourism can be promoted based on tourism zones and their clusters, as explained in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.2.7.

5.4 ENHANCEMENT OF TOURISM ACTIVITIES IN IDENTIFIED TOURIST SITES

5.4.1 Wildlife Safari

The major tourist attraction is Turia Gate. There are existing 3 safari gates for Protected area (Jamtra, Karmajhiri and Turia) and 3 safari routes in buffer area (Telia, Rukhad and Kumbhpani). Safari is proposed in Dharam Kua cluster and Masoor Nala Barrier. (Working Plan, PTR 2025) Details are shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.3.1, Fig. 5-13.

5.4.2 Nature Trails and Cycle Routes

Nature Trails are best way to explore the nature by walking in forest, acknowledging about flora fauna and taking experience to wander in forests. Proposed nature trails are for Mahadeo Kholi (3.51 km), Rukhad to Usekatta (9.97 km) and Amba mata temple nature trail (2.89 km) in Dharam Kua cluster, Kumbhpani Nature trail (4.16 km) in Jamtra cluster, Tikadi Mal Nature trail (4.65 km) in Karmajhiri cluster. All locations are shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.3.2., Fig. 5-16. A potential river walk can be explored after brief study in nearby river Bawanthadi by Forest Department. (Working Plan, PTR 2025)

5.4.3 Camping, adventure activities, Rural Tourism and Late Evening Safari

Camping offers an immersive nature experience amidst rivers, mountains, and wildlife. The suggestive proposed camping sites are Dharam Kua, Kumbhpani, Turia, Kohka, Dawajhir, Tikari mal, Singardeep, Dudhia Talab, Ghatkohka, Marjatpur, Pulpuldoah, Dongergaon, Kokiwara and Mohgaon Tikri as shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.3.3, Fig.5-21.

The thematic adventure park can be developed as per the storyline of the Jungle Book. The suggestive proposed locations for adventure activities are Karmajhiri, Turia, Kohka, Khamarpani and Banskheda are proposed as shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.3.4, Fig. 5-23. (Working Plan, PTR 2025) The activities like Rope Climbing, cycling, Bungee jumping, swoop swing, Painball, Sky cycling, High Rope Challenge, archery and many more.

Rural tourism is distinctive to its locality; the foods, products and landscapes have been shaped by generations, providing opportunities to create authentic appealing experiences for visitors that allow local communities to celebrate and take pride in their culture. The suggestive proposed locations for Rural tourism are Dongorgaon, Kumbhpami, Ghatkohka, Rukhad, Pachhdhar and Dharam Kua as shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.3.5, Fig. 5-25.

Late Evening safari is a romanticizes experience with dense forest in night. Late Evening Safari is ongoing in Pench Tiger Reserve in areas of Telia Buffer. The proposed locations for stargazing are Dharam Kua, Kuraigarh, Rukhad, Turia, Karmajhiri, Jamtra, Pulpuldoah, Ambamai Temple and Mahadeo Kholi as shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.3.6, Fig. 5-26. They provide a beautiful landscape view of Pench Range along with night sky. Mahadeo Kholi is in the lap of Mountain Range, provides the direct touch with nature and camping along with stargazing. These areas can provide the rich experience of wildlife as well as forest under the starry dark nights. To experience the forest and environment from up above the sky, hot air balloon can be proposed in the PTR.

5.5 CONSERVATION BASED TOURISM

Proposed methods for conservation-based tourism are to enhance environmental balance. To manage tourism's biotic pressure, conservation-based tourism has been introduced. This concept can be helpful to flourish the flora fauna of the region and helpful to create habitat for some of the species. With proper landscape development and conservation, it may attract the researchers as well as tourists in the region. The suggestive proposed locations for Glamping and Arboretum are Dawajhir, Karmajhiri, Kohka Lake, Rukhad and Dharam Kua. The suggestive proposed locations for Pollinator Park are Khamarpani, Dawajhir, Karmajhiri, Kohka Lake and Rukhad as shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.4, Fig. 5-28.

5.6 LOW IMPACT TOURISM ACTIVITIES AND CONSERVATION OF HERITAGE SITES

Low-impact tourism activities are designed to minimize environmental damage and promote sustainable travel. These zones are designated to protect and conserve biodiversity, wildlife habitats, and ecosystems around national parks, wildlife sanctuaries, and protected areas. Some low-impact tourism activities are Nature Walks and Birdwatching, Camping (Low-Impact, Eco-Friendly), Cultural Tourism and Heritage Walks, Wildlife Photography (Non-Intrusive), Sustainable Agriculture Tourism (Agro Tourism), River Rafting and Canoeing (Eco-Friendly) and Herb and Medicinal Plant Tours as shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.5.

KuraiGarh and Sahid Smarak should be conserved as heritage sites as shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.6, Fig. 5-31.

5.7 CONNECTIVITY LINKAGES

Connectivity is key to boost tourism in PTR. Statues, artwork, Cultural Monuments and Stories and Paved walkway can be proposed. The lake front Development walkway and food street market is proposed at

Kohka and Dawajhir Lake as shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.7. Linkages are proposed on regional as well as local level to provide better connectivity in PTR as discussed in 3.7.1.

5.8 INFRASTRUCTURE

Infrastructure is essential for developing tourism sites to enhance the visitor experience. On-site infrastructure should include e-toilets, water fountains, standposts, signages, dustbins, and changing rooms. The suggestive proposed locations of Accommodations are Dongergaon, khamarpani, Banskheda, Parsapani, Barelipar, Turia, Dulhapur and Panjara. The proposed infrastructure is outlined in as shown in Annexure 1.2, Chapter 1.2.5, Section 1.2.5.9.

5.9 PROMOTION OF TOURISM IN PTR

Tourism promotion leverages advertisements across media like TV, print, and digital platforms to attract visitors, with medium choice based on budget and goals. In Pench, experience-based promotions via bloggers, training hubs, exhibitions, destination weddings, and events like photography contests and marathons enhance regional appeal and brand visibility. Promotion can be done through Trainings, Exhibitions and Gatherings.

6 RESEARCH, MONITORING AND TRAINING

6.1 PRIORITIZATION OF RESEARCH AND MONITORING

Research is important to understand the behaviour of species of flora and fauna. These can be helpful to create a native atmosphere for these species, their behaviour and growth pattern and dependencies. Research work may involve state level institutions and national level institutions for the area.

Pench Tiger Reserve has the two-green corridor. Biodiversity have been unique in these areas of Dharam Kua and Telia as it has been undisturbed. The animal movements can also be observed. The area of Dharam Kua and Telia are proposed for research locations. Other than that, Kumbhpani and Pulpuldoh can be potential site as it has biodiversity and uniqueness in area for research and conservation work on forest and biodiversity. The research work requires the permission from PTR and Non-objection certificate from state biodiversity board. Proposed Tentative Research area locations are shown in Annexure 1.2, Chapter 1.2.6, Fig. 6-1.

6.2 DEVELOPMENT OF HUMAN RESOURCES FOR IMPLEMENTATION OF PLAN AND SKILL DEVELOPMENT

Training is an integral part for capacity building. Training program regarding to generate skilful labour for tourism, conservation and forest protection as well as maintaining infrastructures are suggested based on provided proposal in ESZ area. Training for conservation measures and upgradation of technology should be provided as per necessity to increase the work efficiency and enhancement of knowledge. Refer Annexure 1.2, Chapter 1.2.6, Table 6-1.

6.3 ESTABLISHING A LEARNING CENTRE

Awareness programs for flora and fauna should be conducted on regular duration of 6 months for villagers, schools, guides and ground staff of PTR. This training of local villagers can be helpful for community-based conservation and awareness. It is suggested that awareness and knowledge programs for all should be developed and nationwide a training in PTR should be provided. These can spread awareness in schools and other institutes as well as promotion of PTR and tourism can be done through it. The training and awareness programs can be developed by EPCO and Bio-diversity boards. Workshops and awareness programs can be conducted, with support from NGOs for spreading awareness and conducting training.

7 PERMISSIONS, ORGANIZATION AND ADMINISTRATION

The process for issuing permissions within the ESZ is governed by the provisions outlined in the ESZ Zonal Master Plan. Permissions are categorized into two types of activities: regulated & promoted activities and prohibited activities. In accordance with the guidelines set forth in the ESZ Master Plan, the regulatory authorities will issue permissions for regulated and promoted activities after receiving recommendations from the Monitoring Committee. Permissions will be granted only for activities that are not prohibited, in accordance with the guidelines outlined in the ESZ Zonal Master Plan. If an activity is not specifically mentioned in the ESZ Master Plan, the regulatory authorities will grant permission based on the recommendations provided by the Monitoring Committee.

The guidelines were formulated based on the discussions held during the Inter-departmental meetings. These guidelines for development within Eco-Sensitive Zones (ESZ) are designed to balance conservation and community needs, ensuring that local ecosystems are preserved while supporting responsible development. Development will be restricted in areas within 1 km from Protected Area boundary (no new commercial construction is allowed), regions with hill slopes over 20 degrees, conservation zones around water bodies, in the tiger corridors, and locations of religious significance. Specific locations related to land use are not provided; only suggestive locations are indicated for all the proposals in the ESZ Zonal Master Plan.

No new commercial construction activities within 1 km from protected area boundary: There is no new commercial construction of new hotels and resorts is allowed within the 1 km from the boundary of the protected area. However, the renovation and reconstruction of existing hotels and resorts is allowed in ESZ area. Refer Annexure 1.2, Chapter 1.2.2, Section 1.2.2.3, Fig. 2-3.

Activities allowed in steep slopes areas: In areas with steep slopes greater than 20 degrees, only few activities will be allowed to ensure conservation. Local residents will be permitted to undertake construction on their land for residential purposes. Additionally, the widening and strengthening of existing roads, as well as the construction of new roads, will be allowed to improve connectivity. The construction and renovation of infrastructure and civic amenities will also be permitted to meet the community's needs. Ongoing activities in these slope areas will be allowed to continue. However, all other activities, including industries, home stays, new commercial ventures, hotels, and resorts, will be strictly prohibited in these sensitive areas to protect the environment and prevent further degradation of the slopes. **Error! Reference source not found.** is shown in Annexure 1.2, Chapter 1.2.2, Section 1.2.2.3, Fig. 2 -5.

Permissible Activities around water buffer area: Uniform guidelines have been established to define buffer zones around water bodies, which will function as riparian zones for conservation purposes. Within these buffer areas, only conservation activities, agriculture, and allied practices will be permitted. All other activities will be prohibited to protect the ecological balance. A minimum of 50 meters will be maintained from the HFL or FRL of large rivers and lakes, while a minimum of 15 meters will be required as a buffer from the edges of smaller water bodies such as ponds and streams. These guidelines ensure the preservation and sustainable management of water resources in the region. **Error! Reference source not f ound.** is shown in Annexure 1.2, Chapter 1.2.2, Section 1.2.2.3, Fig. 2-4.

Guidelines for development in and around tiger corridor:
As per the National Tiger Conservation Authority's guidelines for tiger corridors, residential construction is allowed on abadi land and within a 100-meter buffer, In non-Abadi land, residential construction is allowed with FAR restriction of 0.1. Widening and strengthening of existing roads, as well as new road construction, are permitted. Infrastructure and civic amenities can be constructed or renovated. However, new commercial construction is prohibited. Apiculture, pisciculture, sericulture, and the farming of domestic animals like pigs and poultry are allowed in the buffer zone to support sustainable livelihoods. **Error! Reference source not found.** is shown in Annexure 1.2, Chapter 1.2.2, Section 1.2.2.3, Fig. 2-6.

Guidelines for the development of Temple in steep slopes and 1 km from protected area:

The religious sites located within 1 km from the protected area and on the hill slopes , the regulation criteria is clearly defines that development will be allowed only to existing conditions for temple development only. No new commercial structure and no expansion comercial structure allowed in the religious place located in steep slope and 1 km from the protected area.

7.1 STRUCTURE AND RESPONSIBILITIES

The monitoring on the development activities in the Eco-Sensitive area around Pench Tiger Reserve will be under regulatory authorities such as local bodies, Revenue department, Pollution Control Board and Forest departmennt. These regulatory authorities will be monitoring in terms of permission of regulatory activities as mention in the Gazette Notification. List of Regulatory activities under Regulatory Authority are mentioned in Annexure 1.2, Chapter 1.2.7, Table 7-1. Development, Conservation and Restricted Areas in ESZ is shown in Fig. 7-1.

As per the ESZ Zonal Master Plan, the regulatory authority, based on the monitoring committee's recommendations, will approve regulated and promoted activities. No permission will be granted for Prohibited activities.

7.2 MONITORING COMMITTEE

As per Section 5 of Notification S.O. 4009 (E) of declaring Pench Tiger Reserve as Eco-Sensitive Zone suggests a framework for monitoring committee, which is to be formed by State Government. In exercise of the powers conferred by sub-section (3) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986), the Central Government hereby constitutes a Monitoring Committee for a period of **three years**, for effective monitoring of the ESZ is mentioned in Annexure 1.2, Chapter 1.2.7, Section 1.2.7.1, Table 7-2.

The monitoring committee is suggested to extend till completion of implementation of the proposals. The expansion of timespan for monitoring committee will be as per decision of State or Central Government.

8 PHASING

8.1 PHASE WISE PRIORITY OF PROPOSALS

Approach for cluster-based proposals in Zonal Master Plan for Eco-Sensitive Zone of Pench Tiger Reserve is considered due to large extent of the area. Total Eco-sensitive Zone area is divided in 14 clusters as per their natural boundaries, characteristics, livelihood and many other factors for proposed development activities like tourism, livelihood and conservation proposals. In below section, the priorities for the proposals are provided in short term (0-7 years), Medium term (7-14 years) and Long term (more than 14 years). The priority for the same is suggested with consideration of following parameters:

1. Existing importance of area (i.e. tourism, livelihood activities, etc.)
2. Available infrastructure
3. Potential for development and need of conservation measures
4. Inter-dependencies of the proposals

8.1.1 Phasing interventions for tourism activities

Pench Tiger Reserve has vast opportunities for the tourism. The priorities for tourism activities are decided based on the existing tourism activities, infrastructure, and potential for development. The brief phasing for the activities is shown in Annexure 1.2, Chapter 1.2.8, Section 1.2.8.1.1, Table 8-1.

8.1.2 Phasing interventions for Development and Conservation Proposals

Development activities like livelihood through Traditional cropping, Apiculture development, Agro-forestry and various value addition for MFPs along with conservation process like ground and surface water protection, Conservation of Dark sky and many more are long term process. These activities are proposed as per the existing schemes and may take time for development. These activities are considered as continuous development throughout all phase of Zonal Master Plan. The phasing for the activities for development and conservation are as shown in Annexure 1.2, Chapter 1.2.8, Section 1.2.8.1.2, Table 8-2.

8.1.3 Phasing Interventions for Infrastructures

The priority of infrastructure development in notified villages are based on the activities proposed in the cluster. Village wise priority for infrastructure development is as Annexure 1.2, Chapter 1.2.8, Section 1.2.8.1.3, Table 8-3.

8.2 SOURCE OF FUNDING AND DRAWING AND DISBURSING MECHANISM

Source of Funding and Drawing and Disbursing Mechanism is shown in Annexure 1.2, Chapter 1.2.8, Section 1.2.8.2, Table 8-4.

9 CONCLUSION

The Zonal Master Plan of PTR is a forward-thinking, comprehensive framework designed to harmonize sustainable development with ecological conservation. Anchored by a clear vision to study and evaluate the influence of the ESZ on regional development, the plan outlines a robust strategy to foster socio-economic growth while safeguarding the region's rich biodiversity, habitats, and wildlife. Through well-defined short-term and long-term objectives, it addresses critical aspects such as regulating developmental activities, promoting eco-tourism, preventing resource depletion, and generating livelihood opportunities for local communities through community participation and skill development.

The plan introduces eco-friendly land use planning, flexible yet conservation-oriented guidelines, and theme-based strategies to ensure sustainable resource management, including soil conservation, rainwater harvesting, wastewater treatment, and solid waste management. It emphasizes infrastructure development tailored to the needs of the 81 notified villages, with a focus on equitable access to social and physical amenities. The Sub-Zonal Tourism Master Plan enhances the region's tourism potential by promoting low-impact activities, wildlife safaris, nature trails, and conservation-based tourism, ensuring minimal environmental impact while boosting the local economy.

Despite challenges such as limited data availability, the plan leverages stakeholder consultations and inter-departmental collaboration to propose actionable measures, including wildlife passages, noise and pollution control. By prioritizing research, monitoring, and training, the plan ensures adaptive management and capacity building. The regulatory framework, supported by local bodies, the Forest Department, and other authorities, ensures strict adherence to conservation-oriented guidelines, balancing development with the preservation of Pench Tiger Reserve's ecological integrity. This visionary document lays a strong foundation for sustainable progress, fostering a symbiotic relationship between human development and environmental stewardship.

PREPARATION OF ZONAL MASTER PLANS FOR ECO SENSITIVE ZONES: PENCH TIGER RESERVE (INDIRA PRIYADARSHINI PENCH NATIONAL PARK AND MOWGALI PENCH SANCTUARY)




VOLUME 2 - ANNEXURES

Madhya Pradesh Tourism Board, Bhopal

SYSTRA SAL GROUP

PREPARATION OF ZONAL MASTER PLANS FOR ECO SENSITIVE ZONES: PENCH TIGER RESERVE (INDIRA PRIYADARSHINI PENCH NATIONAL PARK AND MOWGALI PENCH SANCTUARY

IDENTIFICATION TABLE	
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Project	PREPARATION OF ZONAL MASTER PLANS FOR ECO SENSITIVE ZONES: PENCH TIGER RESERVE (INDIRA PRIYADARSHINI PENCH NATIONAL PARK AND MOWGALI PENCH SANCTUARY
Study	ANNEXURE
Confidentiality	Confidential
Language	English
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Annexure 1.1 : List of notified villages

Sr.No	Villages	Decimal Degrees	
		Lat	Long
1	Tikari mal	79.29538889	21.84411111
2	Tikari Rayat	79.29605556	21.84366667
3	Karmajhiri (FV)	79.31991667	21.82733333
4	Barelipar	79.34963889	21.83852778
5	Salahai	79.36475	21.85358333
6	Simariya	79.42166667	21.88561111
7	Sarahari	79.37844444	21.8685
8	Bhodki	79.38761111	21.86594444
9	Tevni	79.38858333	21.87769444
10	Ghat kohka	79.402	21.87866667
11	Katangi	79.40466667	21.86044444
12	Murer (FV)	79.41552778	21.85111111
13	Panjra	79.42255556	21.87391667
14	Sindaria	79.43319444	21.87427778
15	Dhutera	79.44394444	21.86247222
16	Mohgaon titri	79.44775	21.89594444
17	Patrai	79.45219444	21.87444444
18	Niwari	79.46377778	21.89533333
19	Alesur	79.47941667	21.88244444
20	Agri	79.49263889	21.89608333
21	Paraspani	79.33436111	21.85683333
22	Raiyarao	79.46522222	21.79791667
23	Pindkapar	79.50841667	21.80752778
24	Kodajhir	79.48905556	21.79125
25	Setewani	79.47936111	21.77622222
26	Potia	79.45197222	21.77927778
27	Ambari	79.45197222	21.78194444
28	Khamreeth	79.37272222	21.76994444
29	Kmamba	79.37433333	21.76497222
30	Vijaypani	79.39886111	21.75622222
31	Jeerewara	79.426	21.75363889
32	Mohgaon yadav	79.45533333	21.76238889
33	Durgapur	79.35736111	21.74683333
34	Satosha	79.37019444	21.74833333
35	Ambajhiri	79.41286111	21.73772222
36	Telia	79.371	21.69861111
37	Awarghani	79.35211111	21.73233333
38	Kuppitola	79.38922222	21.73411111
39	Nayagaon	79.44702778	21.73227778
40	Mundiareeth	79.41922222	21.73088889
41	Pachdhar	79.44769444	21.72672222
42	Kohka	79.36422222	21.71525

Sr.No	Villages	Decimal Degrees	
		Lat	Long
43	Turia	79.36605556	21.73494444
44	Arjuni	79.38830556	21.67894444
45	Kothar (FV)	79.42391667	21.69197222
46	Sakhadehi	79.59980556	21.91433333
47	Darasi khurd	79.62622222	21.90911111
48	Darasi kala	79.63608333	21.90597222
49	Savangi (FV)	79.58591667	21.81591667
50	Bavanthadi (FV)	79.57232778	21.81534722
51	Gandatola or Rukhad	79.52691667	21.87108333
52	Nayegaon (FV)	79.57961111	21.89886111
53	Khapa	79.64083333	21.89305556
54	Atarwani	79.6675	21.87063889
55	Magarkatha	79.67627778	21.87427778
56	Pandayer	79.71194444	21.89358333
57	Dulhapur (Baputola)	79.73975	21.88563889
58	Mohgaon (FV)	79.65611111	21.81555556
59	Mirchhwadi	79.74856667	21.855675
60	Dharam Kua (FV)	79.74872222	21.85547222
61	Kurai	79.50322778	21.8132
62	Banskheda	79.24166667	21.89022222
63	Kumbhpani (FV)	79.26680556	21.87130556
64	Dawajhir	79.22038889	21.86805556
65	Jamtara	79.25025	21.84413889
66	Kanhasagar	79.19561111	21.851
67	Thotamal	79.20036111	21.85138889
68	Thota raiyat	79.20722222	21.84811111
69	Naharjhir	79.21280556	21.83658333
70	Bandhan mal	79.17172222	21.81902778
71	Pathri	79.19683333	21.82083333
72	Bandhan raiyat	79.16197222	21.81369444
73	Gumtara	79.2195	21.80694444
74	Pathra khurd	79.1975	21.80633333
75	Khamariya	79.14888889	21.81297222
76	Singardeep	79.16316667	21.79552778
77	Ghargaon	79.14222222	21.78413889
78	Konapindrai	79.33230556	21.93419444
79	Sajpani	79.28688889	21.93458333
80	Halal kala	79.30141667	21.80511111
81	Halal khurd	79.30869444	21.91752778
82	Madariya	79.2645	21.91097222
83	Kokiwara	79.25125	21.89236111
84	Dhoulpur	79.25083333	21.89077778
85	Kharanj (FV)	79.14533333	21.84863889
86	Saliwada	79.11377778	21.73933333

Sr.No	Villages	Decimal Degrees	
		Lat	Long
87	Antra	79.09922222	21.75888889
88	Dongargaon	79.11608333	21.73933333
89	Kadhiya	79.19744444	21.80625
90	Dainy	79.11225	21.70219444
91	Marjatpur	79.10033333	21.75830556
92	Pulpuldoh	79.11713889	21.72205556
93	Khamarpani	79.09975	21.73933333
94	Dudhgaon	79.17663889	21.70188889
95	Kanhargaon	79.11211111	21.70188889
96	Devri	79.11816667	21.74847222
97	Mohgaon khurd	79.15152778	21.67758333
98	Sanwari	79.12894444	21.73402778
99	Thuyepani	79.14552778	21.66958333
100	Chirrewani	79.14675	21.15216667
101	Basanpur	79.11922222	21.65936111
102	Bordi	79.15511111	21.77272222
103	Sirrepani	79.18030556	21.75463889
104	Pathra kala	79.14675	21.66958333
105	Kokiwara	79.17869444	21.75469444
106	Kundai	79.12413889	21.65386111
107	Silota kala	79.12952778	21.78477778
108	Silota khurd	79.13736111	21.776

Annexure 1.2: Chapter wise

1. Planning a green landscape
2. The strategies
3. Theme plans
4. Livelihood issues
5. Ecotourism, interpretation and conservation education sub-zonal tourism master plan
6. Research, monitoring and training
7. Permissions, organization and administration
8. Conclusion

1.2.1 Planning a green landscape

1.2.2 The strategies

1.2.2.1 Eco-Friendly Land Use Planning

Table 2- 1: Exiting land use table

Land Use /Land Cover	Area (sq km)	Percentage to Total land cover area (%)
Agricultural Land	249.66	32.99%
Built up	9.09	1.20%
Forest	480.11	63.44%
Waste Land	5.53	0.73%
Waterbodies	12.46	1.65%
Total Area	**756.85**	**100.00%**

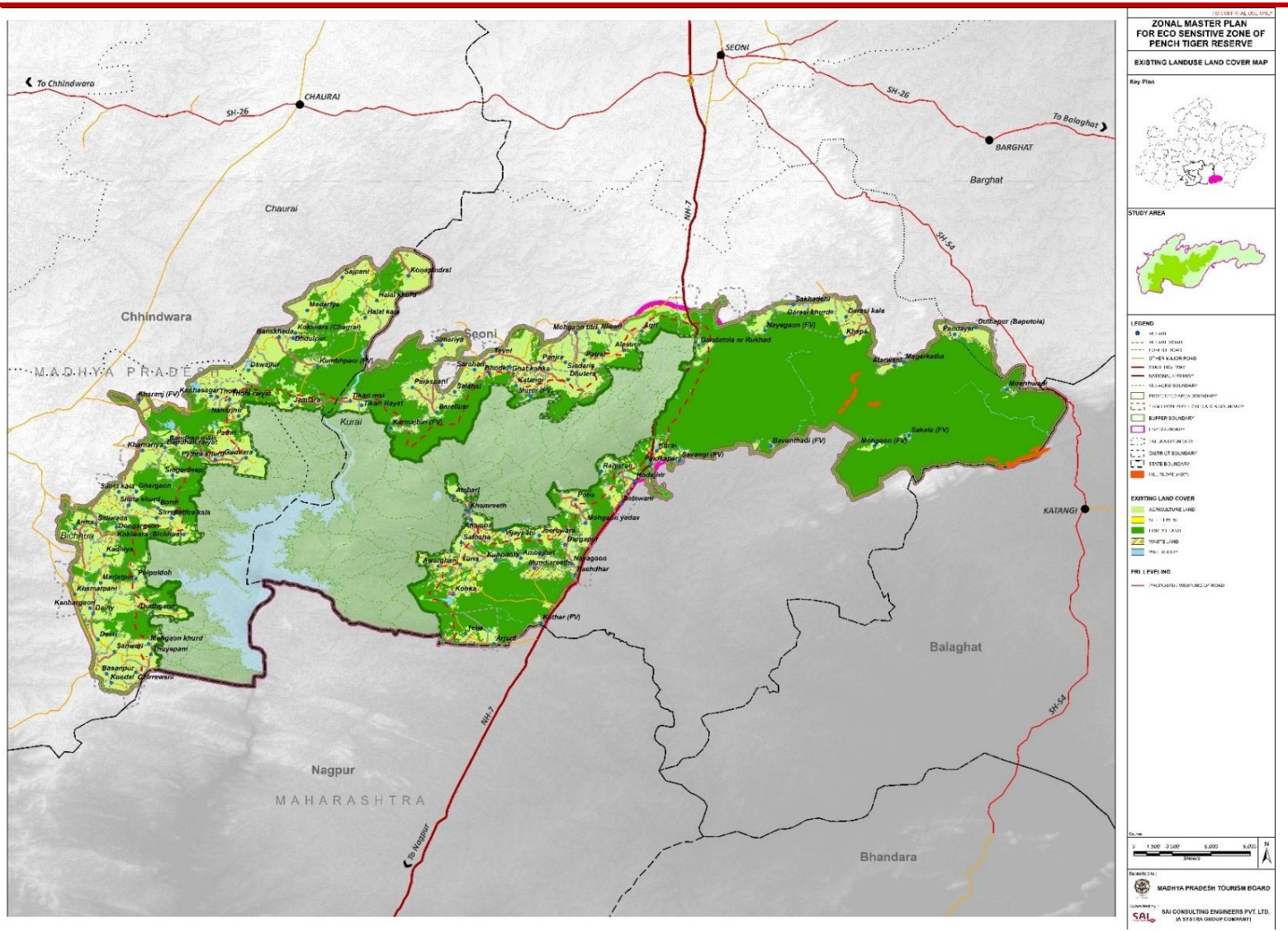


Figure 2. 1: Existing Land Use /Land Cover-PTR

Source: MPSEDC

1.2.2.2 Area for Sustainable Development

Figure 2. 2: Concept of suggestive proposed development in Eco Sensitive zone of Pench-Tiger Reserve

1.2.2.3 Suggestive Guidelines for Development

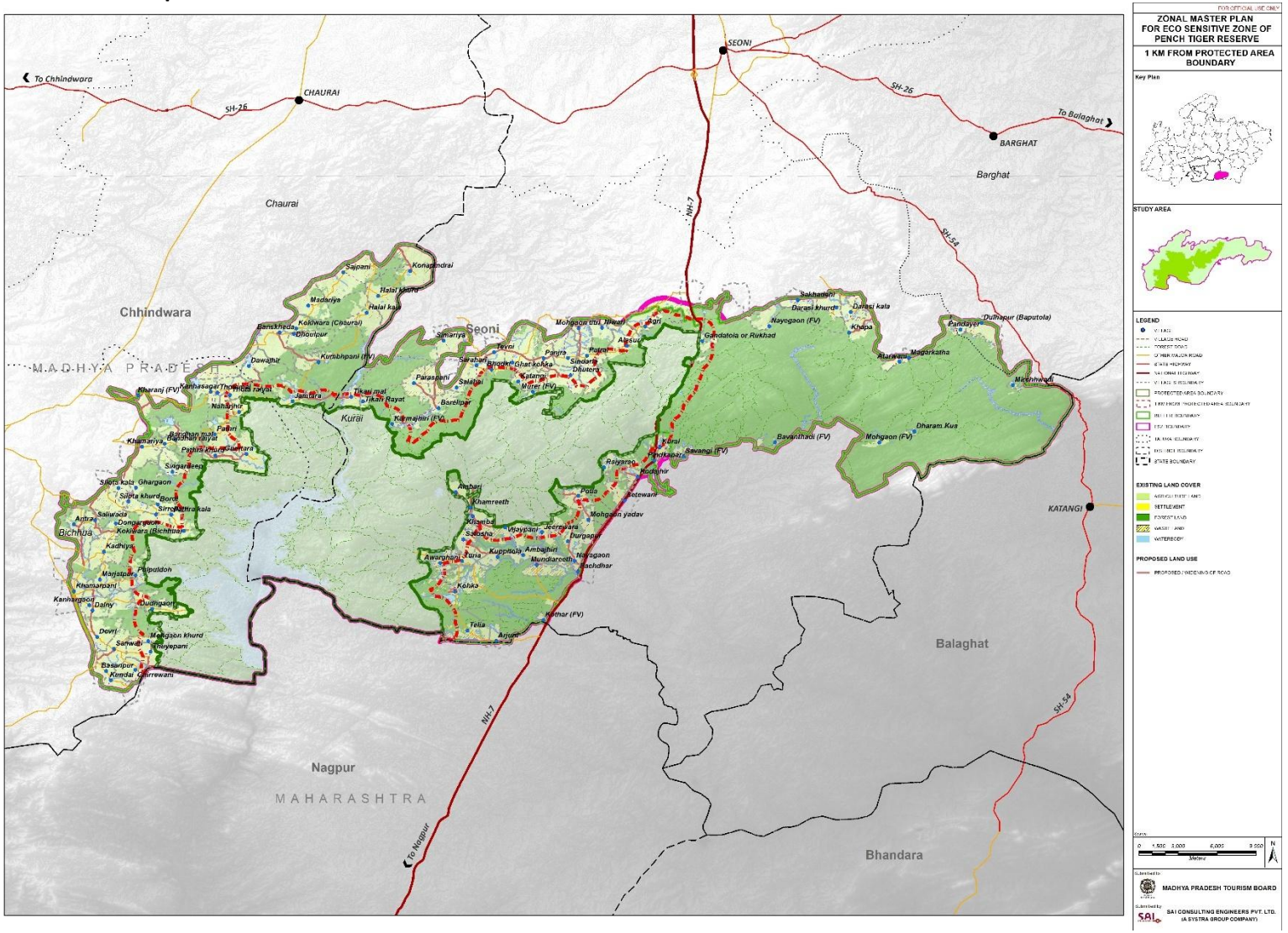


Figure 2. 3: 1 km from Protected area Boundary Map

Source SAI Consultants

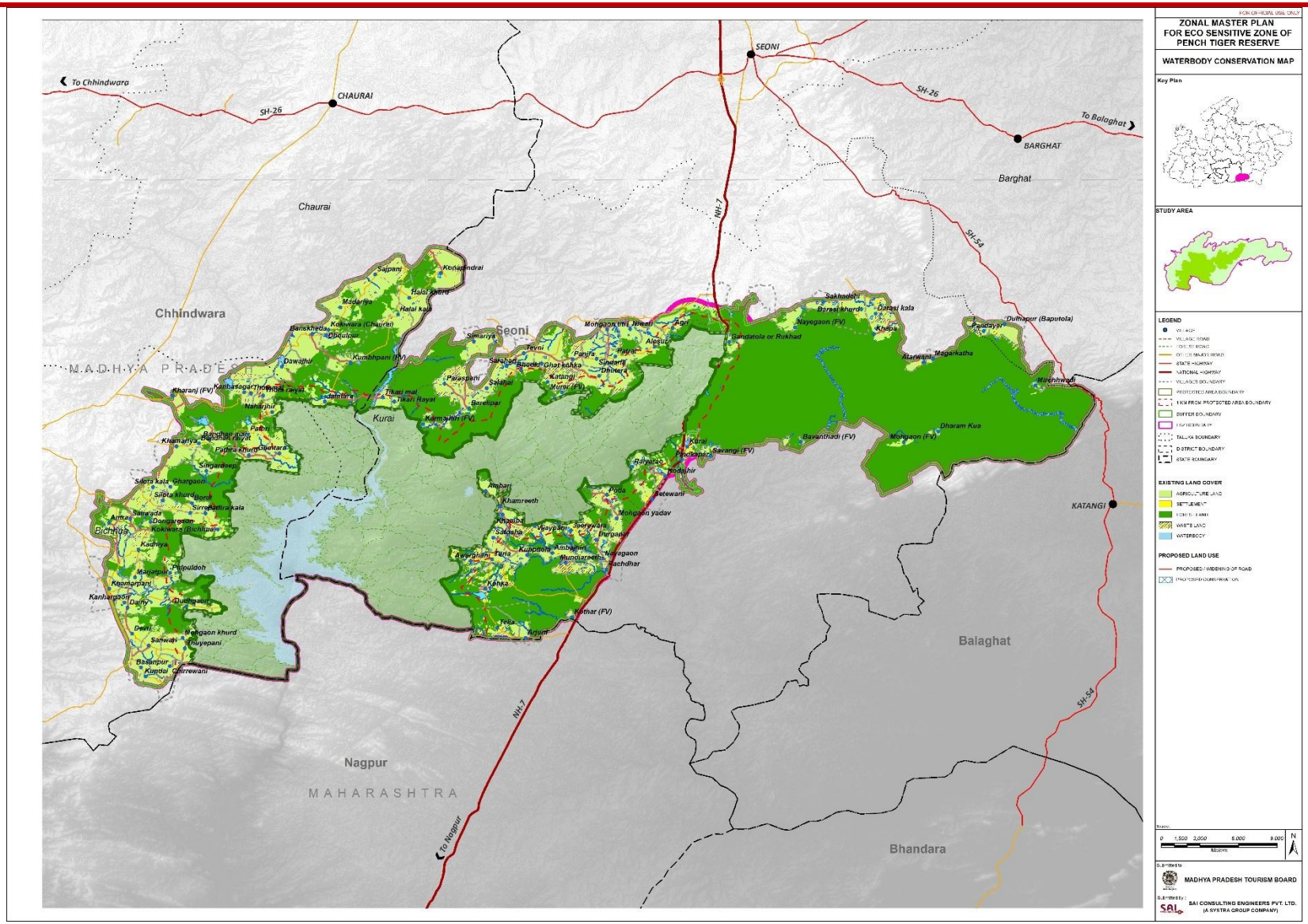


Figure 2. 4: Water body Conservation Map

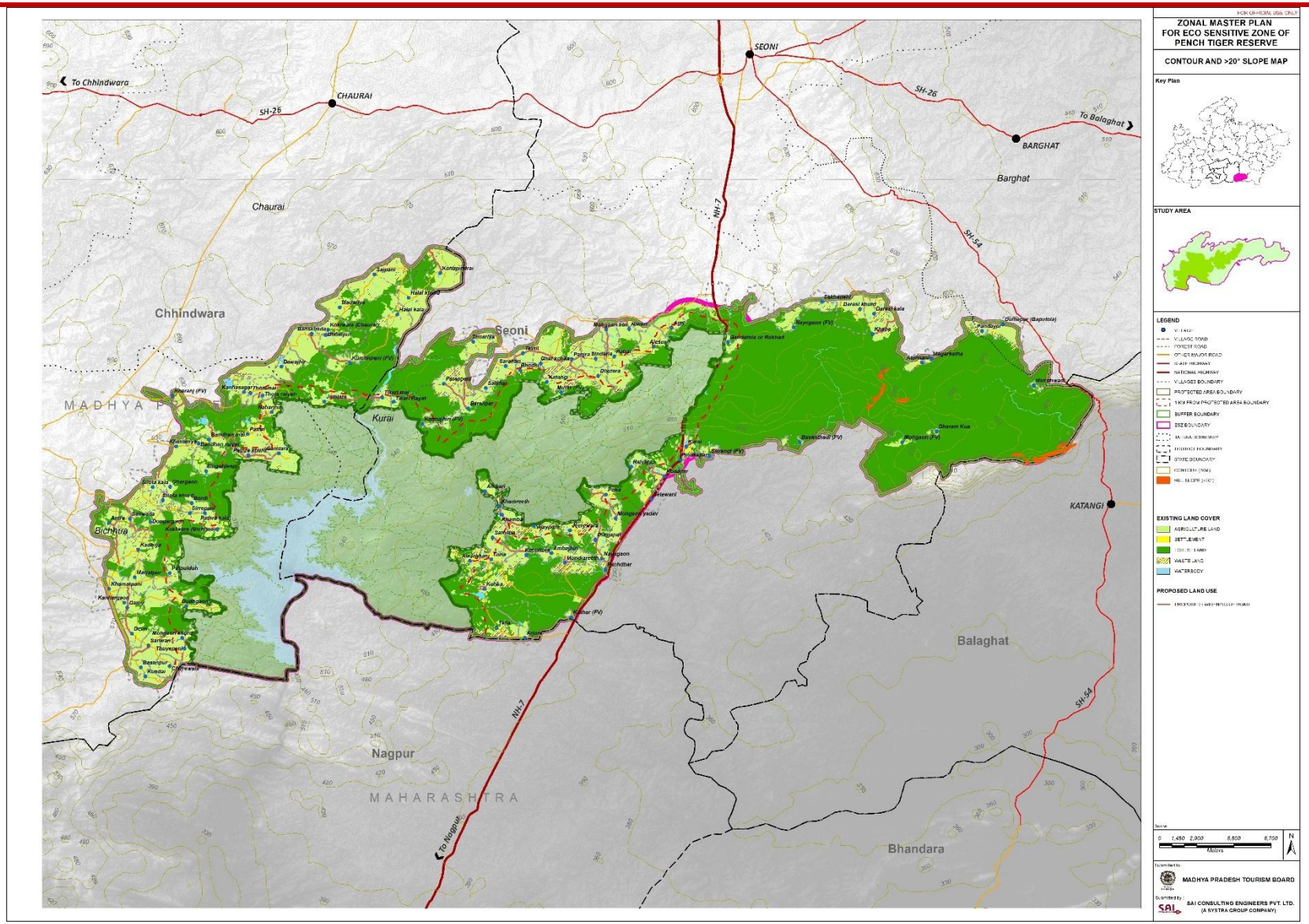


Figure 2. 5: Slope more than 20° in PTR

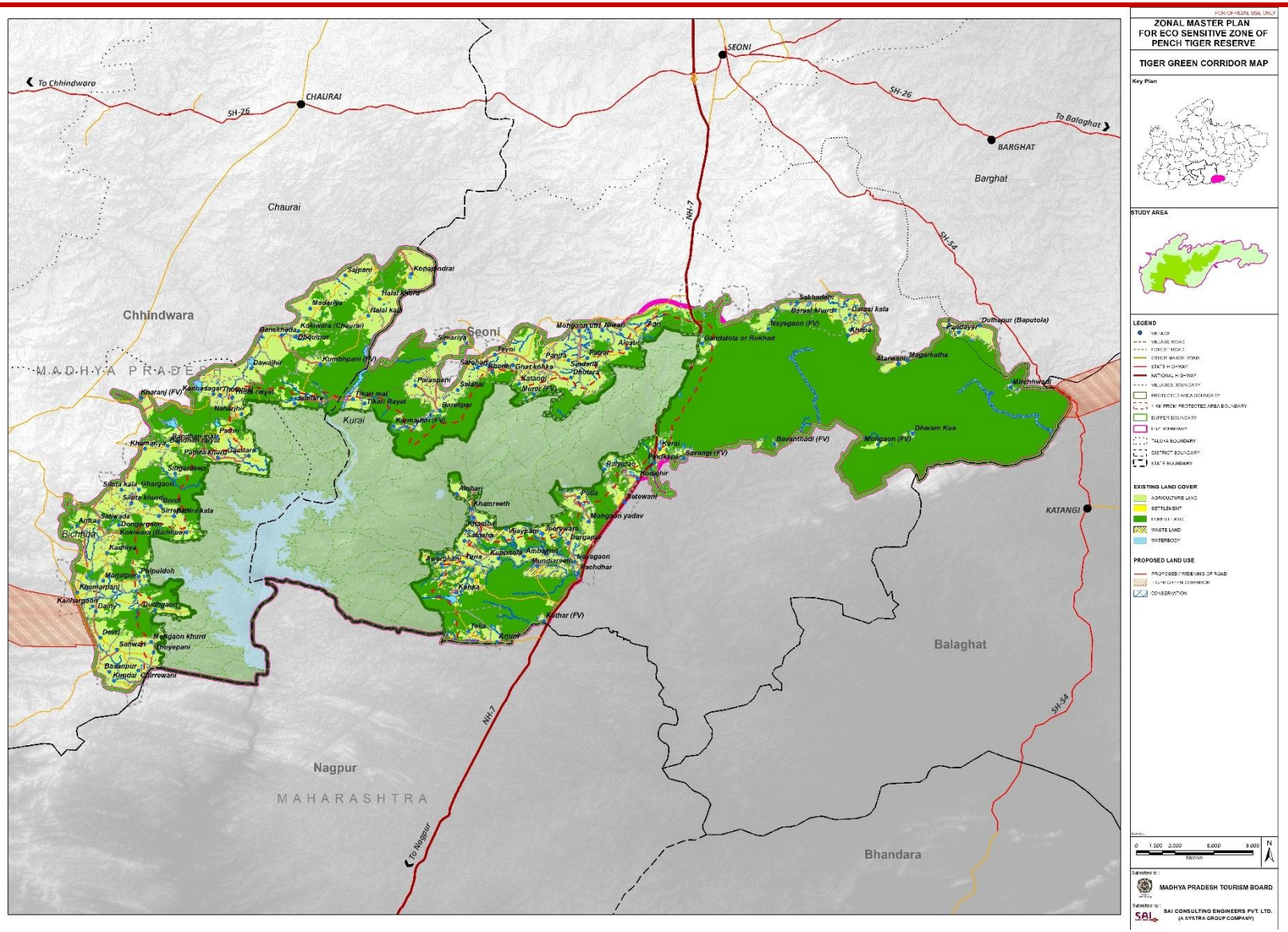


Figure 2. 6: Green corridor (Tiger)

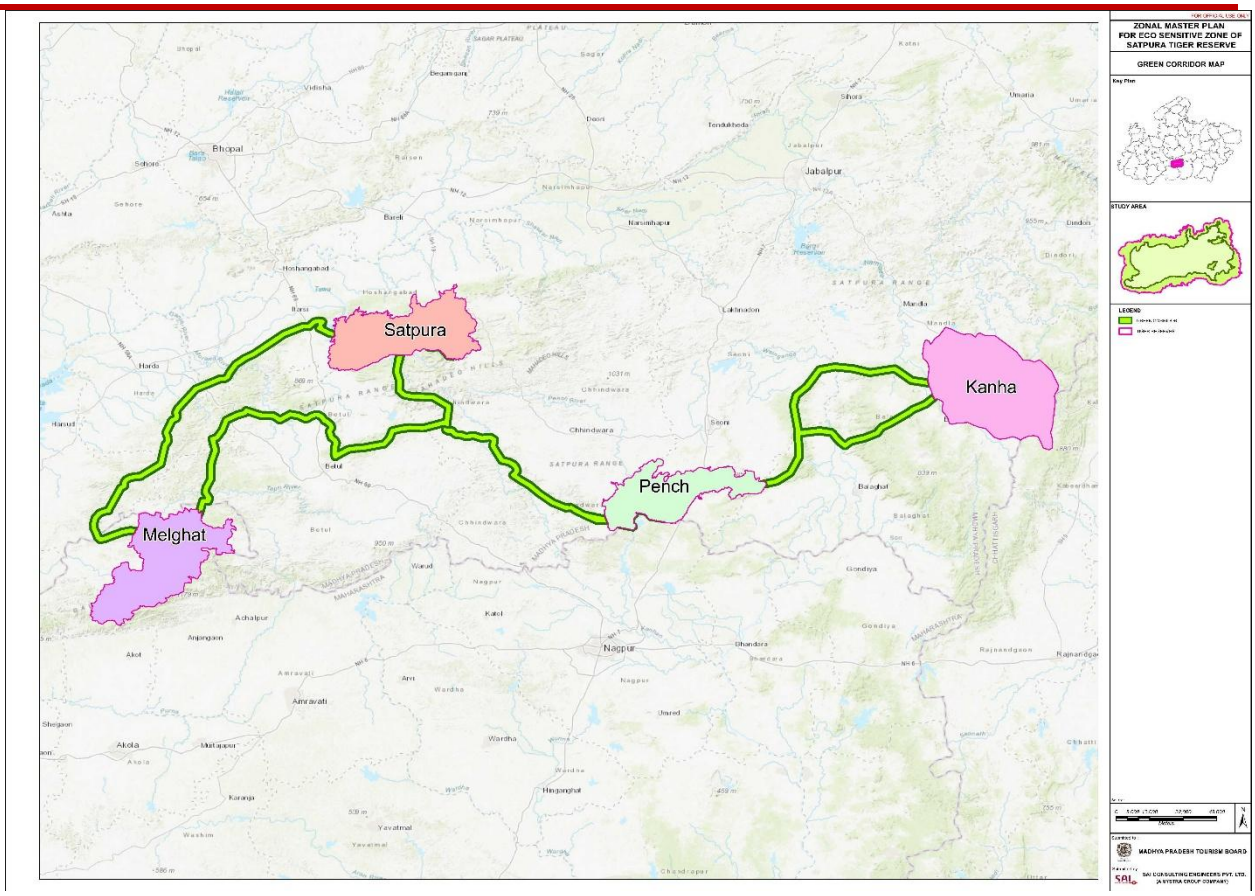


Figure 2. 7: Green corridors of PTR

1.2.2.3.1 Suggested Guidelines for the development of Hotels and resorts

Table 2- 2: Dos and Don'ts for the Development Hotels and Resorts

Sl.No	Do's	Don't's
	1.**Adhere to Fire Safety Protocols**: **Compliance with National Building Code (NBC) & Local Fire Safety Norms**: Ensure that the facility conforms to the fire safety provisions outlined in **NBC (Part 4)**, which covers aspects such as fire-resistance ratings, fire exits, fire suppression systems, and evacuation procedures. Install **automatic fire alarm systems (AFAS)**, fire extinguishers (portable and fixed), and **hydrant systems** in accordance with **BIS standards**. **Regular Fire Safety Audits**: Conduct periodic fire drills and inspections, as per **IS 14435** for fire safety audits, ensuring that all fire exits and fire alarms are operational, unobstructed, and easily accessible.	1.**Don't Violate Local Zoning or Environmental Laws**: **Illegal Construction**: Never undertake construction or expansion projects without obtaining necessary **zoning clearances** from local municipal corporations and state planning authorities. For projects in coastal or ecologically sensitive zones, **Coastal Regulation Zone (CRZ)** clearance is mandatory under the **Environment Protection Act (1986)**. **Environmental Violations**: Avoid polluting natural resources (water, air, soil) by discharging untreated effluents into rivers, lakes, or other water bodies, as such practices are strictly prohibited under **CPCB** regulations and **Environmental Protection Act**.

	Evacuation Plans: Maintain **fire evacuation floor plans** and emergency escape routes, updated quarterly. Fire evacuation drills must involve both staff and guests to ensure swift evacuation in case of emergencies.	
2	***Maintain Hygiene and Sanitation:*** **FSSAI Compliance for Food Safety**: Ensure compliance with the **Food Safety and Standards Act (2006)** and **FSSAI Regulations 2011**, covering food hygiene, storage, handling, and preparation. The food service operations must adhere to **HACCP** (Hazard Analysis Critical Control Points) principles. **Sanitation and Waste Management**: Implement **IS 2547** (guidelines for water quality standards) for potable water management and deploy **Wastewater Treatment Plants (WWTP)** that meet **Central Pollution Control Board (CPCB)** standards. Solid waste management protocols must follow **Municipal Solid Waste Management Rules (2016)** for segregation, recycling, and disposal. **Pest Control**: Ensure that pest control operations comply with **IS 6322** (pest management procedures). This includes regular inspections and safe chemical handling to avoid contamination.	***Don't Overcrowd Facilities or Rooms***: **Fire and Safety Overload**: Never exceed the room occupancy limits defined by fire safety norms. Ensure that occupancy per room adheres to the guidelines prescribed in **NBC (Part 9)**, which specifies minimum room sizes and the number of occupants per room. **Infrastructure Stress**: Avoid overloading electrical, plumbing, or HVAC systems beyond their designed capacity, as this can lead to system failures or safety hazards.
3	**Offer Environmentally Friendly Practices:** **Energy Efficiency Compliance**: Implement energy-efficient measures as per the **Energy Conservation Building Code (ECBC)**, which includes the use of **LED lighting**, high-efficiency HVAC systems, and renewable energy sources (e.g., **solar power systems**). **Water Conservation Standards**: Use water-saving devices like low-flow faucets, dual-flush toilets, and **rainwater harvesting systems** in compliance with **IS 1172** (for water conservation). All wastewaters should be treated in accordance with **CPCB guidelines**. **Green Building Standards**: Hotels and resorts should strive for **LEED (Leadership**	***Don't Neglect Waste Disposal or Pollution Control:*** **Improper Waste Management**: Disposing of hazardous waste (e.g., chemicals, oils, medical waste) in an improper manner violates **CPCB** norms and poses environmental and health risks. Proper waste segregation, storage, and disposal must follow **IS 14710** (solid waste management standards). **Non-Compliance with Water Treatment Norms**: Failure to treat wastewater and discharge untreated sewage into natural bodies is a violation of the **Water (Prevention and Control of Pollution) Act, 1974** and **CPCB guidelines**.

	in Energy and Environmental Design) certification or follow standards set by the **Indian Green Building Council (IGBC)**, focusing on reducing carbon footprints and adopting sustainable practices.	
4	***Ensure Accessibility for All Guests*** **Compliance with the Rights of Persons with Disabilities Act (2016)**: Ensure that the facility complies with the accessibility standards outlined in the **RPWD Act** for the design and operation of accessible pathways, elevators, and washrooms. **Barrier-Free Architecture**: Ensure that all public spaces are designed to be accessible to persons with disabilities, as per **IS 4873** for barrier-free design in buildings. **Signage Standards**: Install **universal signage** (braille, tactile indicators) as prescribed in **IS 11656** for accessibility.	***Don't Allow Unlicensed or Illegal Activities:*** **Illegal Activities**: Never host gambling events or allow illegal drug consumption on the premises, as this is prohibited under **The Public Gambling Act (1867)** and **Narcotic Drugs and Psychotropic Substances Act (1985)**. **Unlicensed Alcohol Service**: Serving alcohol without the proper **liquor license** (state-specific) is a serious violation of state excise laws and can lead to penalties or suspension of operations.
5	***Maintain Quality Customer Service:*** **Service Quality Standards**: Ensure that the service quality meets **ISO 9001** standards for customer service excellence, focusing on systematic feedback collection, grievance redressal mechanisms, and guest satisfaction surveys. **Employee Training**: Implement regular training sessions for staff according to industry best practices for hospitality management (e.g., **Service Excellence Programmes** based on **International Organization for Standardization (ISO 10002)**)	***Don't Ignore Guest Privacy and Security*** **Violation of Privacy Laws**: Sharing guest personal information without consent can lead to legal action under the **Information Technology (Reasonable Security Practices and Procedures) Rules 2011** and **PDPB** (once enacted). **Security Lapses**: Never fail to implement adequate security measures, such as CCTV surveillance (with proper consent and confidentiality protocols), secure access systems, and personnel checks for entry to sensitive areas like guest rooms.
6	***Comply with Local Laws and Regulations:*** **Licensing and Permits**: Adhere to the **Indian Hotels and Restaurants Act (1958)**, obtaining all necessary permits and licenses, such as liquor licenses, health and safety certifications, and tourism-related approvals from the **Ministry of Tourism**. **Noise Control**: Ensure compliance with the **Noise Pollution (Regulation and Control) Rules (2000)**, and maintain noise	***Don't Ignore Safety Standards*** **Failure to Comply with Safety Protocols**: Avoid ignoring building safety codes or delaying maintenance of safety systems such as **elevators, emergency lighting,** and **fire protection equipment**. Ensure compliance with the **Occupational Safety, Health and Working Conditions Code, 2020** for workplace safety. **Neglecting Structural Integrity**: Do not delay necessary repairs to structural elements (e.g., foundation, roof, load-bearing walls) in line with

	levels within permissible limits, especially in **Residential and Silence Zones**, as per the **Environment Protection Act (1986)**. **Data Protection**: Comply with data privacy laws like **Information Technology (Reasonable Security Practices and Procedures) Rules 2011** and protect guest data under **Personal Data Protection Bill (PDPB)**, once enacted.	**IS 3370** and **NDMA** guidelines, especially in high-risk zones (e.g., seismic zones).
7	***Regular Inspections and Maintenance*** **Building Maintenance**: Periodically conduct building safety audits in line with **IS 3370** (structural safety) and **IS 1180** (maintenance of buildings). Structural integrity assessments and repairs should be in compliance with the **National Disaster Management Authority (NDMA)** guidelines. **Preventive Maintenance Systems**: Implement a **Computerized Maintenance Management System (CMMS)** to track the performance and status of critical systems (e.g., HVAC, electrical, plumbing) and initiate preventive repairs.	

1.2.2.4 Areas for Eco-Restoration

1.2.2.4.1 Social and Agro Forestry

Social forestry can increase forest cover on government land and wastelands and densify cover on degraded lands. It focuses on managing forests for local community benefits, including forest management, protection, and afforestation of deforested areas. The goal is to meet the growing demands for timber, wood, food, and fuel while reducing pressure on traditional forests. Social forestry also protects agriculture, improves the environment, enhances natural beauty, and provides local resources. It aids wildlife habitats, soil conservation, and air quality, and can include activities like honeybee farming for both economic and environmental benefits.

Agroforestry combines tree planting with agricultural farming to offer landowners both tree products and agricultural goods. It provides benefits like shelter for animals, diversified income, improved soil and water health, and increased biodiversity. It also boosts productivity and ecological services. While social forestry is allowed in all ESZ areas, tourism and accommodation proposals in select locations could increase human disturbance and degrade the forest. Thus, compulsory social forestry is proposed for Mundiareeth, Ghatkohka, Dawajhir, Dongergaon, and Marjatpur.

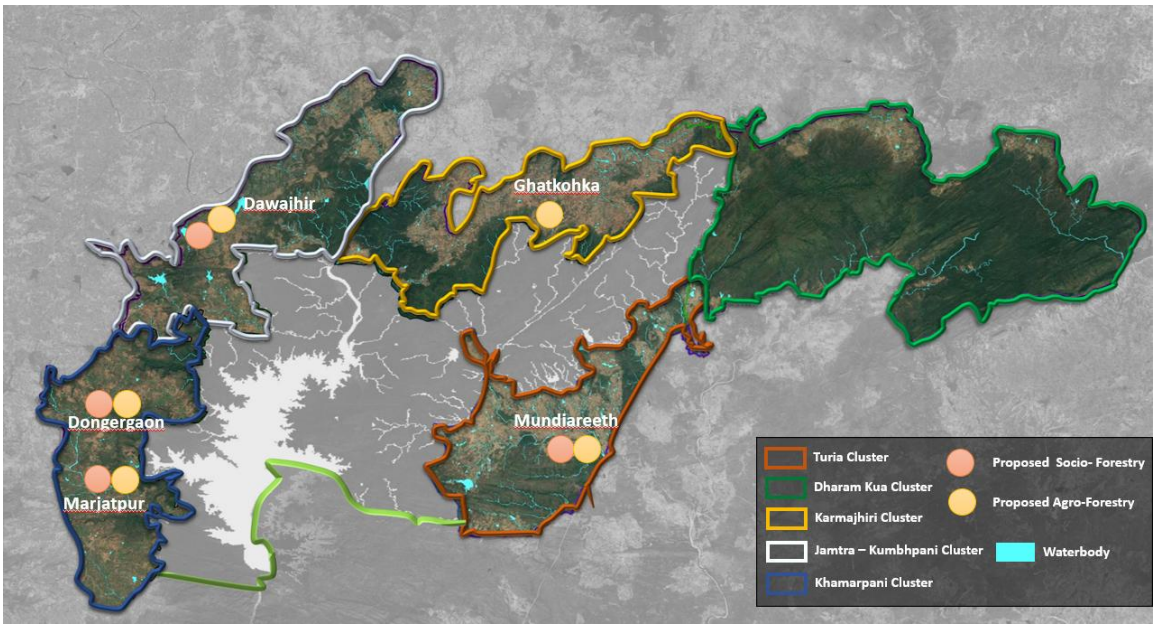


Figure 2. 8: Proposed Socio-Forestry locations

1.2.2.4.2 Miyawaki Forest Regrowth Methodology

For rapid growth in forest, Miyawaki forest methodology is suggested. Miyawaki method of tree plantation grows saplings 10 times fast and the forest is 30 times denser. In just 2 years the forest growth is unimaginable. Planation by using this methodology is done at various places in Bengaluru city to maintain the green cover patches. The Miyawaki method of reconstitution of "indigenous forests by indigenous trees" produces a rich, dense and efficient protective pioneer forest in 20 to 30 years, where natural succession would need 200 years in temperate Japan and 300 to 500 years in the tropics. Success requires compliance with the following phases:[1]

1. Rigorous initial site survey and research of potential natural vegetation.
2. Identification and collecting of a large number of various native seeds, locally or nearby and in a comparable geoclimatic context.
3. Germination in a nursery (which requires a technique for some species, for example, those that germinate only after passing through the digestive tract of a certain animal, or that need a particular symbiotic fungus, or a cold induced doming phase, etc.).
4. Preparation of the substrate if it is very degraded (addition of organic matter/mulch (for example with 3–4 kg of rice straw per square meter, to replace the protection afforded by surface humus and leaf litter) and (in areas with heavy or torrential rainfall) planting mounds for tap-root species that require a well-drained soil surface. Hill slopes can be planted with more ubiquitous surface roots species (cedar, Japanese cypress, pine, etc.)

[1] Miyawaki Forestry Research and Development (http://akiramiyawaki.com/)

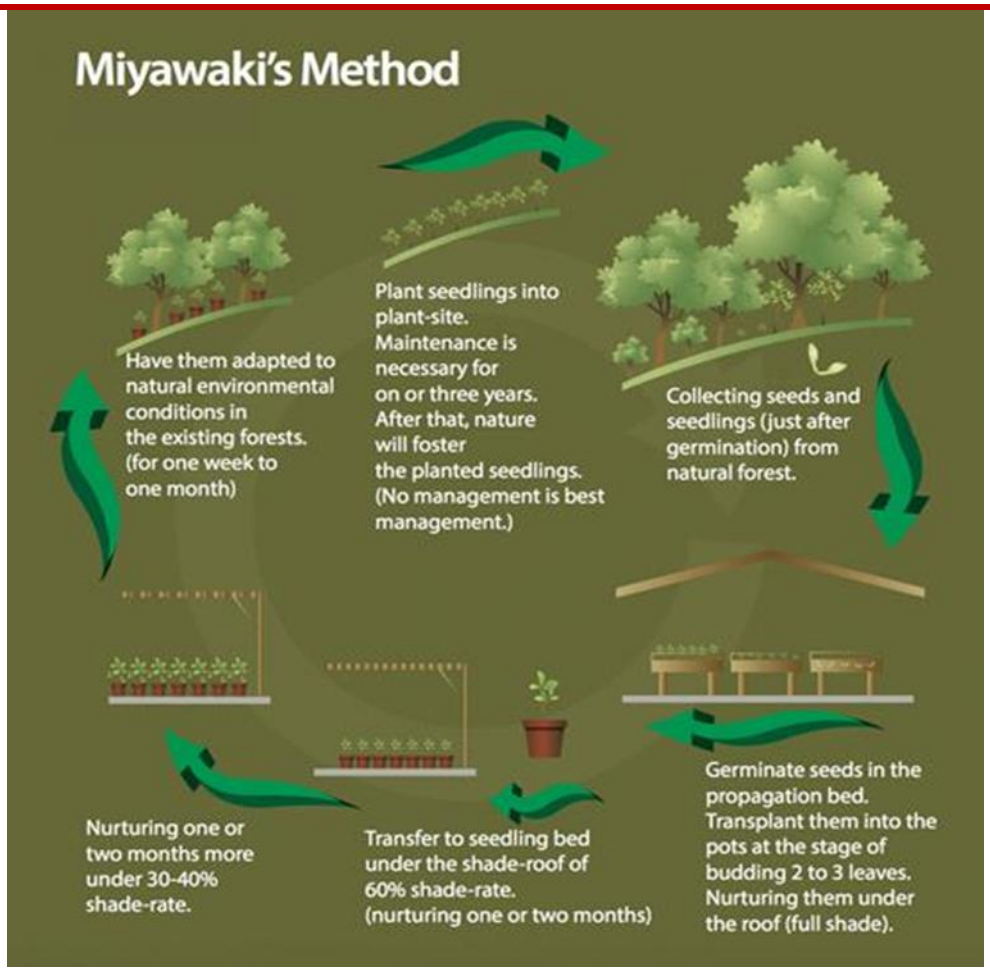


Figure 2. 9 Miyawaki Forest Methodology

Plantation respecting biodiversity inspired by the model of the natural forest. Miyawaki implements and recommends unusually dense plantation of very young seedlings (but with an already mature root system: with symbiotic bacteria and fungi present), for example 30 cm oaks from acorns, raised in a nursery over two years. Density aims at stirring competition between species and the onset of phytosociological relations close to what would happen in nature.

1.2.2.4.3 Bio-diversity Park

Located on central plateau of India, Pench Tiger Reserve has rich flora and fauna. Many Himalayan and Southern species of flora and fauna can be observed in Pench range. This biodiversity should be conserved with its natural habitat. With purpose to conservation of eco-system of region, Nature based eco-tourism and to spread awareness these ecological parks has been proposed in area of Mohgaon(FV), Karmajhiri, Halal Kala and Telia. These biodiversity parks are unique landscape of wilderness where ecological assemblages of native species in form of biological communities are recreated and maintained in a limited span of land. It helps to recreate the self-sustaining ecosystem with native flora and fauna. These parks can be benefitted for conservation of natural heritage and perseverance of threatened and endemic flora and fauna, hub for research activities and connecting biodiversity with local and outer community.

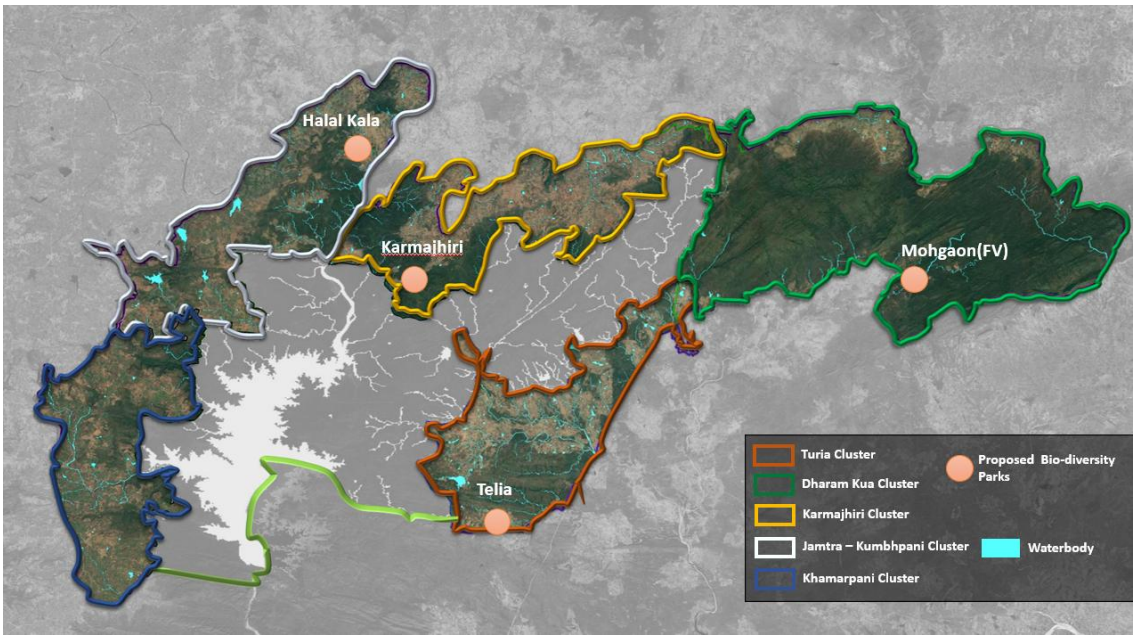
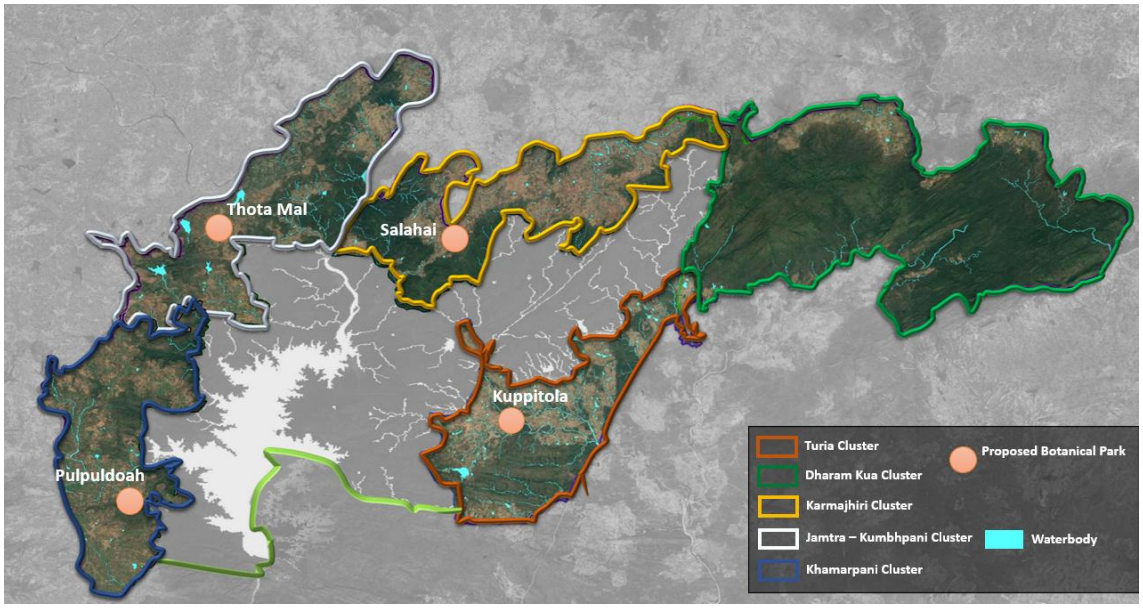


Figure 2. 10: Proposed potential Bio-diversity park locations

1.2.2.4.4 Botanical Park & Herbal Park

In 2019, Botanical Gardens Conservation Internationals defines a botanical garden having met a list of criteria, either in part of whole, such as: Having a reasonable degree of permanence, an underlying scientific basis for the collections, proper documentation of the collections, including wild origin, monitoring of the plants in the collections, adequate labelling of the plants, open to the public communication of information to other gardens, institutions and the public exchange of seed or other materials with other botanical gardens, arboreta or research institutions undertaking of scientific or technical research on plants in the collections maintenance of research programs in plant taxonomy in associate herbaria. These botanical gardens are dedicated place for the conservation and exhibition of different faunal diversities.



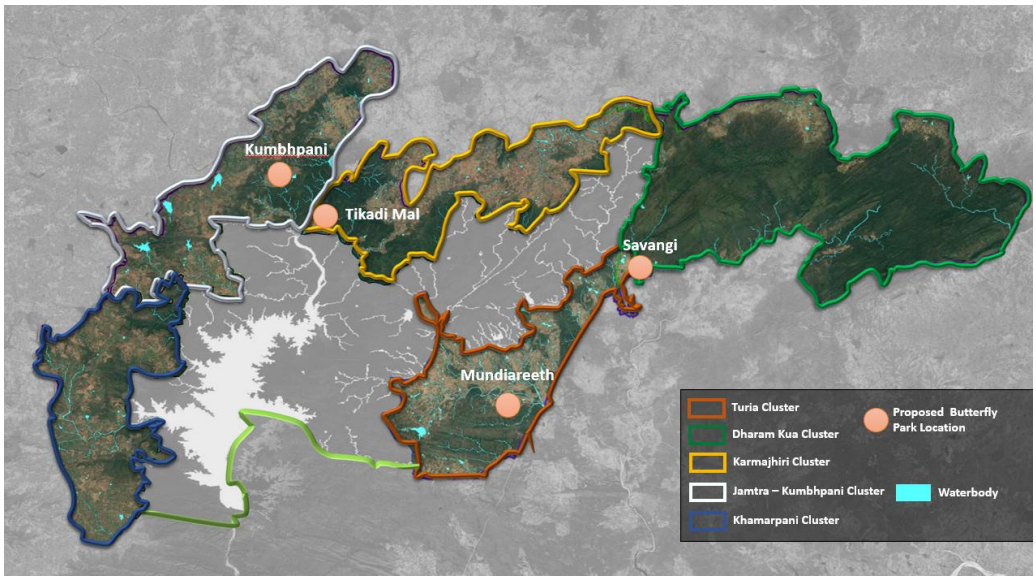


Figure 2. 12: Proposed potential location for Botanical Park and butterfly park

1.2.2.4.5 Arboretum

An arboretum is a botanical garden specializing in trees. Arboreta across the globe practice scientific research, promote conservation, and engage in public outreach and education to protect and preserve trees. There is a difference between arboretum and botanic garden. A botanic Garden means "garden with greenhouses for the culture, study and exhibition of special plants." It can have all kinds of plants: bushes, shrubs, bedding plants, flowers, vegetables, herbs, trees. Some of the ways in which plants can be arranged and featured include natural settings, fields, beds, around walkways, in ponds and in sitting areas. Greenhouses may be a part of the garden. They present opportunities to grow and display plants in climate-controlled areas so that exotic plants and plants that will not grow outside their native climates can be studied. While the arboretum means botanical garden containing living collections of woody plants intended at least partly for scientific study, but also to inspire curiosity and build knowledge about plants and wooded landscapes in order to enhance life, preserve nature, and advance sound stewardship practices." As per the updated data received from Forest Department dated 16/05/2025, Sakata village is renamed as Dharam Kua village.

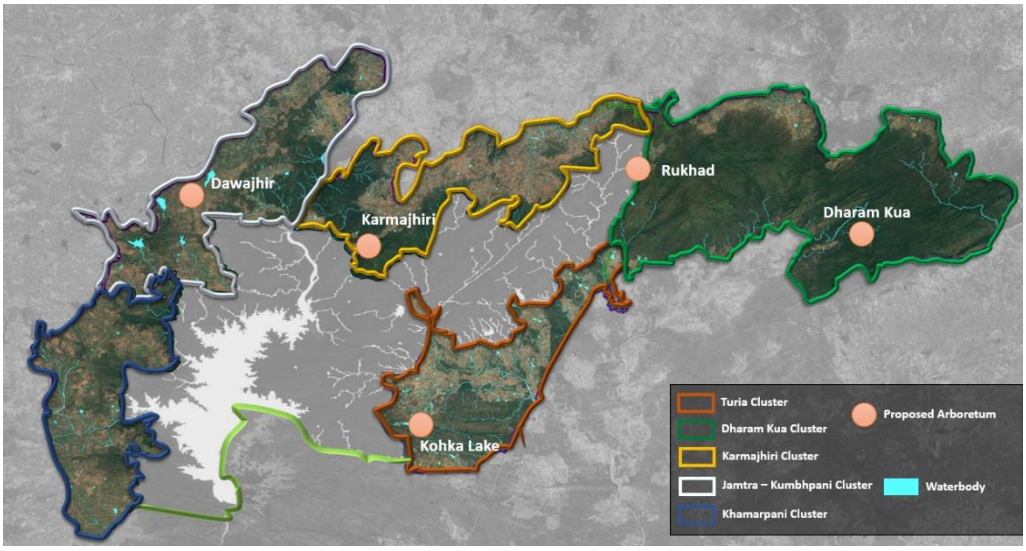


Figure 2. 13: Proposed Arboretum in PTR

1.2.2.4.6 Animal Passageway

Improvements and proposals of roads are provided to improve communication between villages, tourism sites and outer centers is proposed in PTR. Many roads are newly proposed or widen for betterment of connectivity through vehicles in PTR. These linear infrastructures may be disturbing to wildlife and its habitats in the area and movement of animals from one place to another place. The proposed structures are based on animal occupancy in area, availability of forest, type of forest and risk zones for animals. To reduce these disturbances to animal movements and their habitats conservation measures like providing dense tree cover on road sides to prevent noises of roads, structures like canopy bridges, glider poles, box culverts with managed green covers and fences, pipe culverts and signages for animal passage ways.

1.2.2.4.7 Poaching

To reduce the poaching in PTR, a strict patrolling should be carried out in sensitive zones for the poaching. The use of technologies like Cameras, Drones, Thermal Cameras, SMART and other suitable surveillance & management methodologies should be adopted. The fencing for sensitive area with alarm should be done to stop the poaching incidents. The support from village people can be helpful for information of poaching and animal protection. Villagers should be provided training and awareness about wildlife, their importance and values.

1.2.3 Theme plans

1.2.3.1 Restoration of Soil Moisture Regime and Land Conservation

Table 3- 1: Soil nutrients in PTR

Sr NO	Soil Nutrients	District	Condition
1	Nitrogen	Seoni	Medium
		Chhindwara	Medium
2	Phosphorous	Seoni	Very low
		Chhindwara	Low
3	Potassium	Seoni	Medium
		Chhindwara	High

(Source: Soil health card: https://soilhealth7.gov.in/)

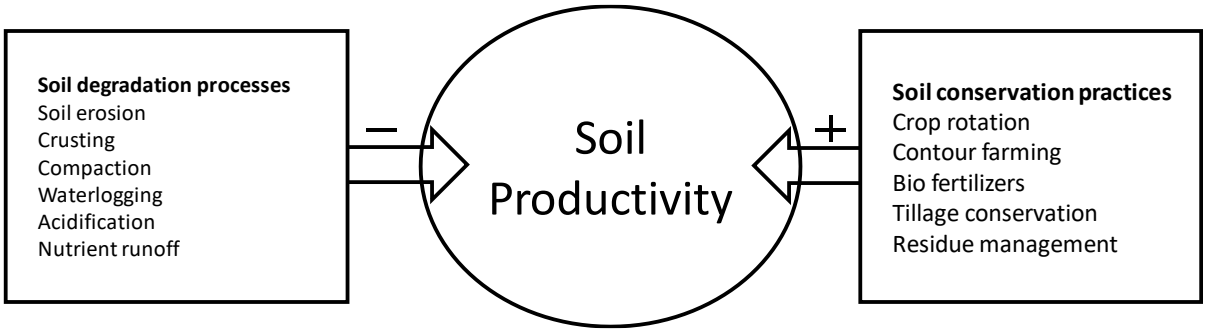


Figure 3. 1: Soil degradation and conservation

1.2.3.1.1 Suggestive measures for Soil conservation in Eco-Sensitive region

Soil conservation in Eco-Sensitive Zones (ESZs) is crucial due to the delicate balance between natural ecosystems, biodiversity, and human development. These zones often include forests, wetlands, and other natural habitats that are vulnerable to soil erosion, degradation, and other environmental pressures. Soil conservation strategies should therefore be context-specific, considering both the ecological and socio-economic aspects of the region:

1. **Vegetative Cover Enhancement**

- *Afforestation and Reforestation:* Planting native tree species can significantly reduce soil erosion by stabilizing the soil with root systems. Vegetation also improves water retention and reduces surface runoff, preventing soil loss. *For Example: In the Western Ghats (India), reforestation with native species like Shorea robusta (Sal tree) and Tectona grandis (Teak) has been shown to restore soil structure and prevent erosion.*
- *Agroforestry Systems:* In ESZs where agriculture is practiced, agroforestry (growing trees alongside crops) can help improve soil health. Trees such as *Acacia* and *Leucaena* are used to control erosion and provide shade to crops. *For Example: The integration of agroforestry practices in the Nilgiri Hills has reduced soil erosion in coffee and tea plantations.*

2. **Terracing and Contour Farming**

- *Terracing:* Constructing terraces on sloped land can reduce the velocity of surface water flow, thus minimizing erosion and water runoff. It's especially effective in hilly and mountainous regions of ESZs. *For Example: In the Himalayas, terracing has been adopted in areas like the Kumaon region to manage soil erosion and enhance agricultural productivity*.
- *Contour Plowing:* This technique involves plowing along the contours of the land rather than up-and-down slopes, which helps to slow down water runoff, reduce soil erosion, and conserve moisture. *For Example: The practice has been implemented effectively in the Eastern Ghats to prevent soil erosion in agricultural lands.*

3. **Check Dams and Water Harvesting Pits**

- *Check Dams*: Small dams built across seasonal streams help in reducing soil erosion by trapping water and sediment. These structures can also provide water for irrigation in areas prone to drought. *For Example: In the Kutch region of Gujarat, check dams have been used to combat desertification and enhance soil fertility.*
- *Water Harvesting Pits*: Creating small ponds and water harvesting pits at strategic locations can capture runoff, enhance groundwater recharge, and reduce soil erosion. *For Example: In arid regions of Rajasthan, water harvesting pits have been effective in restoring soil moisture and preventing wind erosion.*

4. **Mulching and Ground Cover Crops**

- *Mulching:* Applying a layer of organic or inorganic material on the soil surface can help reduce evaporation, control weeds, and minimize soil erosion. Mulching also improves soil fertility as organic matter decomposes over time. *For Example: In tropical rainforests, using leaf litter or grass mulch in agricultural zones has helped in maintaining soil moisture and reducing erosion*.
- *Ground Cover Crops:* Planting cover crops like legumes, grasses, or other ground covers can prevent soil erosion, enrich soil nutrients, and restore soil health in the ESZs. *For Example: The use of Crotalaria species as cover crops in parts of Southeast Asia has reduced erosion and improved soil quality.*

5. **Livestock Management and Grazing Control**

- *Controlled Grazing:* Overgrazing by livestock is one of the primary causes of soil degradation in ESZs. Implementing rotational grazing systems and limiting the number of livestock in sensitive areas can protect vegetation and prevent soil erosion. *For Example: In the Andean regions of South America, rotational grazing has been shown to prevent soil compaction and maintain vegetation cover.*
- *Exclosure Zones:* Designating certain areas as "exclosure zones" where livestock and human activities are restricted can help regenerate native vegetation, which in turn stabilizes the soil. For *Example: In Mongolia, exclosure zones have been used to restore grasslands and improve soil quality.*

6. **Erosion Control Structures**

- *Erosion Barriers and Windbreaks*: Constructing physical barriers such as stone walls, gabions, or planting hedges can help control water and wind erosion in vulnerable ESZs. *For Example: In the arid regions of central Asia, windbreaks made from native shrubs have reduced wind-induced soil erosion and dust storms.*
- *Check Dams and Silt Traps*: Small structures designed to trap sediment and slow down water flow can be placed strategically along vulnerable waterways to prevent downstream erosion. For *Example: In the hilly regions of the Western Ghats, small silt traps built along streams have helped reduce sedimentation in nearby rivers.*

7. **Community-Based Soil Conservation Practices**

- *Participatory Approaches:* Involving local communities in soil conservation efforts is critical. Community-based initiatives that combine traditional knowledge with modern practices can result in more sustainable outcomes. *For Example: In the Nilgiri Biosphere Reserve, community participation in reforestation and soil conservation has led to the successful rehabilitation of degraded lands.*

1.2.3.1.2 Hills and Mountains

The suggested measures for slope stability can be implemented in the ground for conservation measures. The Following measure are:

1. **Slope Grading and Reshaping**
   - *Regrading*: Regrading involves modifying the existing slope angle to a less steep gradient, which reduces the likelihood of erosion and mass wasting (such as landslides). This technique is often used when slopes are too steep for safe development or for conserving the area. Typically, the slope angle is reduced to between 15° and 30°, depending on soil conditions and surrounding landscape.
   - *Terracing:* In hilly or mountainous terrain, terraces are created by cutting horizontal steps into the slope. This process can significantly reduce water runoff, improve water retention in the soil, and prevent soil erosion. Each step effectively acts as a barrier, slowing down water flow and reducing its erosive force. Terraces also make agricultural practices viable in otherwise unstable slopes.
   - *Benching:* This is similar to terracing but involves creating multiple horizontal steps or benches along a slope. Each bench acts as a small terrace, with a focus on stabilization through the containment of soil.
2. **Vegetative Cover and Soil Protection**
   - *Revegetation (Reforestation and Grass Cover):* The introduction of native vegetation helps bind the soil with their root systems, reducing soil erosion. Trees, shrubs, and grass not only protect the soil but also provide ecological benefits such as habitat creation, carbon sequestration, and water retention. It is important to use native plants that are adapted to the local environment for better survival rates and ecosystem integration.
   - *Hydroseeding and Mulching:* When establishing vegetation on a slope, hydroseeding is a method where a mixture of seed, mulch, and water is sprayed on the slope. This method speeds up the establishment of ground cover. Mulching, either through organic materials like straw or synthetic mats, also helps protect newly planted vegetation from harsh weather conditions, reduces evaporation, and prevents soil erosion.
   - *Cover Crops:* Short-term cover crops (such as legumes) are used to protect slopes during the establishment of longer-term vegetation. They quickly grow and provide cover to prevent soil loss, improving soil fertility as well.
3. **Erosion Control Measures**
   - *Geotextiles and Geogrids:* Geotextiles (woven fabrics) and geogrids (grid-like structures) are placed on slopes to reinforce the soil and prevent erosion. These materials are used to stabilize loose soils by providing a physical barrier to soil movement and erosion while allowing water to pass through. Over time, they support vegetation growth, which further stabilizes the slope.
   - *Riprap (Rock Armor):* Riprap involves placing large, angular rocks along the slope, especially at the base where water runoff tends to concentrate. The rocks absorb the force of the water, preventing soil erosion. Riprap is particularly effective in areas exposed to heavy rainfall or runoff. The rocks should be chosen carefully to ensure they are stable and capable of withstanding the force of the water flow.
   - *Check Dams and Silt Fences:* Small check dams or silt fences are installed at key points on the slope to catch water and sediment, allowing it to settle before runoff reaches critical areas. Silt fences, often made of porous fabric, prevent soil from eroding into nearby watercourses, and they also help in sedimentation control.
4. **Drainage Control**
   - *Surface Drainage Systems:* Proper drainage systems are designed to direct surface water away from slopes, preventing water from accumulating and destabilizing the soil. Swales, channels, or berms are commonly used to redirect water flow to safe discharge points. Adequate drainage is essential to reduce the risk of waterlogging and subsequent slope failure.
   - *Subsurface Drainage (French Drains, Weeping Tile):Subsurface drainage involves the installation of perforated pipes (French drains) or other drainage materials below the soil surface to redirect groundwater. These systems reduce the accumulation of water in the slope's soil, which could otherwise cause landslides. It's particularly effective in clay-rich soils that retain moisture and are prone to slipping under heavy rain.*

- *Infiltration Pits:These are used to absorb excess water on-site. They consist of dug pits filled with gravel or similar material to allow rainwater to slowly seep into the ground, thus relieving pressure from surface runoff and preventing erosion.*

5. Use of Retaining Structures

- *Retaining Walls*: Retaining walls are constructed to stabilize a slope and hold back soil, especially in places where the natural slope is too steep for construction or vegetation. There are various types of retaining walls:
- *Gravity Walls*: Use their mass to resist pressure from soil.
- *Cantilever Walls:* Use a slab base to resist lateral pressure from the soil.
- *Counterfort Walls:* Have internal braces or counterforts to increase stability. Retaining walls can be made of concrete, stone, or modular blocks, and are often combined with vegetation to enhance aesthetics and reduce erosion.
- *Gabion Walls*: Gabions are wire mesh baskets filled with stones, often used to stabilize slopes in areas exposed to heavy water runoff. The flexibility of gabions allows them to adjust to shifting soil without failing, making them ideal for dynamic environments such as riverbanks or coastal cliffs.
- *Soil Nail Walls:* This method involves inserting steel rods or nails into the slope at a downward angle, followed by the application of mesh or shotcrete (sprayed concrete). This creates a reinforced structure that holds the soil in place, preventing slippage or erosion.

6. **Slope Monitoring and Maintenance**

- *Geotechnical Monitoring Systems*: Installation of sensors or inclinometers that measure ground movement and detect early signs of slope instability. These sensors can detect changes in soil moisture, displacement, or tilting, which can trigger warning systems or early mitigation efforts.
- *Regular Inspections:* Slopes need to be monitored continuously, especially after significant rainfall, construction activities, or natural events like earthquakes. Maintenance crews should inspect structures, drainage systems, and vegetation regularly, and perform repairs to any erosion protection measures or retaining structures that are showing signs of wear or damage.
- Emergency Response Plans: Having a predefined emergency plan in place to deal with any slope failure is essential, particularly for densely populated areas or locations with significant infrastructure.

7. Legal and Regulatory Framework

- Setbacks and Zoning Regulations: Zoning regulations often dictate that construction be limited on unstable slopes or be set back a certain distance from the top or bottom of the slope. These regulations are designed to reduce the pressure on slopes, prevent disturbances that could lead to destabilization, and minimize the risk of landslides or subsidence.
- Environmental Impact Assessments (EIA): Before any major construction or development on slopes, an EIA should be conducted to assess the potential risks to slope stability. The assessment helps identify the best course of action for maintaining slope integrity and preventing environmental degradation.
- Government and Local Policy on Slope Safety:Many governments and local authorities impose building codes and regulations that specifically address slope safety. These can include limits on excavation, requirements for erosion control during construction, and mandatory soil testing.

8. Community Involvement and Awareness

- *Community-Based Monitoring Programs*: Engaging local communities in monitoring slope stability can provide early detection of changes, such as unusual erosion patterns or signs of soil displacement. Local residents often have firsthand knowledge of the area's environmental conditions and can help identify potential risks.
- *Education and Training Programs:* Educating landowners, developers, and local communities on best practices for slope conservation and sustainable land use can go a long way in preventing damage. Workshops, outreach programs, and awareness campaigns can teach techniques like reducing deforestation, managing water flow, and planting vegetation.

- *Sustainable Land Use Practices:* Encouraging sustainable land-use practices, such as avoiding overgrazing, minimizing soil compaction, and using agroforestry methods, helps ensure that slopes remain stable and ecosystems are preserved.

1.2.3.1.3 Conservation through Agriculture

Conservation Agriculture focuses on soil management practices that preserve soil structure, composition, and biodiversity. Its core principles include maintaining soil cover (using crop residues or cover crops), minimizing soil disturbance through minimal tillage, and implementing crop rotations to manage biotic challenges.It also promotes green manures, no burning of crop residues, integrated pest and disease management, limited soil traffic, and the use of bio-fertilizers and bio-pesticides. These practices reduce fossil fuel use, greenhouse gas emissions, and the energy needs of farmers.

In addition to conservation agriculture, practices like double cropping, contour farming, soil stabilization in hill areas, and minimizing chemical fertilizers and pesticides are also essential.

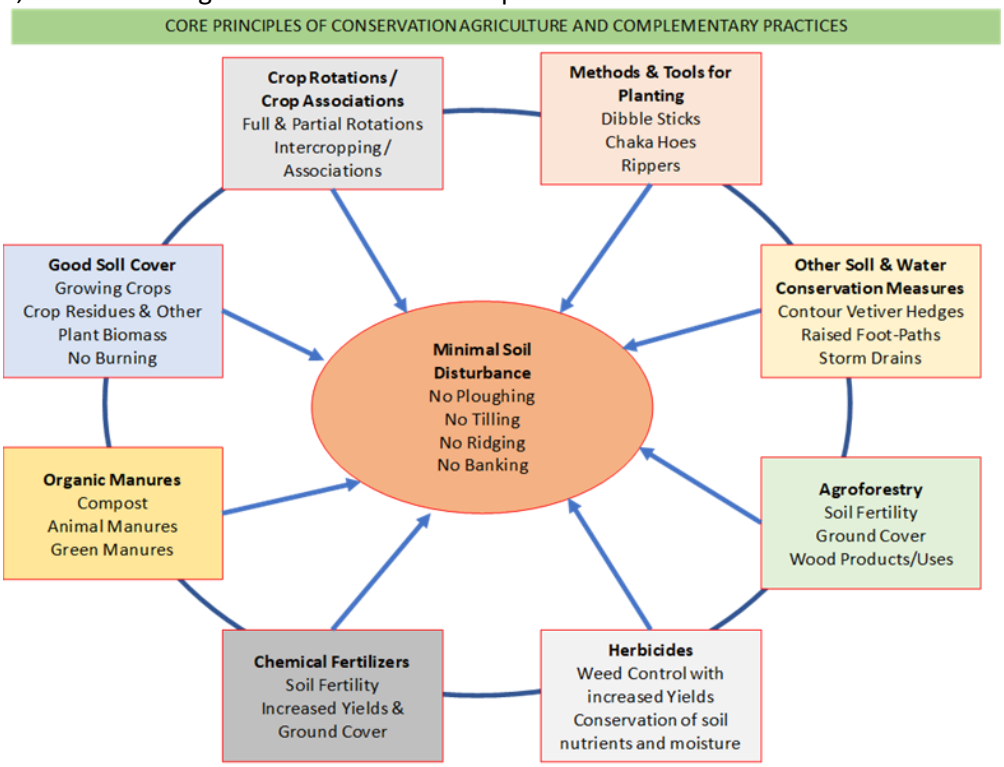


Figure 3. 2 Conservation Agriculture Practices

1.2.3.2 Rainwater harvesting

Rainwater harvesting is the technique of collection and storage of rainwater at surface or in sub-surface aquifers, before it is lost as surface run-off. The augmented resource can be harvested in the time of need. Artificial recharge to ground water is a process by which the ground water reservoir is augmented at rate exceeding that under natural conditions of replenishment.

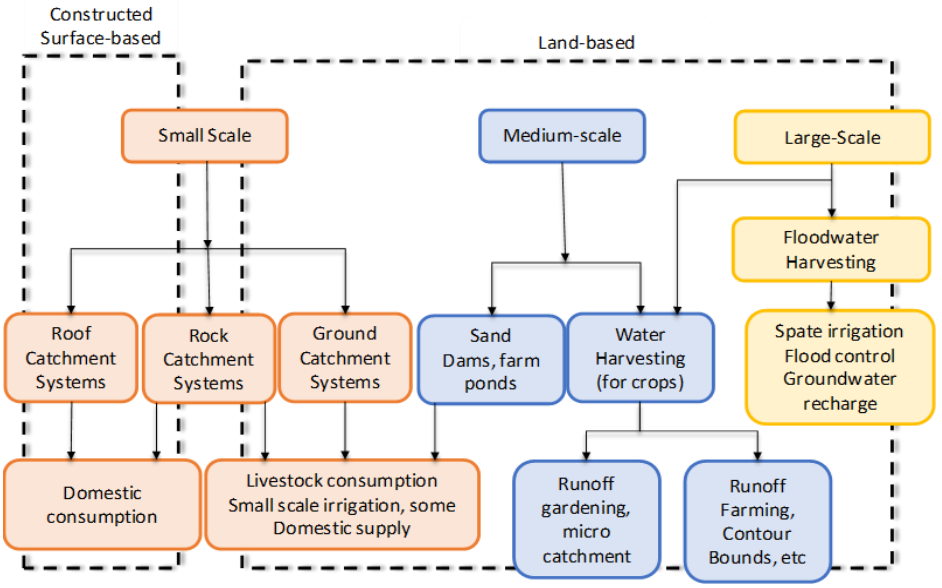
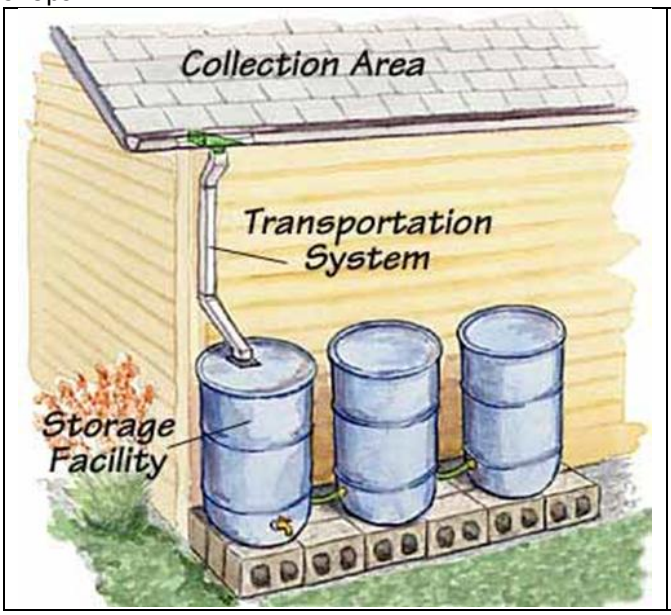


Figure 3. 3: Rainwater Harvesting Techniques

Different methodologies serve different purposes for rainwater harvesting. For domestic purpose only, small scale methods like rainwater harvesting, catchments like khet talab and ground catchments are useful. Medium scale and large scale are mainly land based and helpful for agriculture purposes. For recharge of ground water level, different methods are discussed in above section- 8.3.2. Based on available rooftop area and rainfall rainwater harvesting can be done as per IS 15797: 2008.

1.2.3.2.1 Roof top rainwater harvesting

Rooftop rainwater harvesting is very common and widely used method for rainwater harvesting. In many water scarce regions, it is helpful to develop an individual water source for domestic usage. This method should be promoted through various government schemes in all 108 notified villages of PTR. Average harvested water depends upon roof area and rainfall. This rainwater harvesting method should be compulsorily developed in the Local residents, education centres and lo hotels, resorts and commercial shops.



Roof catchment systems are small-scale constructed-surface based rainwater harvesting systems. It is perhaps most common in urban areas where the rainwater is collected from suitable roofs of buildings. The water is lead in gutters or pipes into a storage tank in a variety of shapes, sizes and materials. The water from this kind of systems is in general good for consumption by humans but may have restrictions in capacity.

Figure 3. 4 Roof-top rainwater Harvesting System

1.2.3.2.2 Rainwater harvesting through Runoff gardens / landscaping

As the area is proposed with accommodation for tourists like resorts, hotel, cottages and other public buildings with having large area, it is compulsory to develop a rainwater harvesting system in building unit. This method for rainwater harvesting is useful for these large-scale buildings with having open areas and gardens. This rainwater harvesting method should be compulsorily developed in the ESZ area majorly in Residential, Hotel, resorts and Public&Semi Public places (Schools, colleges, government offices).

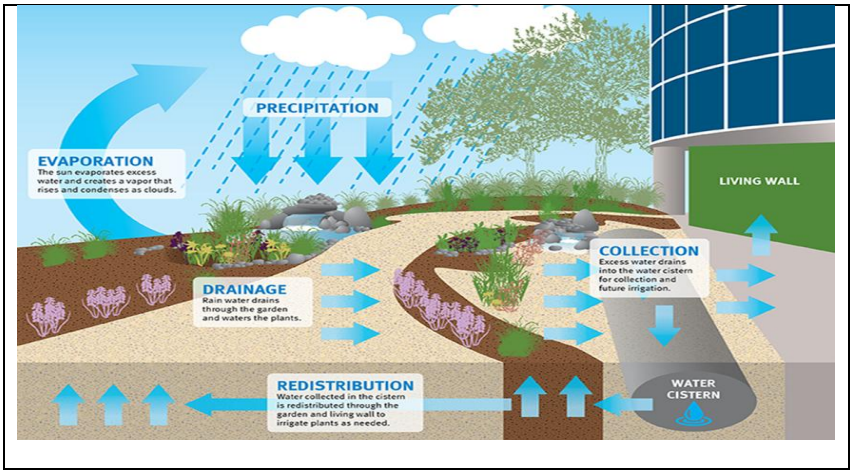


Figure 3. 5:Rain-water Harvest through Gardens

1.2.3.2.3 Farm Ponds / Percolation ponds

Agriculture is the prime activity in Eco-Sensitive zone villages. To collect and store water from agriculture, this is the common practice of Fam pond is popular. It helps to irrigate the farms for short season, but also helps to recharge the ground water in area. This practice can be helpful in agriculture fields and surrounding area for using water for irrigation purpose only.

Figure 3. 6: Farm ponds / Percolation ponds

Farm ponds are established close to the farming fields and can be classified as a medium-scale, land-based harvesting system. The water in these ponds is commonly only suitable for irrigation and animals because of contamination possibilities. Water from surrounding hills and slopes run in natural or constructed trenches into a prepared excavation in the ground close to the farming fields.

As discussed above, all methodologies for rainwater harvesting can be proposed as per suitability. The advantages and disadvantages for rainwater harvesting is as shown in below table 8.4.

Table 3- 2: Advantage and Disadvantages for Rainwater harvesting

Advantages		Disadvantages	
Short distance	The water come your home, which saves time and effort in collecting from a far.	**Limited supply**	The size of the catchment area and tank limits the supply. Also the budget is a big limiting factor.
Simple construction	Construction of systems is simple, and locals can easily be trained to construct and install components.	**High investment cost**	The cost of the systems is almost fully incurred during the initial construction. Financial management and down payment plans are often needed
Independent	Operation and maintenance of a household catchment system is not dependent on management from outside the family.	**Maintenance**	Proper maintenance is often neglected. Regular inspection, cleaning and occasional repair is essential.
Relatively good water quality	Rural rainwater is clean and is good for drinking provided that the system is operated properly.	**Vulnerable quality**	The water may easily be polluted if the system is not kept clean and in proper condition.
Environmental impact	Rainwater is a renewable resource, and no damage is done to the environment.	**Sensitive to droughts**	Rain is often unpredictable, and large tanks are needed if the water is to last the entire drought.

1.2.3.3 Wastewater Treatment

Along with water supply in rural area, wastewater management is one of the key issues. Due to lack of wastewater management, currently all the domestic wastewater is directly disposed to the nearby waterbody without any treatment.

There are only villages having drainage system in the villages are, Karmajhiri, Simariya, GhatKohka, Katangi, Murer, Panjra, Sindaria, Dhutera, Pindkapar, Nayagaon, Sakhadehi, Darasi Kala, Savangi, Khapa, Atarwani, Pandyer, Dharam Kua, Banskheda, Kumbhpani, Kanhasagar, Bandhan Mal, Pathra Khurd, Madariya, Pulpuldoah, Khamarpani and Kanhargaon.

Remaining villages of ESZ is to be covered with drainage system.

Wastewater is to be collected through drainage system and is to be treated and then can be disposed to nearest waterbody or can be reuse in agricultural activities. Village wise wastewater generation along with carrying capacity is shown in table below.

Table 3- 3: Village wise Wastewater Generation:

Sr. No.	Village	2011	2021	2031	Waste Water Generation
1	Atarwani	442	517	619	50141
2	Bavanthadi (FV)	98	123	152	12796

Sr. No.	Village	2011	2021	2031	Waste Water Generation
3	Darasi kala	686	793	908	70396
4	Darasi khurd	1054	1147	1257	93676
5	Dulhapur (Baputola)	1539	1789	2079	198035
6	Gandatola or Rukhad	372	426	489	38002
7	Kharaj(FV)	177	192	208	15305
8	Magarkatha	226	310	427	39136
9	Mirchhwadi	47	41	33	1749
10	Mohgaon (FV)	131	146	162	12183
11	Nayegaon (FV)	580	689	842	69359
12	Pandayer	403	452	497	36900
13	Dharam Kua (FV)	93	104	117	8913
14	Sakhadehi	605	629	619	40597
15	Savangi (FV)	259	334	426	36753
16	Ambajhiri	898	1015	1131	85425
17	Ambari	400	473	552	43650
18	Arjuni	281	320	364	28027
19	Awarghani	392	474	571	46514
20	Durgapur	259	434	769	101245
21	Jeerewara	786	865	931	67751
22	Khamreeth	133	165	210	17808
23	Khapa	669	852	1065	90990
24	Kodajhir	849	946	1054	79671
25	Kohka	794	908	1023	78033
26	Kothar (FV)	111	134	167	14083
27	Kuppitola	363	403	433	94914
28	Kurai	1927	2327	2746	220379
29	Mohgaon yadav	801	909	1057	83450
30	Mundiareeth	368	414	457	34151
31	Nayagaon	501	577	654	50284
32	Pachdhar	678	771	848	63193
33	Pindkapar	2090	2270	2378	167573
34	Potia	1029	1202	1380	107318
35	Raiyarao	341	354	344	22100
36	Satosha	561	673	802	64539
37	Setewani	717	866	1083	91064
38	Telia	805	872	921	65623
39	Turia	1999	2361	2785	285590
40	Vijaypani	606	690	767	57782
41	Agri	327	437	584	52307
42	Alesur	486	510	529	37135
43	Barelipar	408	476	543	54468
44	Bhodki	163	181	202	15263
45	Dhutera	646	723	799	59792
46	Ghat Kohka	945	1075	1199	90513

Sr. No.	Village	2011	2021	2031	Waste Water Generation
47	Karmajhiri (FV)	245	285	335	26576
48	Katangi	356	379	390	26983
49	Mohgaon titri	548	606	662	48961
50	Murer (FV)	63	71	77	5609
51	Niwari	135	143	143	9527
52	Panjra	213	248	288	34392
53	Paraspani	696	767	838	73839
54	Patrai	826	893	967	71037
55	Salahai	304	345	407	32754
56	Sarahari	800	888	966	71980
57	Simariya	783	958	1191	99529
58	Sindaria	560	619	684	51218
59	Tevni	470	497	523	37391
60	Tikari mal	414	503	609	49792
61	Tikari Rayat	215	218	219	15391
62	Bandhan mal	724	852	984	77012
63	Bandhan raiyat	235	280	338	27636
64	Banskheda	1357	1565	1787	146729
65	Dawajhir	278	324	374	29265
66	Dhoulpur	373	442	507	39684
67	Gumtara	1765	2049	2351	182536
68	Halal kala	869	992	1136	88174
69	Halal khurd	910	1099	1308	105466
70	Jamtara	906	1015	1116	82946
71	Kanhasagar	307	428	593	57561
72	Khamariya	1014	1261	1571	131756
73	Kmamba	431	539	679	57397
74	Kokiwara	260	294	326	24441
75	Konapindrai	1171	1327	1468	109943
76	Kumbhpani (FV)	316	326	318	20588
77	Madariya	920	1058	1221	95363
78	Naharjhir	288	332	371	28151
79	Pathra khurd	151	173	187	13859
80	Pathri	1076	1242	1415	109207
81	Sajpani	1529	1856	2224	180515
82	Singardeep	493	646	836	73425
83	Thota raiyat	70	72	83	6621
84	Thotamal	1064	1245	1433	111711
85	Antra	269	318	379	30630
86	Basanpur	374	413	452	33567
87	Bordi	279	335	394	31433
88	Chirrewani	659	668	650	42048
89	Dainy	629	670	702	49706
90	Devri	1080	1183	1289	95208

Sr. No.	Village	2011	2021	2031	Waste Water Generation
91	Dongargaon	286	351	423	34630
92	Dudhgaon	1279	1478	1673	128280
93	Ghargaon	409	503	627	52545
94	Kadhiya	1208	1346	1495	112589
95	Kanhargaon	683	726	760	53822
96	Khamarpani	2325	3089	4046	363456
97	Kokiwara	506	581	646	48698
98	Kundai	825	981	1155	92012
99	Marjatpur	662	748	845	64691
100	Mohgaon Khurd	238	318	422	37808
101	Pathra kala	337	409	487	39382
102	Pulpuldoh	1015	1187	1353	104600
103	Saliwada	413	517	640	53624
104	Sanwari	1114	1292	1496	117271
105	Silota kala	521	592	674	52000
106	Silota khurd	277	357	451	38990
107	Sirrepani	613	763	960	81082
108	Thuyepani	911	989	1043	74151

Source: RADPFI Guidelines

*Highlighted texts indicate the villages in which accommodation facilities has been proposed and the tourist carrying capacity has been considered in calculations.

Based on topography of village, suggestive location of disposal points with treatment facility is shown in the map and table below:

Table 3- 4: Sewage points proposed villages and its coverage villages

Sr No	Cluster Name	Village Name	Coverage Villages
1	Khamarpani	Chirrewani	Kundai
			Basanpur
			Sanwari
			Mohgaon Khurd
			Thuyepani
		Kanhargaon	Dainy
			Khamarpani
			Marjatpur
			Pulpuldoh
			Dudhgaon
		Saliwada	Antra
			Dongargaon
			Kadhiya
		Ghargaon	Silota Khurd
			Silota kala
			Bordi
			Sirrepani
			Pathra kala

Sr No	Cluster Name	Village Name	Coverage Villages
			Singardeep
		Bandhan raiyat	Bandhan mal
			Pathri
			Pathra khurd
		Kokiwara (Bichua)	
		Pathra	
		Kharanj (FV)	
2	Jamtara	Thotamal	Kanhasagar
			Dawajhir
			Thota rayat
			Naharjhir
		Dhoulpur	Banskheda
			Madariya
			Kokiwara (Chaurai)
		Sajpani	-
		Halal Khurd	Halal Kala
			Konapindrai
		Jamtra	
3	Karmajhiri	Tikari Rayat	Tikari mal
			Karmajhiri (FV)
		Barelipar	Paraspani
			Salahai
		Tevni	Bhodki
			Sarahari
			Ghatkohka
			Katangi
		Patrai	Dhutera
			Panjra
			Sindaria
			Mongaon titri
		Agri	Niwari
			Alesur
		Murer (FV)	
4	Dharam Kua-Rukhad	Darasi khurd	Darasi kala
			Khapa
		Mohgaon (FV)	Dharam Kua (FV)
		Rukhad	
		Nayegaon (FV)	
		Atarwani	
		Pandyer	
		Mirchiwada	
		Bawanthadi (FV)	
5	*Turia*	*Kodajhir*	*Setewani*
			Raiyarao
			Kurai
			Pindkapar

Sr No	Cluster Name	Village Name	Coverage Villages
			Mundiareeth
			Ambajhiri
			Jeerewara
			Durgapur
			Nayagaon
			Pachdhar
		Kmamba	*Ambari*
			Khamreeth
			Vijaypani
		Turia	*Kohka*
			Awarghani
			Satosha
			Kuppitola
		Arjuni	*Telia*
			Kothar (FV)

Source: Consultant Analysis

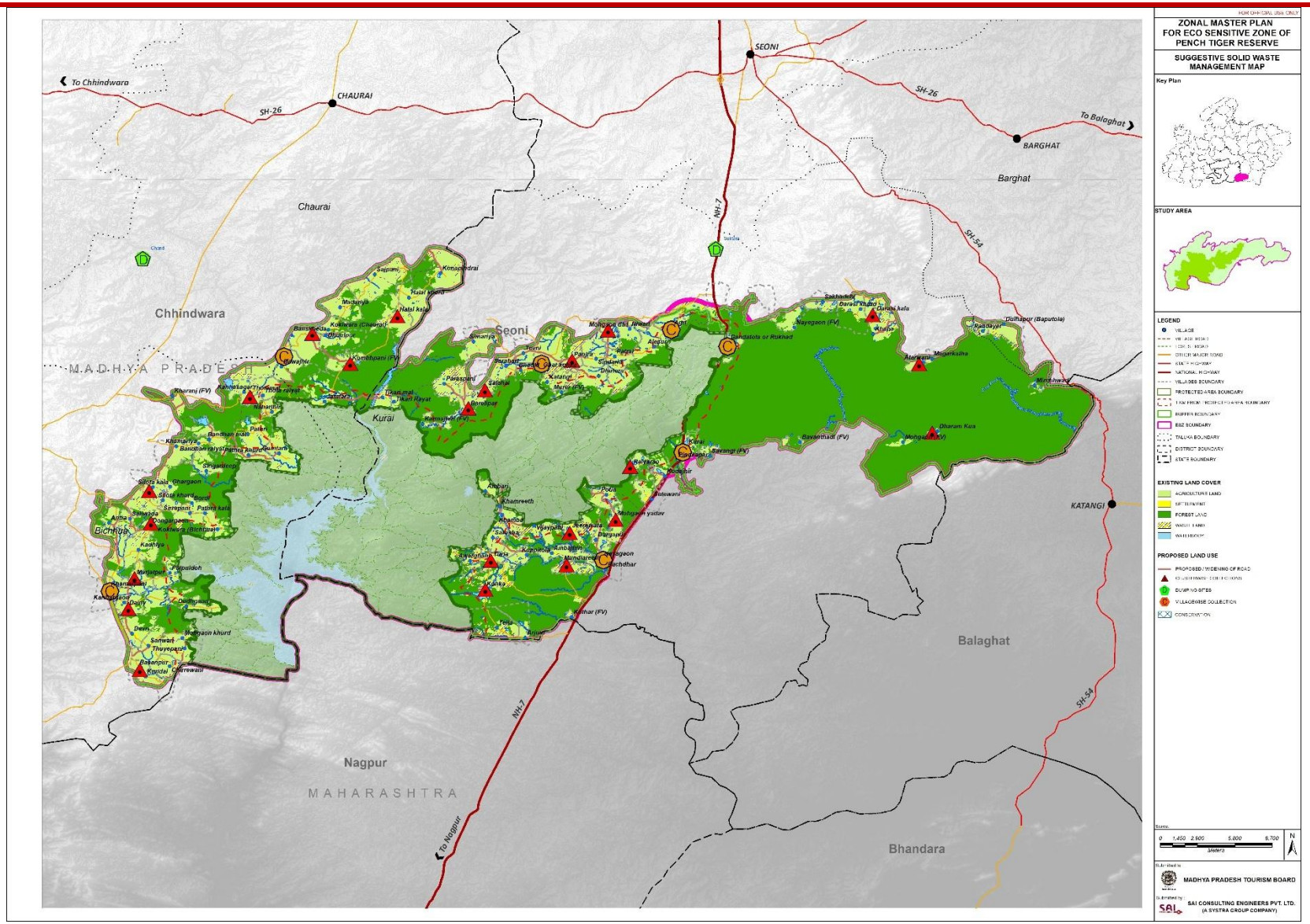
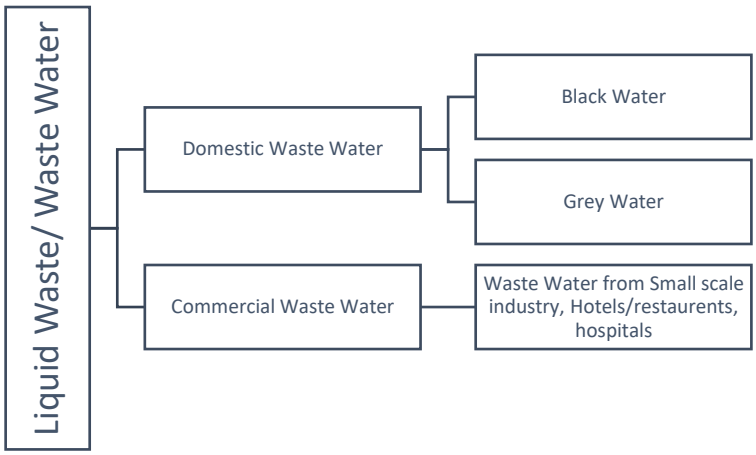


Figure 3. 7: Suggestive location of disposal points with treatment facility

However, the location for disposal of wastewater and wastewater treatment is to be finalised after preparation of DPR for wastewater disposal for individual villages or clusters and should be approved by PHE department of respective districts.

Used & unwanted wastewater generated in household or Commercial activities is called Liquid Waste.

Classification of wastewater and sources in villages of ESZ of PTR are as follows:



	• Black Water: Water from toilets/ contaminated with faecal matter	• Grey Water: All other wastewater (from kitchen, bathroom, cloth wash, vessel wash, animal wash etc.)

Figure 3. 8: Treatment of grey water in villages

There are menus of options available at the household, community and village level, all offering cost-effective treatment systems. While soak pits, leach pits and kitchen gardens are suggested at individual household levels, larger community pits and wetlands are suggested at the community level. At the village level, the Gram Panchayat can invest in bigger initiatives such as duck weed pond systems, Phytorid-based technologies and waste stabilization ponds. List of technology option under three implementation level for greywater management is shown below.

Table 3- 5: Deciding Parameters for Choosing Level of Greywater Technology Solutions

Sl. No	Parameters for selecting level of grey water management intervention	Household-level solutions	Community-level solutions	Village-level solutions
1	Quantity of Grey water generation	Low	Medium	High
2	Favourable soil condition	Yes	Yes	No
3	Ground water level condition	Low	Low	High
4	Availability of space at individual House Hold	Yes	No	No
5	Availability of community space	No	Yes	No
6	Existing drain Network	No	No	Yes

Suitability of level technology implementation may vary according to various scenario. Given the diversity in geographical conditions and habitational density across the country, suitability of greywater

management solutions also varies accordingly. The following matrix presents different technical and operational options suitable for these varied scenarios. These choices will inform the overall implementation framework in villages.

Table 3- 6: Suitability of Grey Water Management System based on Type of Settlement

Scenarios	Household-level solutions (Soak pits)	Community-level solutions	Village-level solutions	Bulk-generator solutions
Peri-urban, high settlement density, low availability of free land	L	M	H	H
Rural, high-settlement density, low availability of free land	M	H	H	M
Rural, low-settlement density, higher availability of free land	H	M	M	L
Tribal	H	M	L	L
Mountainous	H	M	L	M
High water table area	L	L	H	M
Region with Hard rock strata	L	L	H	H

L: Low suitability, M: Medium suitability, H: High suitability

Table 3- 7: Comparison of technologies based on Capax and Opex:

Technology	Capex	Opex	Management capacity
HH/community Level			
Kitchen Garden	●	●	●
Leach Pit/Magic Pit at HH level	●	●	●
Community Leach Pit	●	●	●
OFF Site			
Waste Stabilization pond	●	●	●●
DEWATS/Phytorid	●●	●●	●●

● Low ● Medium ● High ●● Very High

Black water treatment:

There are guidelines and standards regarding the treatment and reuse of blackwater. Central Public Health and Environmental Engineering Organization (CPHEEO) has specified discharge standards for treated black water. They permit the use of this water in agriculture and horticulture. Central Pollution Control Board (CPCB) has also issued standards for the disposal of treated black water. Central Ground Water Board (CGWB) advocates treated black water can be used as a source of artificial ground water recharge, once it meets standards and is compatible with existing ground water. Ministry of Environment, Forests and Climate Change has issued wastewater reuse policies with discharge and reuse standards.

Treated wastewater should reuse in agriculture activities, gardens or can be disposed to the nearby waterbody.

The Gram Panchayats (GPs) should prepare their Village Action Plan (VAP) for SBMG and JJM in a convergent manner. The Greywater management in villages should be planned in consonance with the piped water supply already provided to the villages/ planned to be provided under JJM or any other State's schemes. The VAP for SBMG and JJM should be part of their overall Gram Panchayat Development Plan (GPDP).

1.2.3.4 Solid Waste Management

As per CPCB newsletter, it is estimated that solid waste generated in small, medium and large cities and towns is about 0.1 kg, 0.3-0.4 kg and 0.5 kg per capita per day respectively[2]. For effective solid waste management, we have considered the maximum amount of solid waste generated per capita.

Currently only Turia has SWM system in entire PTR. As per discussion with Range Officer, Karmajhiri Range, the solid waste processing plant is non-operative at present.

As there are many tourist sites nearby villages in ESZ and accommodation facilities are proposed in nearby areas of villages, it is important to consider Solid waste generation by tourists in the area. Some research shows that solid waste generation by individual tourist is 1 kg/day (Zorpas, Voukkali, and Loizia (2015)). Considering carrying capacity of the area and proposed accommodation facility, solid waste generation of individual villages is calculated as per the below Table.

Table 3- 8: Village wise Solid Waste Generation:

Sr. No.	Village	2011	2021	2031	Solid Waste Generation
1	Atarwani	442	517	619	369
2	Bavanthadi (FV)	98	123	152	94
3	Darasi kala	686	793	908	518
4	Darasi khurd	1054	1147	1257	689
5	Dulhapur (Baputola)	1539	1789	2079	1442
6	Gandatola or Rukhad	372	426	489	279
7	Kharaj(FV)	177	192	208	113
8	Magarkatha	226	310	427	288
9	Mirchhwadi	47	41	33	13
10	Mohgaon (FV)	131	146	162	90
11	Nayegaon (FV)	580	689	842	510
12	Pandayer	403	452	497	271
13	Dharam Kua (FV)	93	104	117	66
14	Sakhadehi	605	629	619	299
15	Savangi (FV)	259	334	426	270
16	Ambajhiri	898	1015	1131	628
17	Ambari	400	473	552	321
18	Arjuni	281	320	364	206
19	Awarghani	392	474	571	342
20	Durgapur	259	434	769	744
21	Jeerewara	786	865	931	498
22	Khamreeth	133	165	210	131
23	Khapa	669	852	1065	669
24	Kodajhir	849	946	1054	586
25	Kohka	794	908	1023	574
26	Kothar (FV)	111	134	167	104

[2] http://www.cpcbenvis.nic.in/cpcb_newsletter/SOLID%20WASTE.pdf

Sr. No.	Village	2011	2021	2031	Solid Waste Generation
27	Kuppitola	363	403	433	672
28	Kurai	1927	2327	2746	1620
29	Mohgaon yadav	801	909	1057	614
30	Mundiareeth	368	414	457	251
31	Nayagaon	501	577	654	370
32	Pachdhar	678	771	848	465
33	Pindkapar	2090	2270	2378	1232
34	Potia	1029	1202	1380	789
35	Raiyarao	341	354	344	162
36	Satosha	561	673	802	475
37	Setewani	717	866	1083	670
38	Telia	805	872	921	483
39	Turia	1999	2361	2785	2074
40	Vijaypani	606	690	767	425
41	Agri	327	437	584	385
42	Alesur	486	510	529	273
43	Barelipar	408	476	543	396
44	Bhodki	163	181	202	112
45	Dhutera	646	723	799	440
46	Ghat Kohka	945	1075	1199	666
47	Karmajhiri (FV)	245	285	335	195
48	Katangi	356	379	390	198
49	Mohgaon titri	548	606	662	360
50	Murer (FV)	63	71	77	41
51	Niwari	135	143	143	70
52	Panjra	213	248	288	248
53	Paraspani	696	767	838	538
54	Patrai	826	893	967	522
55	Salahai	304	345	407	241
56	Sarahari	800	888	966	529
57	Simariya	783	958	1191	732
58	Sindaria	560	619	684	377
59	Tevni	470	497	523	275
60	Tikari mal	414	503	609	366
61	Tikari Rayat	215	218	219	113
62	Bandhan mal	724	852	984	566
63	Bandhan raiyat	235	280	338	203
64	Banskheda	1357	1565	1787	1075
65	Dawajhir	278	324	374	215
66	Dhoulpur	373	442	507	292
67	Gumtara	1765	2049	2351	1342
68	Halal kala	869	992	1136	648
69	Halal khurd	910	1099	1308	775
70	Jamtara	906	1015	1116	610

Sr. No.	Village	2011	2021	2031	Solid Waste Generation
71	Kanhasagar	307	428	593	423
72	Khamariya	1014	1261	1571	969
73	Kmamba	431	539	679	422
74	Kokiwara	260	294	326	180
75	Konapindrai	1171	1327	1468	808
76	Kumbhpani (FV)	316	326	318	151
77	Madariya	920	1058	1221	701
78	Naharjhir	288	332	371	207
79	Pathra khurd	151	173	187	102
80	Pathri	1076	1242	1415	803
81	Sajpani	1529	1856	2224	1327
82	Singardeep	493	646	836	540
83	Thota raiyat	70	72	83	49
84	Thotamal	1064	1245	1433	821
85	Antra	269	318	379	225
86	Basanpur	374	413	452	247
87	Bordi	279	335	394	231
88	Chirrewani	659	668	650	309
89	Dainy	629	670	702	365
90	Devri	1080	1183	1289	700
91	Dongargaon	286	351	423	255
92	Dudhgaon	1279	1478	1673	943
93	Ghargaon	409	503	627	386
94	Kadhiya	1208	1346	1495	828
95	Kanhargaon	683	726	760	396
96	Khamarpani	2325	3089	4046	2672
97	Kokiwara	506	581	646	358
98	Kundai	825	981	1155	677
99	Marjatpur	662	748	845	476
100	Mohgaon Khurd	238	318	422	278
101	Pathra kala	337	409	487	290
102	Pulpuldoh	1015	1187	1353	769
103	Saliwada	413	517	640	394
104	Sanwari	1114	1292	1496	862
105	Silota kala	521	592	674	382
106	Silota khurd	277	357	451	287
107	Sirrepani	613	763	960	596
108	Thuyepani	911	989	1043	545

Source: RADPFI Guidelines

**Highlighted texts indicate the villages in which accommodation facilities has been proposed and the tourist carrying capacity has been considered in calculations.*

From primary survey it has come to know that there is no provision of solid and liquid waste management in the most of the villages of ESZ of PTR. Villagers are dumping their domestic solid waste in empty land near by their households or outside the village. There is no dedicated dump site for solid waste collection

and management in the villages. Being an large settlement area along the highway, Kurai is having solid waste management collection system in the settlement. But there is no solid waste treatment facility in the ESZ area. Also, there is lack of liquid waste management in the villages of ESZ.

Being an Eco Sensitive Area, considering rich biodiversity of PTR, Solid and Liquid waste management should be provided in all the villages and towns of ESZ of PTR at household level, community level and village level for effective management the waste.

The above map indicates solid waste management network in ESZ of PTR. For effective implementation of Solid waste mangement, a conceptual model has been prepared.Solid waste is to be collected at 3 levels.

Village Level

- Household level collection
- Community level collection
- Collection of Waste of entire village at perticular location

Cluster Level

- Waste is to be collected at cluster collection point from each near by villages
- Waste collected from tourist sites will be dumped here
- Secondary Segrigation of waste
- Generate revenue from reusable waste (Plastic Waste) and compost of biodegradable waste
- Remaining waste will be sent to the nearest landfill site through container trucks

Landfill Site

- No landfill site has been proposed in ESZ

Solid Waste Management in villages of ESZ

Solid waste management should be initiated from household level. Household solid waste should be segregated in two different bins. One bin for wet waste and one for dry waste. Solid waste from households should be collected by door to door collection method.

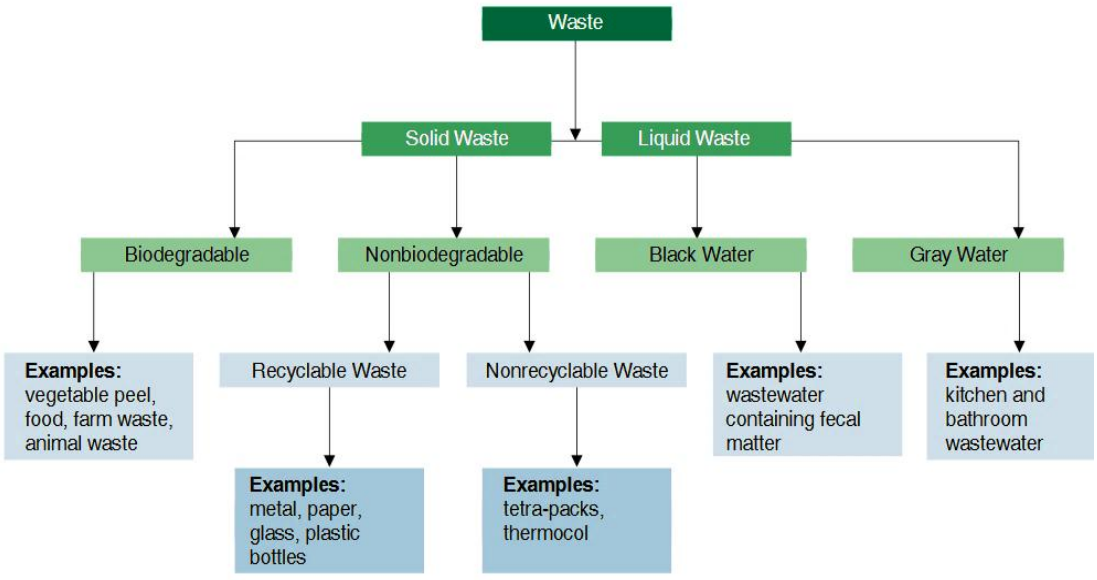


Figure 3. 9: Classification of Waste in Rural Area

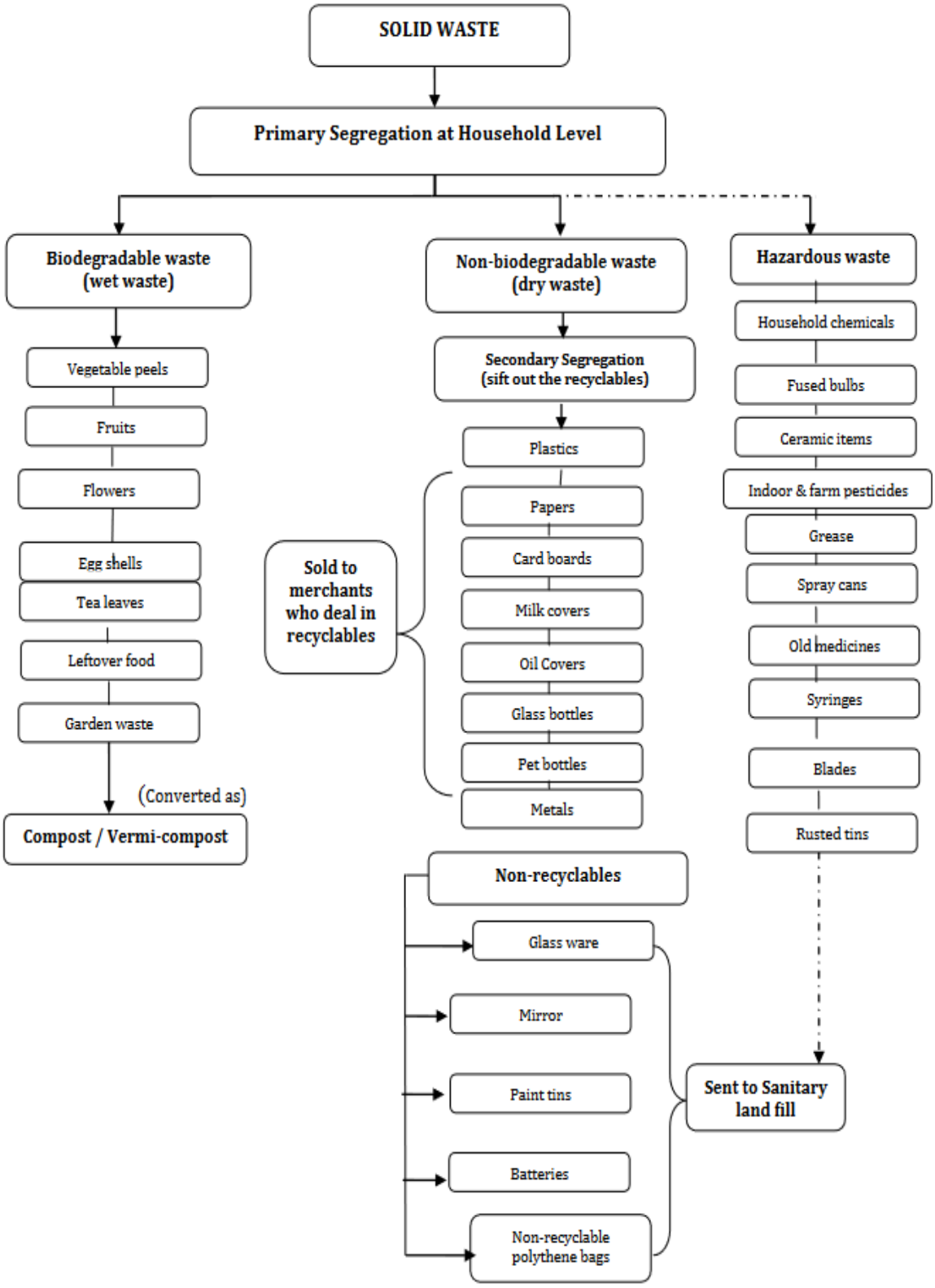


Figure 3. 10: Solid Waste Management in villages

Door to door collection system should be promoted in village for solid waste collection. For door to door collection, tricycle or van or e-rickshaw or any kind of vehicle should be provided from panchayat.

Figure 3. 11: Waste collection and segregation.

After segregating the recyclable& reusable waste, biodegradable waste should be compost with scientific methods of solid waste management & hazardous waste should be transferred to the landfill sites nearby. Composting is one of the most suitable methods in India for solid waste management in India. Some of the composting methods are described below with its advantages and disadvantages and condition of use.

Technology	Description
NADEP Method	Description: Composting takes place in a rectangular brick tank with aeration holes. Organic material is added in layers and compost is ready in almost 3 months
	Advantages: Composting can be done on a larger scale than using piles. All nutrients are retained in the tank so resulting compost is more nutrient rich.
	Disadvantages: Tanks work in 3-month rotations so at least 2 are needed which increases the cost. Large quantities of soil and water are needed which can be difficult to transport in some areas. The entire tank should be filled within a maximum 48-hour period (24hrs is better).
	Tanks can be built in all conditions. The thatch roof protects the tank from moisture. Tank should be monitored to check for cracking of seal which would allow moisture to escape. Tanks require space and a lot of initial material, so a community approach is better, using a communal space for the tank and agreeing the date for bringing material/ filling the tank
Vermicomposting	Composting using a specific species of worms to break down waste Compost is ready in 3-4 months but 7compost must be removed in stages as the worms process it
	Advantages: More efficient than normal composting and produces richer compost.
	Disadvantages: Needs a vermitank or verminbed and worms need to be bought or grown which increases cost Needs more O+M than normal composting to keep the worms alive
	Condition of Use: Worms' optimal temperature range is 15-35 degrees Celsius. Lower temperatures hamper reproduction and higher temperatures kill the worms or make them leave. Worms are very sensitive to drought so use in very dry areas is not recommended unless a reliable water source is available
Biogas from organic solid waste	Biogas is created by the decomposition of organic waste in anaerobic conditions. The resulting gas can be let off into the atmosphere or it can be tapped for burning as a fuel. As well as the biogas, the process also produces a slurry which can be used as a nutrient rich fertilizer.
	Advantages: It can be used as cooking fual for individual households as well as community level
	Disadvantages: Gas accumulation rates are slower than rates of use but for areas reliant on wood as a fuel for cooking biogas provides an excellent alternative.
	Condition of Use: The biogas plant can be linked to the family or community toilet or it can be a standalone system to which wastes are added. There are many different designs available. The choice of design will be influenced primarily by the desired capacity, the space available to install the plant, the type of feed material (cattle dung has higher gas producing capacities than human waste) and the finances available for construction. Waste should be added daily to ensure

Technology	Description
	continuous gas production. Stoves, cookers or lamps must be converted to accept biogas but the gas itself burns without odour.

Source: Ministry of Drinking Water and Sanitation and Asian Development Bank (2014) Guidelines on Solid and Liquid Waste Management (SLWM) in Rural Areas. Government of India

Implementation Strategy:

For effective implementation of solid waste management, state level to village level actors have been identified under SBMG (Swachh Bharat Mission Gramin), which enables technical, financial and administrative support from state level to district level to block level.

Level	*Organization*
State	Public Health Engineering Department
	Water Supply and Sanitation Department
	Communication and Capacity Development Unit
	Panchayati Raj and Rural Development Department
	Tribal Development Department
	State Pollution Control Board
District	Zila Panchayat
	SBM (G) Cell
	NGOs
	Private sector
Block	Block Development Officer
	Panchayat Raj Public Works
	Block Resource Centre
	NGOs
	Private sector
GP	Gram Sevak/Sachiv
	Panchayat Development Office
	Community Based Organisations
	SHGs
	Private sector/entrepreneurs

Level	*Organization*
	Households

Non-biodegradable and hazardous waste are to be collected in a separate bin for entire village and should be transported by a container or truck at nearest landfill site. A separate Solid waste management plan should be prepared for Eco Sensitive Zone and should be approved by Pollution Control Board of the state and CEO, Rural Development of respective district. As ESZ is rich in biodiversity, no landfill sites have been proposed in ESZ. Block level or district level authority will manage the collection and treatment of hazardous and non-biodegradable waste from every village of ESZ.

1.2.3.5 Management of Water Supply, Drainage and Storm Water

In order to provide basic physical infrastructure facilities, clusters are formed based on topography and distance of villages. Infrastructure facilities in villages with more than 3 km distance from other settlement should be developed for individual villages. List of clusters and villages for physical infrastructure are as shown in the table below:

Table 3- 9: cluster wise water supply scheme

Sr No	Cluster Name	Village Name	Coverage Villages
1	Khamarpani	Sanwari	Kundai
			Basanpur
			Devri
			Mongaon Khurd
			Thuyepani
			Chirrewani
		Marjatpur	Dainy
			Kahhargaon
			Khamarpani
			Kadhiya
			Pulpuldoh
		Saliwada	Antra
		Sirrepani	Bordi
			Pathra kala
			Silota khurd
			Silota kala
			Ghargaon
		Pathra khurd	
2	Jamtara	Bandhan mal	Khamariya
			Bandhan raiyat
			Singardeep
		Thota riyat	Pathri
			Thotamal
			Kanhasagar
			Thota riyat
			Naharjhir
		Dawajhir	Dhoulpur
			Kokiwara (Chaurai)
		Madariya	Banskheda

Sr No	Cluster Name	Village Name	Coverage Villages
			Sajpani
			Halal kala
		Konapindrai	-
		Jamtra	
		Kharanj (FV)	
3	Karmajhiri	Tikari Rayat	Tikari mal
			Karmajhiri (FV)
		Salahai	Barelipar
			Paraspani
			Simariya
			Sarahari
			Bhodki
		Panjra	Murer (FV)
			Katangi
			Ghatkohka
			Sindaria
			Dhutera
		Alesur	Patrai
			Niwari
			Agri
4	Dharam Kua-Rukhad	Darasi kala	Khapa
			Darasi khurd
		Pandayer	Dulhapur (Baputola)
		Dharam Kua (FV)	Mohgaon (FV)
		Rukhad	
5	Turia	Raiyarao	Kodajhir
		Satosha	Turia
			Awarghani
			Kmamba
			Khamreeth
			Vijaypani
			Kuppitola
		Mundiareeth	Ambajiri
			Jeerewara
			Durgapur
			Nayagaon
			Pachdhar
		Arjuni	Telia
		Kurai	
		Potia	
		Mohgaon Yadav	
		Kohka	
		Ambari	

In here, Kurai and Khamarpani are the only urban settlement areas in ESZ of PTR. So, infrastructure facilities should be provided in this towns as per standards.

Also, promotion of tourism in eco sensitive zone is one of the focus of Sub Zonal Tourism master plan, so based on carrying capacity of the area, infrastructure requirements for tourists are also provided in this chapter.

1.2.3.5.1 Water Supply

As per National Rural Drinking Water Programme and RADPFI (Rural Area Development Plan Formulation and Implementation) Guidelines minimum water requirement for rural area is 55 LPCD. Along with that as per manual for preparation of detailed project report for rural piped water supply scheme, Ministry of Water and Sanitation, GOI- February 2013, 30 Litre per animal per day water has been considered for livestock in rural areas. And as per URDPFI (Urban and Regional Development Plan Formulation and Implementation) Guidelines, 2014, water requirement for urban area is 135 LPCD. Also, as per Central Ground Water Authority, daily water requirement for floating population/ visitors is to be consider 15 lpcd. And as per IS Code 1172- 1993, Water requirement for hotels and resorts is considered as 180 lpcd.

All these norms for water supply can be summarized as shown in table below:

Table 3- 10: Norms for water supply

Sr. No.	Category	Water Supply Standard	Authority/ Guidelines
1	Rural Area	55 lpcd	NRDWP
2	Livestock	30 lpcd	Ministry of Water and Sanitation
3	Urban Area	135 lpcd	URDPFI
4	Floating Population/ Visitor	15 lpcd	CGWA
5	Hotels/ Resorts	180 lpcd	IS Code 1172- 1993

Source: *RADPFI Guidelines and URDPFI Guidelines*

The calculation and detailed description for water supply with carrying capacity is in the Annexure 11.1 Water Supply demand has been calculated for clusters and individual villages considering carrying capacity of tourists in the table below:

Table 3- 11: Total Water supply requirements in notified villages

Sr. No.	Village	2011	2021	2031	2041	Water Supply Requirement
1	Atarwani	442	517	619	737	62676
2	Bavanthadi (FV)	98	123	152	188	15995
3	Darasi kala	686	793	908	1035	87995
4	Darasi khurd	1054	1147	1257	1378	117095
5	Dulhapur (Baputola)	1539	1789	2079	2404	247544
6	Gandatola or Rukhad	372	426	489	559	47502
7	Kharaj(FV)	177	192	208	225	19131
8	Magarkatha	226	310	427	576	48919
9	Mirchhwadi	47	41	33	26	2186
10	Mohgaon (FV)	131	146	162	179	15229
11	Nayegaon (FV)	580	689	842	1020	86699
12	Pandayer	403	452	497	543	46125
13	Dharam Kua (FV)	93	104	117	131	11141
14	Sakhadehi	605	629	619	597	50747
15	Savangi (FV)	259	334	426	540	45941

Sr. No.	Village	2011	2021	2031	2041	Water Supply Requirement
16	Ambajhiri	898	1015	1131	1256	106781
17	Ambari	400	473	552	642	54563
18	Arjuni	281	320	364	412	35033
19	Awarghani	392	474	571	684	58143
20	Durgapur	259	434	769	1489	126556
21	Jeerewara	786	865	931	996	84689
22	Khamreeth	133	165	210	262	22260
23	Khapa	669	852	1065	1338	113737
24	Kodajhir	849	946	1054	1172	99588
25	Kohka	794	908	1023	1148	97541
26	Kothar (FV)	111	134	167	207	17603
27	Kuppitola	363	403	433	462	118642
28	Kurai	1927	2327	2746	3241	275474
29	Mohgaon yadav	801	909	1057	1227	104312
30	Mundiareeth	368	414	457	502	42689
31	Nayagaon	501	577	654	739	62855
32	Pachdhar	678	771	848	929	78991
33	Pindkapar	2090	2270	2378	2464	209466
34	Potia	1029	1202	1380	1578	134148
35	Raiyarao	341	354	344	325	27624
36	Satosha	561	673	802	949	80674
37	Setewani	717	866	1083	1339	113830
38	Telia	805	872	921	965	82029
39	Turia	1999	2361	2785	3266	356987
40	Vijaypani	606	690	767	850	72228
41	Agri	327	437	584	769	65384
42	Alesur	486	510	529	546	46419
43	Barelipar	408	476	543	627	68085
44	Bhodki	163	181	202	224	19079
45	Dhutera	646	723	799	879	74740
46	Ghat Kohka	945	1075	1199	1331	113142
47	Karmajhiri (FV)	245	285	335	391	33220
48	Katangi	356	379	390	397	33729
49	Mohgaon titri	548	606	662	720	61202
50	Murer (FV)	63	71	77	82	7011
51	Niwari	135	143	143	140	11909
52	Panjra	213	248	288	332	42991
53	Paraspani	696	767	838	912	92299
54	Patrai	826	893	967	1045	88796
55	Salahai	304	345	407	482	40942
56	Sarahari	800	888	966	1059	89975
57	Simariya	783	958	1191	1464	124412
58	Sindaria	560	619	684	753	64023
59	Tevni	470	497	523	550	46739

Sr. No.	Village	2011	2021	2031	2041	Water Supply Requirement
60	Tikari mal	414	503	609	732	62240
61	Tikari Rayat	215	218	219	226	19239
62	Bandhan mal	724	852	984	1133	96265
63	Bandhan raiyat	235	280	338	406	34544
64	Banskheda	1357	1565	1787	2031	183411
65	Dawajhir	278	324	374	430	36581
66	Dhoulpur	373	442	507	584	49605
67	Gumtara	1765	2049	2351	2684	228170
68	Halal kala	869	992	1136	1297	110217
69	Halal khurd	910	1099	1308	1551	131832
70	Jamtara	906	1015	1116	1220	103682
71	Kanhasagar	307	428	593	846	71951
72	Khamariya	1014	1261	1571	1938	164695
73	Kmamba	431	539	679	844	71747
74	Kokiwara	260	294	326	359	30551
75	Konapindrai	1171	1327	1468	1617	137429
76	Kumbhpani (FV)	316	326	318	303	25735
77	Madariya	920	1058	1221	1402	119203
78	Naharjhir	288	332	371	414	35189
79	Pathra khurd	151	173	187	204	17324
80	Pathri	1076	1242	1415	1606	136508
81	Sajpani	1529	1856	2224	2655	225644
82	Singardeep	493	646	836	1080	91782
83	Thota raiyat	70	72	83	97	8277
84	Thotamal	1064	1245	1433	1643	139639
85	Antra	269	318	379	450	38287
86	Basanpur	374	413	452	494	41959
87	Bordi	279	335	394	462	39291
88	Chirrewani	659	668	650	618	52561
89	Dainy	629	670	702	731	62132
90	Devri	1080	1183	1289	1400	119010
91	Dongargaon	286	351	423	509	43287
92	Dudhgaon	1279	1478	1673	1886	160350
93	Ghargaon	409	503	627	773	65681
94	Kadhiya	1208	1346	1495	1656	140736
95	Kanhargaon	683	726	760	791	67277
96	Khamarpani	2325	3089	4046	5345	454319
97	Kokiwara	506	581	646	716	60872
98	Kundai	825	981	1155	1353	115016
99	Marjatpur	662	748	845	951	80863
100	Mohgaon Khurd	238	318	422	556	47260
101	Pathra kala	337	409	487	579	49227
102	Pulpuldoh	1015	1187	1353	1538	130750
103	Saliwada	413	517	640	789	67030

Sr. No.	Village	2011	2021	2031	2041	Water Supply Requirement
104	Sanwari	1114	1292	1496	1725	146589
105	Silota kala	521	592	674	765	65000
106	Silota khurd	277	357	451	573	48737
107	Sirrepani	613	763	960	1192	101353
108	Thuyepani	911	989	1043	1090	92689

Source :URDPFI Guidelines

**Highlighted texts indicate the villages in which accommodation facilities has been proposed and the tourist carrying capacity has been considered in calculations.*

Tap water connection should be provided at household level for water supply in the villages of ESZ. Where tap water connection is not possible, community stand post or hand pumps should be provided within 100 m from settlement area[3].

There are various models available for water supply in villages. Some of them are mentioned below:

- Cluster based water supply scheme
- Water supply scheme for individual village
- In tribal/ hilly/ forested areas, option of gravity and/or solar power-based water supply schemes with low O&M expenditure
- In hills and mountains, springs as a reliable source for drinking water

Any of the model can be adopted for water supply in villages based on suitability and feasibility study of water source. Detailed project report will be prepared for adopted model of water supply scheme for villages of ESZ of STR.

As per Census and primary survey, the only villages of ESZ having tap water connection are:
Nayegaon, Kurai, Kumbhpani, Pathra Khurd, Konapindrai, Halal Kala, Halal Khurd, Madariya and Kokiwara.
Remaining villages are to be covered with household tap water connections.
The map below represents the villages proposed for water supply scheme (Cluster based or individual).

[3] NRDWP Guidelines, 2013

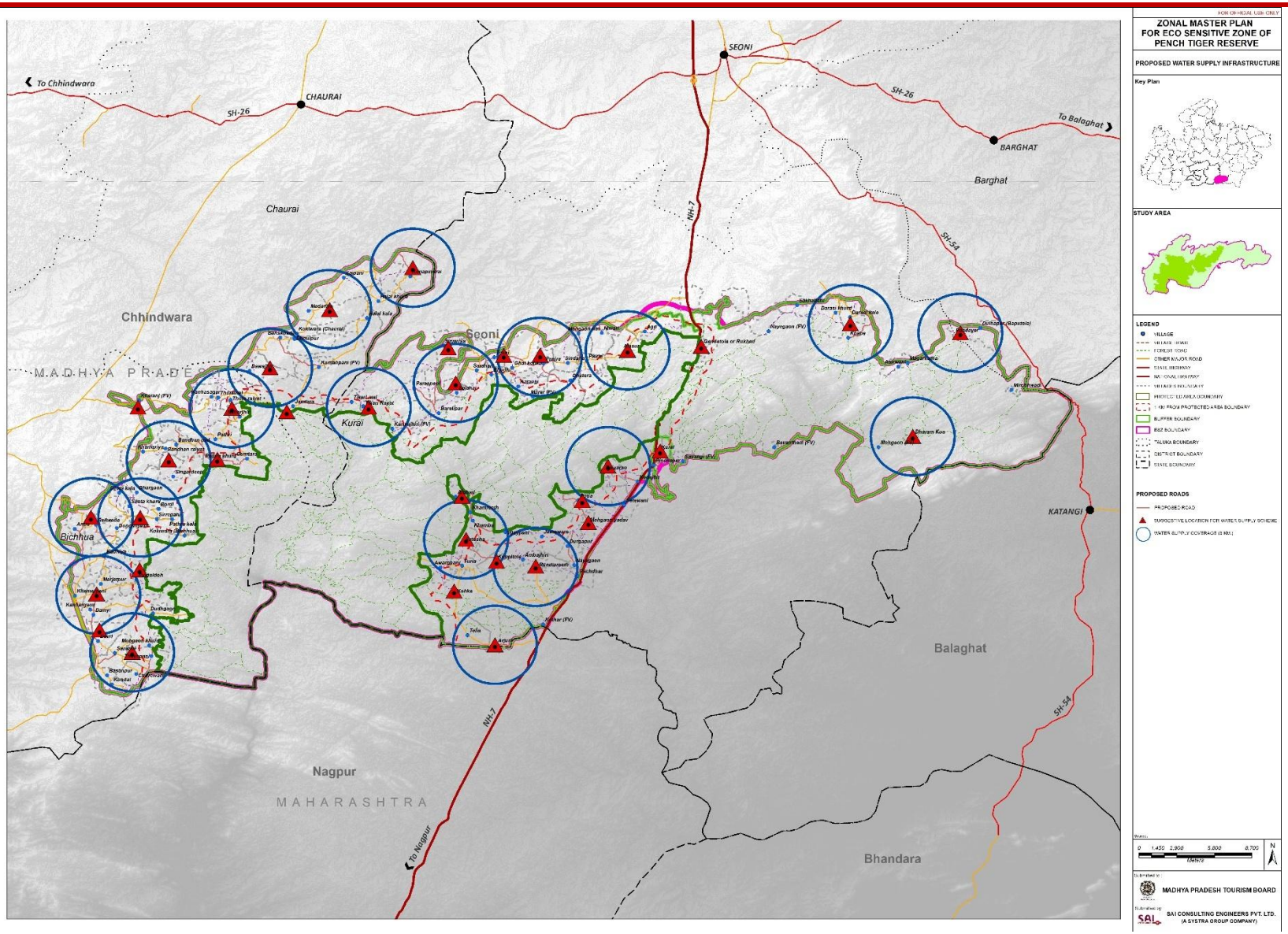


Figure 3. 12 Proposed Clusters for Water supply network

1.2.3.6 Sanitation of Villages in ESZ

Swachh Bharat Mission, in all the villages of ESZ of PTR, most of the household have individual toilets constructed in recent years. Construction of household toilets and community toilets in the villages will lead to achieving the Sustainable Development Goal- 6 (SDG- 6) Clean Water and Sanitation. Hon. Prime Minister Shree Narendra Modi had already announced Rural India as Open Defecation Free on 2nd October 2019. Individual or community Soak pits should be provided for individual toilets or for a group of household toilets in each village make hygienic atmosphere in the area. For left out/ remaining households under SBM will get upto INR 12000 incentive to construct household toilet. That includes provision of water storage facility for handwashing and cleaning to maintain hygiene.

Under Swachh Bharat Mission (Gramin) (SBMG) Phase-2 guidelines, the concept of ODF plus village has been introduced. The guideline suggests ODF-plus villages must endeavour to have at least one CSC which may cater to the sanitation needs of floating population. The GP will decide upon a suitable location for construction of CSC that is easily accessible to all, having adequate water availability and where long-term O&M is ensured. For construction of CSC, financial assistance will be provided under the scheme up to Rs. 3 Lakh. In which, 30% of the amount will be borne by GPs from 15th Finance Commission

1.2.3.7 Social Infrastructure for Villages

Social Infrastructure is one of the critical aspects when it comes to development of rural area. Social infrastructure includes education facilities, public health facilities, Banking facility, recreational facilities etc.

RADPFI set up a guideline for need of social infrastructure in rural area as show in table below:

Table 3- 12: Norms for Provision of Social Infrastructure in Villages as per RADPFI

Use	Standard/Population	Area (in hectares)	Distance from Habitation
a) Primary School	1 for 5000	0.4 to .6 ha	Within 500 meters
b) High School with Primary School	1 for 15000	1 ha	Within 1 km
c) Dispensary/Health Centre	1 for 5000	.05 ha	Within 500 meters
d) Aanganwadi	1 for 5000	.05 ha	Within 500 meters

Source: RADPFI Guidelnes

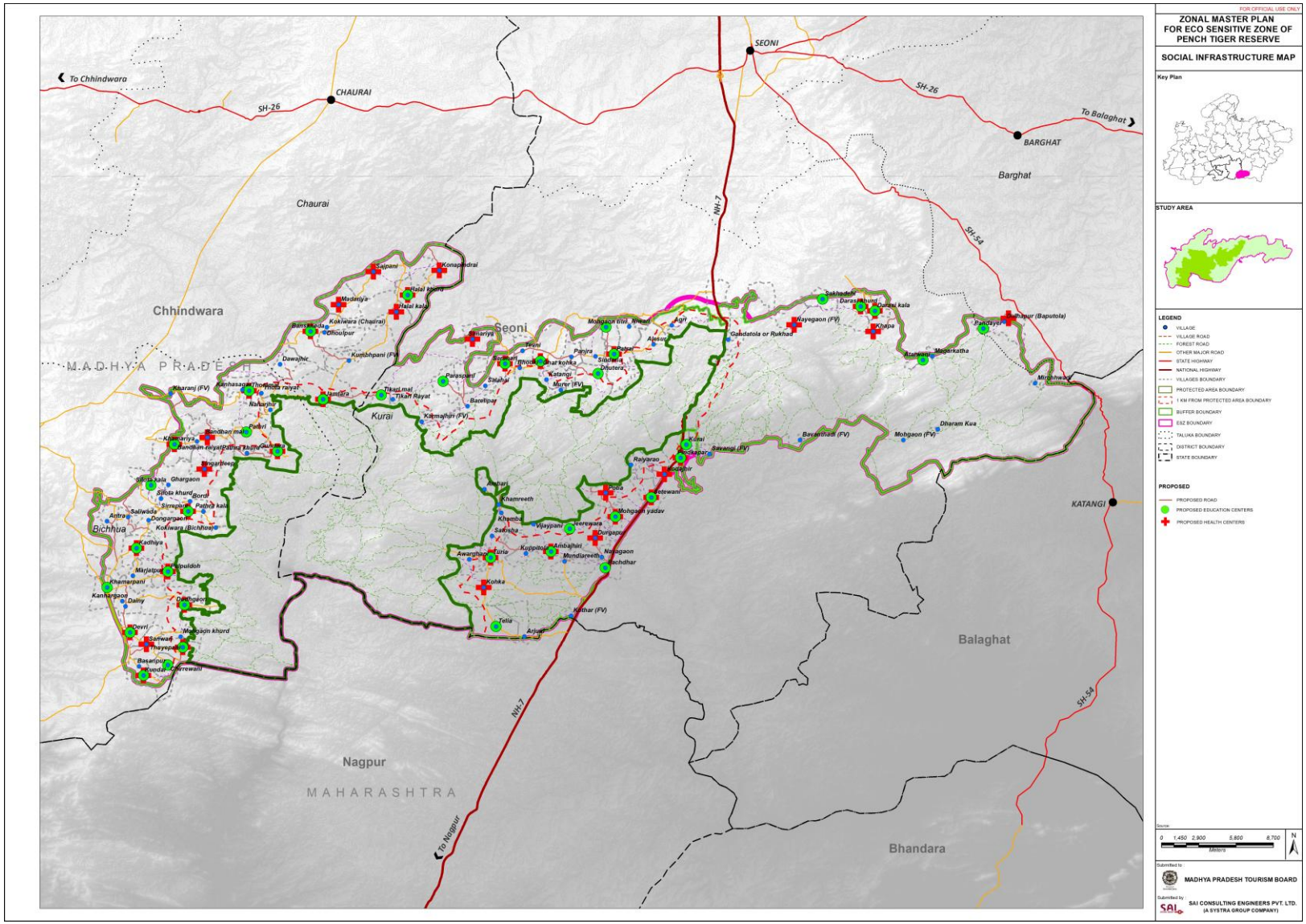


Figure 3. 13: Social Infrastructure Map

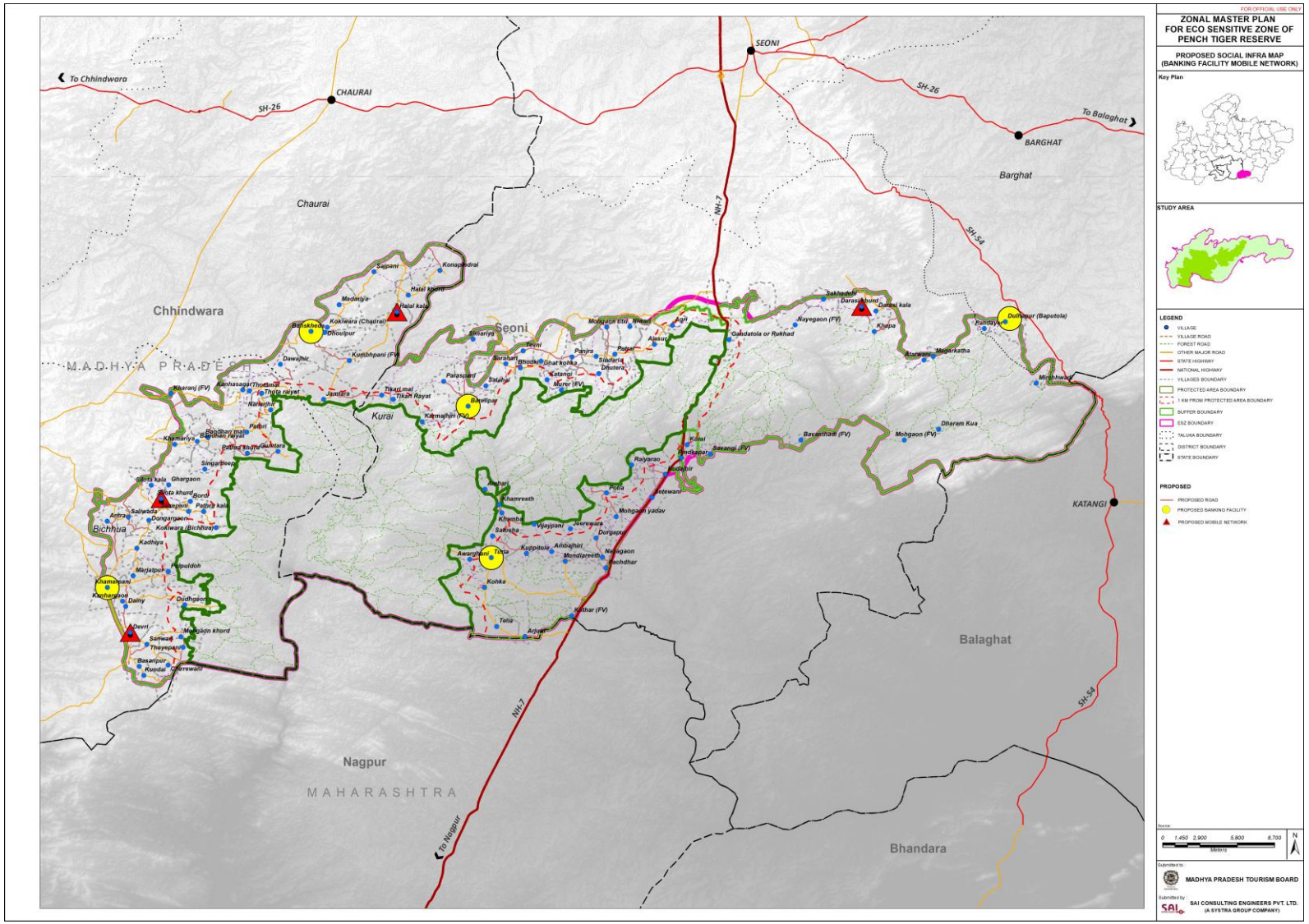


Figure 3. 14: Proposed Mobile Network Coverage and Banking Facility

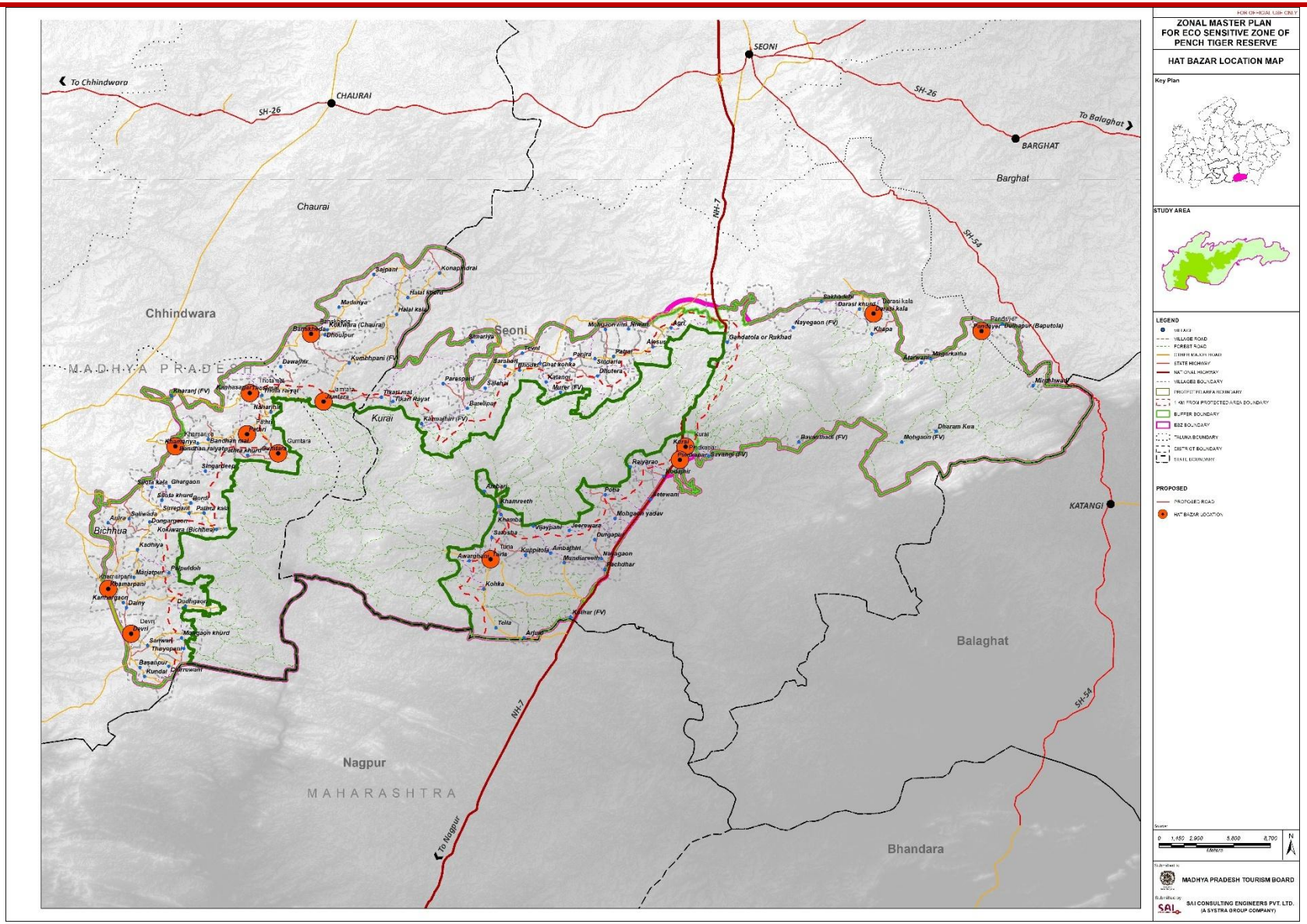


Figure 3. 15: Location of Haat Bazar

1.2.3.8 Vehicular Traffic Control

1.2.3.8.1 Proposal for Road widening and improvement of roads

A cluster wise approach for the assessment and proposal is adapted for the region of Eco-Sensitive Zone. The Eco-Sensitive Zone divided into 5 clusters based on its natural features, roads, administrative boundaries and Eco-Sensitive Zone boundaries. The 5 clusters are namely, Turia cluster, Karmajhiri cluster, Jamtra - Kumbhpani cluster, Khamarpani cluster and Dharam Kua cluster. It should be applicable only to areas outside any forest as wildlife movement along forest patches and streams will be disturbed due to fast and heavy traffic and will lead to man animal conflict situations.

1. Turia Cluster

The cluster has the major focus on tourism and having the good connectivity via roads. The proposed routes with existing routes are as per below map.

The length of existing and proposed are as per below table.

Table 3- 13: Proposed widening and new proposed road in Turia Cluster

Villages	Proposal for Connectivity			Total Length	Proposed Connectivity	
	Existing Pucca Road (m)	Existing Kacha Road (m)	Existing WBM Road (m)		Surface Improvement Length (m)	Proposed Roads Length (m)
Telia to Arjuni			2352.00	2352.00		
Arjuni to Kothar			4842.00	4842.00		
NH to Turia	9053.68			9053.68		
Turia to Awarghani	936.26			936.26		
Awarghani to Turia Gate	1926.61			1926.61		
Turia to Kohka	2457.81			2457.81		
Turia to Satosha	1884.20	387.50		2271.70	387.50	
Satosha to ambajhiri		1832.09		1832.09	1832.09	
Satosha to Kmamba		433.28	2320.71	2753.99	433.28	
Kmamba to Khamreeth			832.70	832.70	832.70	
Khamreeth to Ambari		2189.70		2189.70	2189.70	
Mundiareeth to Pachdhar	3392.93	1032.20		4425.13	1032.20	
NH to Nayegaon		865.59		865.59		865.59
Nayegaon to Durgapur		1591.97		1591.97		1591.97
NH to Mohgaon Yadav	1228.38			1228.38		
Mohgaon Yadav to Jeerewada	3840.97			3840.97		
Jeerewada to Vijaypani	2859.91			2859.91		
Mohgaon Yadav to Potia			2604.66	2604.66	2604.66	
Potia to NH	3194.36			3194.36		
Setwewani - Raiyarao-Kodajhir		5757.62		5757.62		
Kodajhir to Kurai	3150.00			3150.00		
Total Length (m)	**33925.1**	**14089.9**	**12952.0**	**60967.1**	**9312.1**	**2457.5**

2. Karmajhiri Cluster

The cluster has the major focus on tourism and having the good connectivity via roads. The length of the existing and proposed roads as per below maps.

The length of existing and proposed are as per below table.

Table 3- 14: Proposed widening and new proposed road in Karmajhiri Cluster

Villages	Proposal for Connectivity			Total Length (m)	Proposed Connectivity	
	Existing Pucca Road (m)	Existing Kacha Road (m)	Existing WBM Road (m)		Surface Improvement Length (m)	Proposed Roads Length (m)
NH to Agri	3010.65			3010.65		
Agri to Alesur	2191.30			2191.30		
Alesur to Patrai	3157.30			3157.30		
Patrai to Mohgaon Titri		2812.77		2812.77	2373.82	
Patrai to Sindaria	1401.35			1401.35		
Patrai to Dhutera	2455.40			2455.40		
Sindaria to Panjara		1827.78		1827.78	1068.55	
Panjara to Ghatkohka Road		1816.29		1816.29	1816.29	
Ghatkohka to Bhodki	1651.49			1651.49		
Ghatkohka to Tevni to Sarahiri		4938.70		4938.70	3491.00	
Bhodki to Sarrahiri	1157.90			1157.90		
Bhodki to Salhai	3157.64			3157.64		
Salhai to Barelipar	2465.90	187.70		2653.60	187.70	
Barelipar to Paraspani		4175.03		4175.03	2169.69	
Barelipar to Karmajhiri	3752.05			3752.05		
Karmajhiri to Rikari Raiyat	3320.66			3320.66		
Tikari Raiyat to Tikari Mal	751.48			751.48		
Total Length (m)	**28473.11**	**15758.27**	**0.00**	**44231.38**	**11107.05**	**0.00**

3. Jamtra-Kumbhpani Cluster

The cluster has the major focus on tourism and agriculture. It has good connectivity available among the notified villages via roads. The length of the existing and proposed roads as per below maps.

The length of existing and proposed are as per below table.

Table 3- 15: Proposed widening and new proposed road in Jamtara-Kumbhpani Cluster

Villages	Proposal for Connectivity			Total Length	Proposed Connectivity	
	Existing Pucca Road (m)	Existing Kacha Road (m)	Existing WBM Road (m)		Surface Improvement Length (m)	Proposed Roads Length (m)
Tikari Mal to Jamtara		4666.00		4666.00	4666.60	
Jamtara to Kumbhpani	3422.44	554.47		3976.91	554.47	
Kumbhpani to Halal Kala	6014.79			6014.79		
Halal Kala to Halal Khurd	2870.19			2870.19		
Halal Khurd to Sajpani	3241.51			3241.51		
Halal Khurd to Konapindarai	3561.53			3561.53		
Sajpani to Madaria	3678.88			3678.88		
Madaria to Kokiwara	2802.65			2802.65		

Villages	Proposal for Connectivity			Total Length	Proposed Connectivity	
	Existing Pucca Road (m)	Existing Kacha Road (m)	Existing WBM Road (m)		Surface Improvement Length (m)	Proposed Roads Length (m)
Kokiwara to Dhaulpur	488.37			488.37		
Dhaulpur to Banskheda	1110.89			1110.89		
Banskheda to Dawajhir	4766.10	151.40		4917.50	151.40	
Dawajhir to Thotal Mal		2657.10		2657.10		2507.60
Thota Mal to Thota Raiyat	1120.41			1120.41		
Thota Mal to Kharanj	3685.00			3685.00		
Thota Raiyat to Kanhasagar	267.41			267.41		
Thota Raiyat to Naharjhir	1767.60			1767.60		
Naharjhir to Pathari	2960.20			2960.20		
Pathri to Gumtara	3563.10			3563.10		
Pathri to Bandhan Mal	3825.40			3825.40		
Bandhan Mal to Bandhan Raiyat	1209.90			1209.90		
Bandhan Raiyat to Khamariya	682.90			682.90		
Khamariya to Singardeep	952.80			952.80		
Total Length (m)	**51992.06**	**8028.97**	**0.00**	**60021.03**	**5372.47**	**2507.60**

4. Khamarpani cluster

The cluster has the major focus on tourism and having the good connectivity via roads. The length of the existing and proposed roads as per below maps.

The length of existing and proposed are as per below table.

Table 3- 16: Proposed widening and new proposed road in Jamtara-Kumbhpani Cluster

Villages	Proposal for Connectivity			Total Length	Proposed Connectivity	
	Existing Pucca Road (m)	Existing Kacha Road (m)	Existing WBM Road (m)		Surface Improvement Length (m)	Proposed Roads Length (m)
Khamariya to Silota Kala		3389.53		3389.53	2263.43	
Silota Kala to Ghargaon	2137.70			2137.70		
Ghargaon to Silota Khurd		1547.77		1547.77	709.27	
Silota Kala to Dongergaon	3525.50			3525.50		
Dongergaon to Kadaiya	2558.20			2558.20		
Kadaiya to Marjatpur	2203.72			2203.72		
Marjatpur to Pulpuldoah	3592.70			3592.70		
Marjatpur to Khamarpani	2111.70			2111.70		
Khamarpani to Kanhargaon	1299.50			1299.50		
Kanhargaon to Dudhgaon	4311.71			4311.71		
Kanhargaon to Devri		2912.58		2912.58	2646.20	
Devri to Sanwari	1555.50			1555.50		

Villages	Proposal for Connectivity			Total Length	Proposed Connectivity	
	Existing Pucca Road (m)	Existing Kacha Road (m)	Existing WBM Road (m)		Surface Improvement Length (m)	Proposed Roads Length (m)
Sanwari to Thuyepani	1460.71			1460.71		
Thuyepani to Mohgaon Khurd		936.58		936.58	506.15	
Sanwari to Chhirewani	2236.60			2236.60		
Devri to Basanpur	1060.84			1060.84		
Basanpur to Kundai	796.87			796.87		
Total Length (m)	**28851.26**	**8786.46**	**0.00**	**37637.72**	**6125.05**	**0.00**

5. Dharam Kua cluster

The cluster has the major focus on tourism and having the good connectivity via roads. The length of the existing and proposed roads as per below maps.

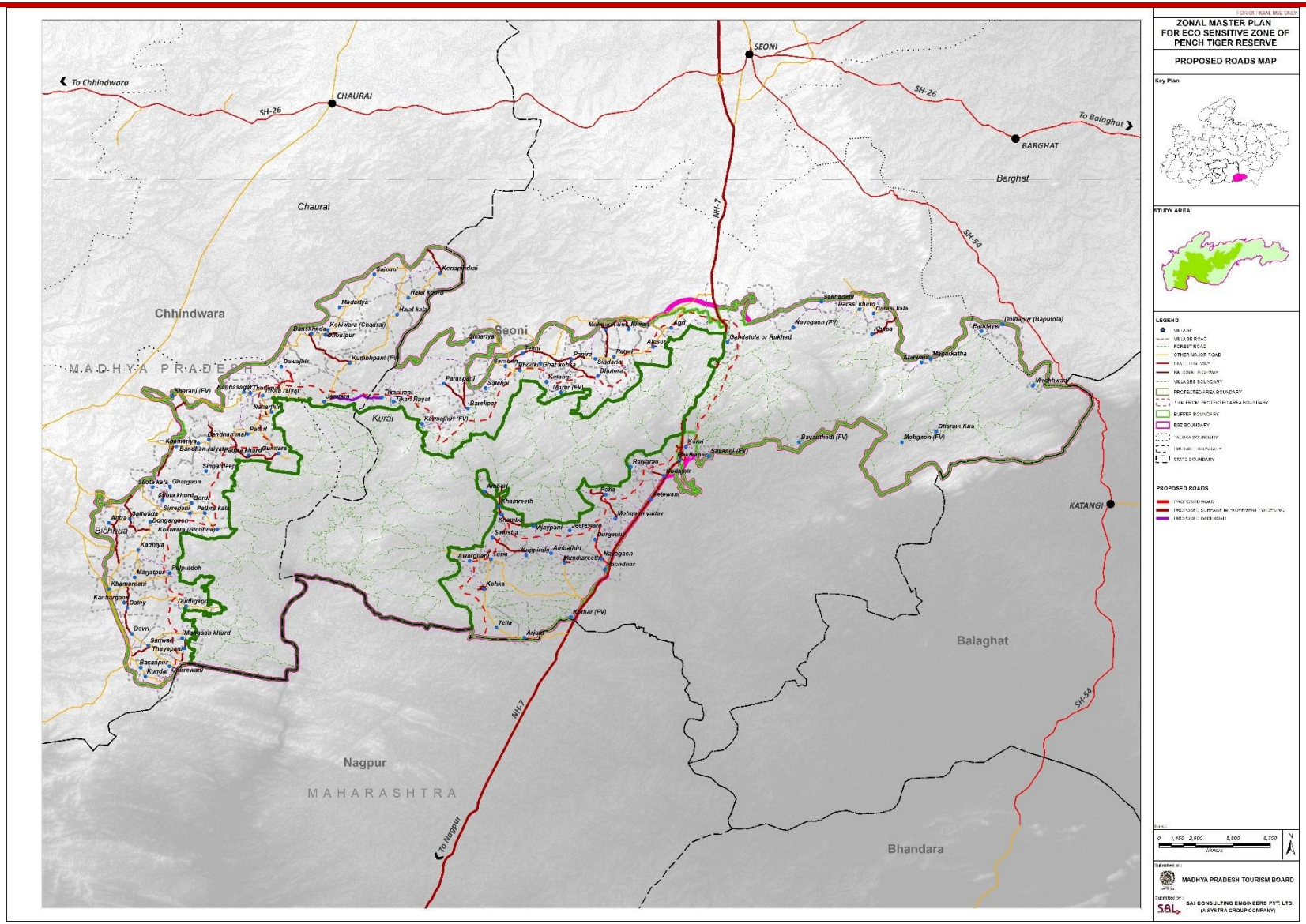


Figure 3. 16: Proposed Road Map

The length of existing and proposed are as per below table.

Table 3- 17: Proposed widening and new proposed road in Dharam Kua Cluster

Villages	Proposal for Connectivity				Total Length
	Existing Pucca Road (m)	Existing Kacha Road (m)	Existing WBM Road (m)	Forest Roads	
SH to Mirchiwadi				7606	7606.00
Mirchiwadi to Dharam Kua				22998.61	22998.62
Dharam Kua to Mohgaon				8725	8725.00
NH to Savangi				2431.20	2431.20
Savangi to Bawanthadi				6956	6956.00
SH to Dulhapur				1200.00	1200.00
Dulhapur to Pandyer				2365	2365.00
ODR to Darasi Kala	2449.88				2449.88
Darasi Kala to Darasi Khurd	3265.35				3265.35
Darasi Kala to Khapa		1910.54			1910.55
Darasi Khurd to Nayegaon		6250.52			6250.53
Darasi Khurd to Sakhadehi		3516.72			3516.72
Pandyer to Magarkatha to Atarwani	7019.01				7019.01
Atarwani to Magarkatha		1142.96			1142.96
Total	12734.24	12820.76	0.0	52281.82	77836.82

Summary:

Overall cluster wise existing and proposed roads are as per below table.

Table 3- 18: Proposed widening and new proposed road in Pench Tiger Reserve

Cluster	Proposal for Connectivity				Total Length	Proposed Connectivity	
	Existing Pucca Road (m)	Existing Kacha Road (m)	Existing WBM Road (m)	Forest Roads		Surface Improvement Length (m)	Proposed Roads Length (m)
Turia	33925.11	14089.95	12952.07	0.00	60967.13	9312.13	2457.56
Karmajhiri	28473.11	15758.27	0.00	0.00	37637.72	6125.05	0.00
Jamtra-Kumbhpani	51992.06	8028.97	0.00	0	60021.03	5372.47	2507.60
Khamarpani	28851.26	8786.46	0.00	0	37637.72	6125.05	0.00
Dharam Kua	12734.24	12820.76	0.00	52281.82	77836.82	0	0
Total (m)	**155975.78**	**59484.41**	**12952.07**	**52281.82**	**274100.41**	**26934.70**	**4965.16**
in percentage	**56.90%**	**21.70%**	**4.73%**	**19.07 %**		**9.83%**	**1.81%**

Proposed Road Section

The thematic road section for 9 m is shown as below in figure. The width of carriage way is 6 m, with having two lanes of 3 m each. The drain on suitable side to be provided with 0.6 m width. The additional buffer of 0.4 m is provided on both side of roads. Both the side green cover of 0.6 m is proposed to maintain natural passage for animals and birds. Streetlight can be installed on suitable locations like junctions and settlements.

Figure 3. 17 A: Thematic diagram of 9 m wide road section

The thematic road section for 7.5 m is shown as below in figure. The width of carriage way is 6 m, with having two lanes of 3 m each. The drain on suitable side to be provided with 0.5 m width. Single side green cover of 0.5 m is proposed to maintain natural passage for animals and birds. Streetlight can be installed on suitable locations like junctions and settlements. These roads are the linkages to 9 m wide roads and connecting to the settlement. It is advisable to provide frequent streetlight in nearby area of settlements.

Figure 3-17B: Thematic diagram of 7 m wide road section

1.2.3.8.2 Proposal for Bus stops

To enhance the connectivity and public transport for local people as well as tourism purpose, following villages are suggested for enhancing the transportation facilities i.e. Busstop. Kurai is the major center and Block Head quarter. Proposal for Bus depo and connectivity for whole ESZ region is suggested from there. For tourism perspective, Turia, Pachhdhar, Jamtra, Dawajhir and Barelipar villages are proposed with bus stop. As the node of transportation, Banskheda, Darasi Kala and Khamarpani are proposed. These villages have potential for economic development and hence it is suggested to strengthen the transportation facilities among these villages and surrounding areas

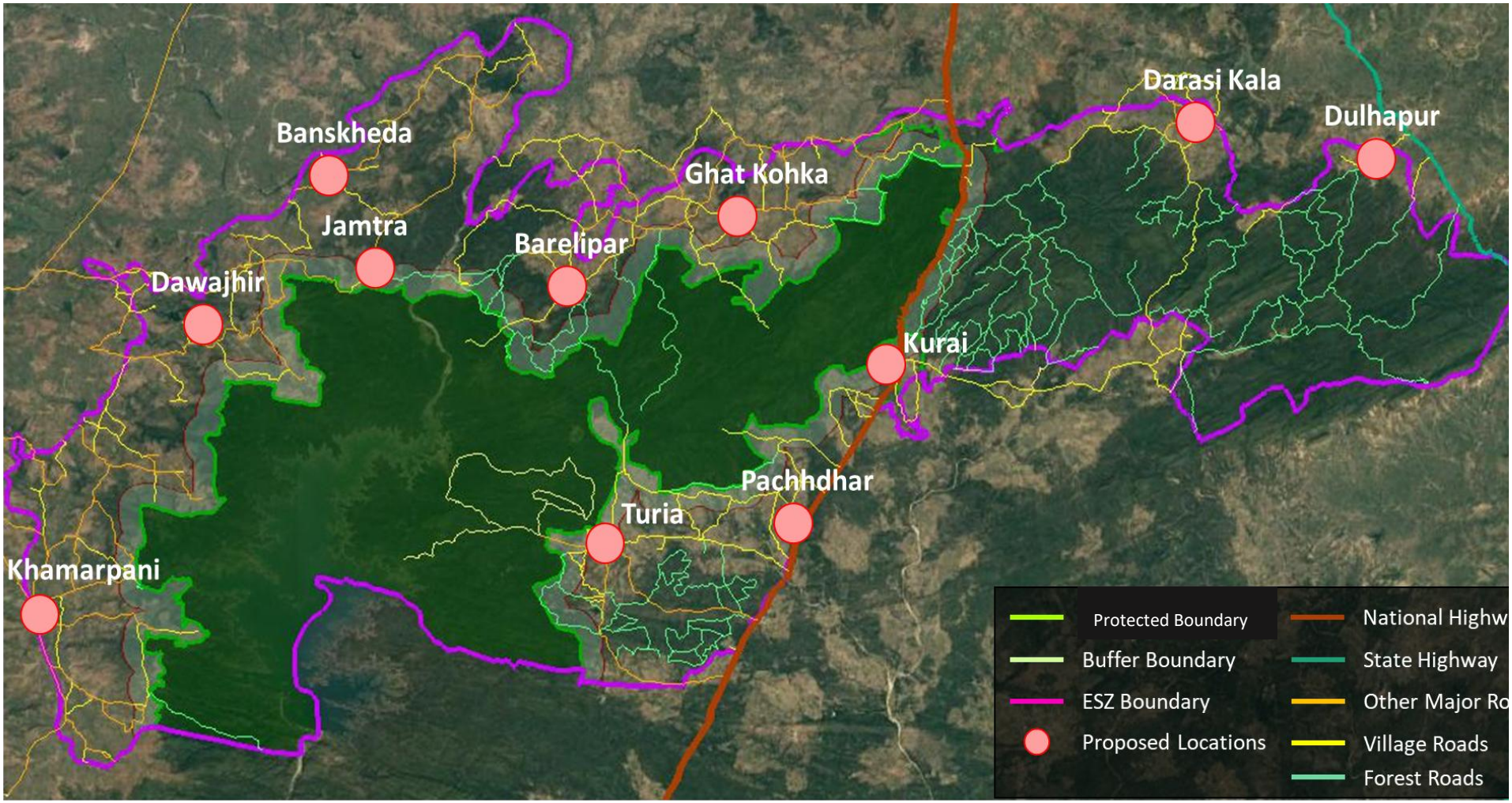


Figure 3. 18: Proposed Bus stops in Eco-Sensitive Zone

1.2.3.8.3 Proposals for Conservation and Safety

The zones can be classified as follow:

1. **Turia Cluster:**
   This cluster is the main attraction of tourists and having the most accommodation facilities of area. Being one of major tourist attraction, it has the large number of tourist footfall in area. This region is required to have the conservation safety measures on linear infrastructure. The villages covered in this cluster are Telia, Kohka, Turia, Awarghani, Satosha, Khamreeth, Ambari, Khmaba, Vijaypani, Jirewada, Durgapur, Mundiareeth, Nayegaon, Pachhdhar, Kothar, Mohgaon Yadav, Setewani, Potia, Kodajhir, Raiyarao, Pindkapar, Kurai and Arjuni. The major tourist concentration is in area of Turia and Pachhdhar.
2. **Karmajhiri Cluster**
   The area has pre-dominant agriculture in major notified villages. Safari in Protected area from Karmajhiri gate and Safari for Kumbhpani buffer is tourist attractions in area. Apart from that, there are no major tourism activities and footfall in area. There are very limited resorts are in nearby areas of Karmajhiri. The cluster includes villages of Tikari Mal, Tikari Raiyat, Karmajhiri, Paraspani, Simariya, Barelipar, Salhai, Bhodki, Ghat Kohka, Tevni, Mohgaon Titri, Panjara, Sindaria, Katangi, Murer, Dhutera, Patrai, Nivari, Alesur and Agri.
3. **Jamtra – Kumbhpani Cluster**
   This cluster has forest areas and agriculture areas both. There is only limited safari allowed from Jamtra gate. The area is dependent on agriculture activities only. The cluster has villages of Jamtra, Naharjhir, Pathri, Gumtara, Pathra Khurd, bandhan Mal, Bandhan Raiyat, Khamariya, Kharanj, Kanhasagar, Thota Mal, Thota Riyat, Dawajhir, Banskheda, Kokiwara, Dhaulpur, Madariya, Sajpani, Konapindarai, Halal Kala, Halal Khurd and Kumbhpani.
4. **Khamarpani Cluster**
   Cluster is located in southern part of Pench Tiger Reserve. There are very less forest area and predominant with agriculture and commercial areas. Khamarpani village is one major hub for commercial activities in area. The cluster includes villages of Singardeep, Silota Kala, Silota Khurd, Ghargaon, Bordi, Sirrepani, Dongargaon, Kokiwara, Antra, Kadaiya, Pulpuldoah, Marjatpur, Khamarpani, Kanhardgaon, Dainy, Devri, Sanwari, Basanpur, Kundai, Chhirewani, Thuyepani, Mohgaon Khurd, Dudhgaon, and Pulpuldoah.
5. **Dharam Kua Cluster**

Dharam Kua is the dense forest area as well as one of Tiger habitat of the area. Dharam Kua is the well-known tourist place of this cluster. Surrounded by forest, the area is needed to be conserved with proper linear conservation measures. The villages included in cluster are Rukhad, Nayegaon, Darasi Kala, Darasi Khurd, Sakhadehi, Khapa, Atarwani, Magarkatha, Pandyer, Dulhapur, Mirchiwadi, Dharam Kua, Mohgaon, Bawanthadi, and Savangi

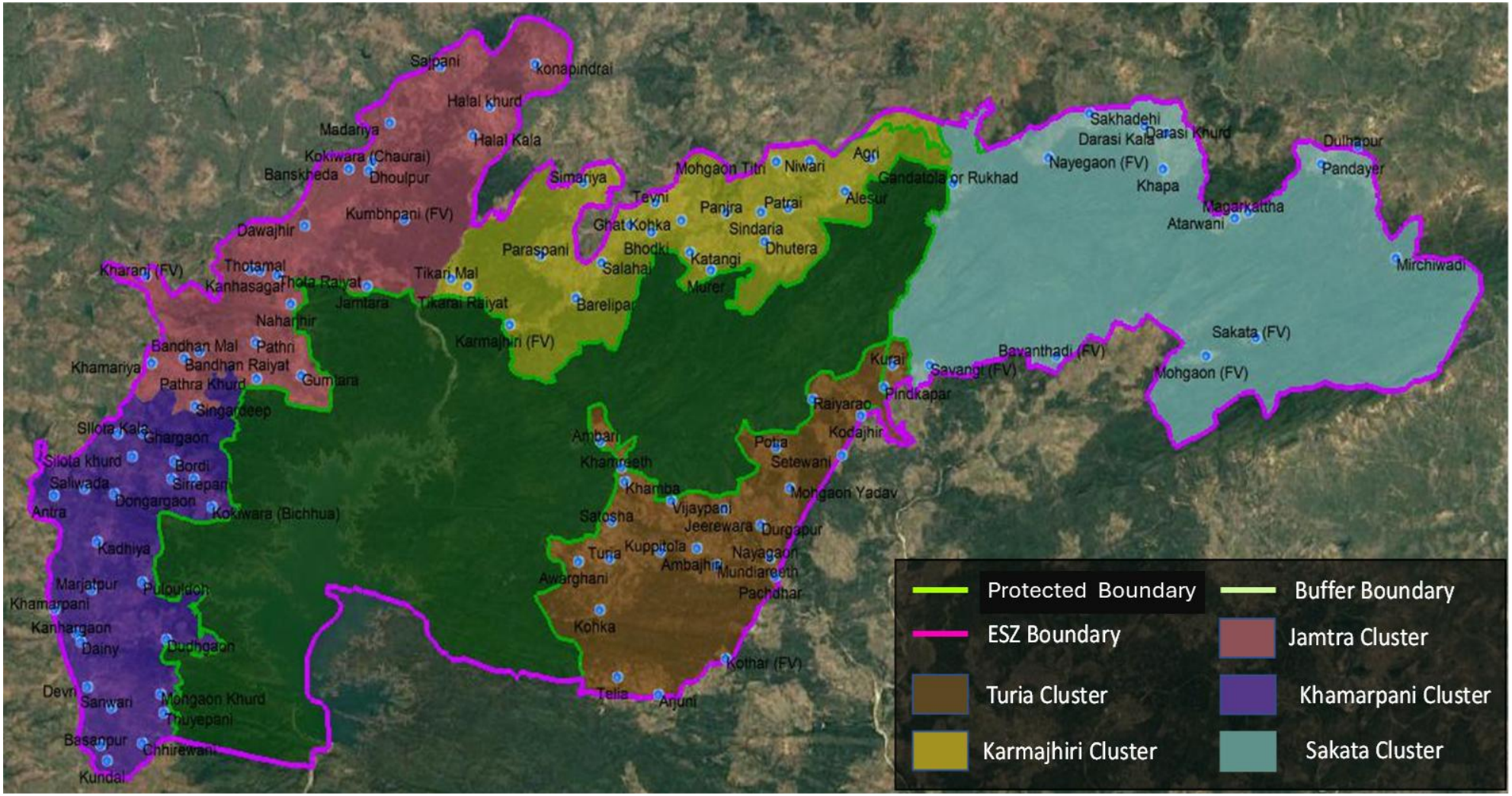


Figure 3. 19 Proposed zones for conservative Measures and Safety

1.2.3.8.4 Signages

1. **Turia Cluster:**
   As the tourism sites are in jungle area, there is presence of the animals. Signages in this zone proposed at every 2 km and at animal crossing structures for the warning. Sinages for the presence of animal should also provided at tourism sites and nearby area to acknowledge the people.
2. **Karmajhiri Cluster**
   Agriculture areas have the minimum occupancy except the wild pigs. The signages in these areas should only provide on major roads at distance of 5 km.
3. **Jamtra – Kumbhpani Cluster**
   As the tourism sites are in jungle area, there is presence of the animals. Signages in this zone proposed at every 2 km and at animal crossing structures for the warning. Sinages for the presence of animal should also provide at tourism sites and nearby area to acknowledge the people.
4. **Khamarpani Cluster**
   Agriculture areas have the minimum occupancy except the wild pigs. The signages in these area should only provide on major roads at distance of 5 km.
5. **Dharam Kua Cluster**
   Signages are frequently required in the zone as these areas have the animal occupancy and movement. signages alongside road at distance of 2 km to be provided. Signages for speed breaker as well as animal structure also provided at suitable distance.

1.2.3.8.5 Speed Breakers

1. **Turia Cluster:**
   As the areas are in forest, and animal movements are there, it is required to control the speed of the vehicles on road. Speed breakers in this zone should be provided at curvature of the roads at each end of curvature and nearby the settlement areas at both ends of settlement. On 12 m wide road speed breaker can be provided at suitable distance of 1-3 km, on 9 m and 7.5m wide road speed breaker can be provided at 1- 3 km distance. Speed breaker at both end of wildlife passage structure at distance of 500 m should be provided.
2. **Karmajhiri Cluster**
   Speed breakers in agriculture zone should be provided at curvature of the roads at each end of curvature and nearby the settlement areas at both ends of settlement. On 12 m wide road speed breaker can be provided at suitable distance of 5 – 6 km, on 9 m and 7.5m wide road speed breaker can be provided at 6-8 km distance. Speed breaker at both end of wildlife passage structure at distance of 500 m should be provided.
3. **Jamtra – Kumbhpani Cluster**
   Apart from speed breaker provided as per forest area, it should be provided near tourism sites 500 m before the entry.
4. **Khamarpani Cluster**
   Speed breakers in agriculture zone should be provided at curvature of the roads at each end of curvature and nearby the settlement areas at both ends of settlement. On 12 m wide road speed breaker can be provided at suitable distance of 5 – 6 km, on 9 m and 7.5m wide road speed breaker can be provided at 6-8 km distance. Speed breaker at both end of wildlife passage structure at distance of 500 m should be provided.
5. **Dharam Kua Cluster**
   This zone has proposed WBM roads as the area is in dense reserve forest. Speed breaker in this zone should be provided at suitable distance of 1.5-2 km and it is suggested to restrict the speed limit to 20-30 km/hr for the safety.

1.2.3.8.6 Wildlife Passages

Roads, while essential for communication and development, can impact wildlife, especially in forest areas. In addition to accidents, roads can cause habitat loss for smaller animals, as they may avoid crossing due

to constant vehicle and human movement. Linear infrastructure, like roads, fragments habitats, particularly for carnivores like tigers, leading to degraded habitats and reduced food availability. Noise from traffic can alter animal behavior, and restricted movement can increase human-wildlife conflicts and biotic pressure on the forest.

Proposed Wildlife Passage Structure in Eco-Sensitive Zone

1. **Turia Cluster:**
   Provision for wildlife passage structure would be as per Forest zone. It is observed that presence of number of animals and birds near to tourism site because of availability of foods. Canopy Bridges and natural canopy connectivity should be promoted in nearby area of the tourism sites at suitable distance of 1 - 4 km. Areas near to waterbodies like Kohka reservoir and Irrigation talab area Glider poles for birds can be provided at suitable distance of 250m-500m.

2. **Karmajhiri Cluster**
   Agriculture areas have the minimum occupancy of wild animals except the wild pigs. But for the safety of animals and to prevent the accidents, On 12 m road, box culvert can be provided at suitable distance of 2 km – 4 km, on 9 m road it can be provided at suitable distance of 3 km – 5 km and on 7.5 m wide road box culvert can be provided at distance of 5 km – 7 km. The canopy bridge and pipe structure can be provided as per presence of animals at suitable distance of 800 m-2 km on 12 m road, 1 km – 3 km suitable distance on 9 m road and 1 km to 5 km of suitable distance on 7.5 m wide road. These structures are more suitable to use with provision of wing fencing at distance of 500 m to 1 km as per suitability of structure and road at each end of structure.

3. **Jamtra – Kumbhpani Cluster**
   Provision for wildlife passage structure would be as per Forest zone. It is observed that presence of number of animals and birds near to tourism site because of availability of foods. Canopy Bridges and natural canopy connectivity should be promoted in nearby area of the tourism sites at suitable distance of 200m - 500 m. Areas near to waterbodies like Kohka reservoir and Irrigation talab area Glider poles for birds can be provided at suitable distance of 250m-500m.

4. **Khamarpani Cluster**
5. Agriculture areas have the minimum occupancy of wild animals except the wild pigs. But for the safety of animals and to prevent the accidents, On 12 m road, box culvert can be provided at suitable distance of 2 km – 4 km, on 9 m road it can be provided at suitable distance of 3 km – 5 km and on 7.5 m wide road box culvert can be provided at distance of 5 km – 7 km. The canopy bridge and pipe structure can be provided as per presence of animals at suitable distance of 800 m-2 km on 12 m road, 1 km – 3 km suitable distance on 9 m road and 1 km to 5 km of suitable distance on 7.5 m wide road. These structures are more suitable to use with provision of wing fencing at distance of 500 m to 1 km as per suitability of structure and road at each end of structure.

6. **Dharam Kua Cluster**
   The maximum area of this zone falls under the high-risk zone and the reserve forest or protected forest. The presence of animals like Gaur, Sambhar, Chowsinga, barking deer and Chittal are more in the area. For Passage to these animals, box culvert is more suitable with vertical clearance of 3.5 m. For monkeys, Squirrels and other animals canopy bridge or natural canopy connectivity is better. On 12 m road, box culvert can be provided at suitable distance of 500 m – 1 km, on 9 m road it can be provided at suitable distance of 1 km – 2 km and on 7.5 m wide road box culvert can be provided at distance of 2 km – 3 km. The canopy bridge and pipe structure can be provided as per presence of animals at suitable distance of 300-500 m on 12 m road, 500 m – 1 km suitable distance on 9 m road. Natural canopy can be more promoted in forest zone for monkey and other animals. These structures are more suitable to use with provision of wing fencing at distance of 500 m to 1 km as per suitability of structure and road at each end of structure.

1.2.3.8.7 Silence Zone

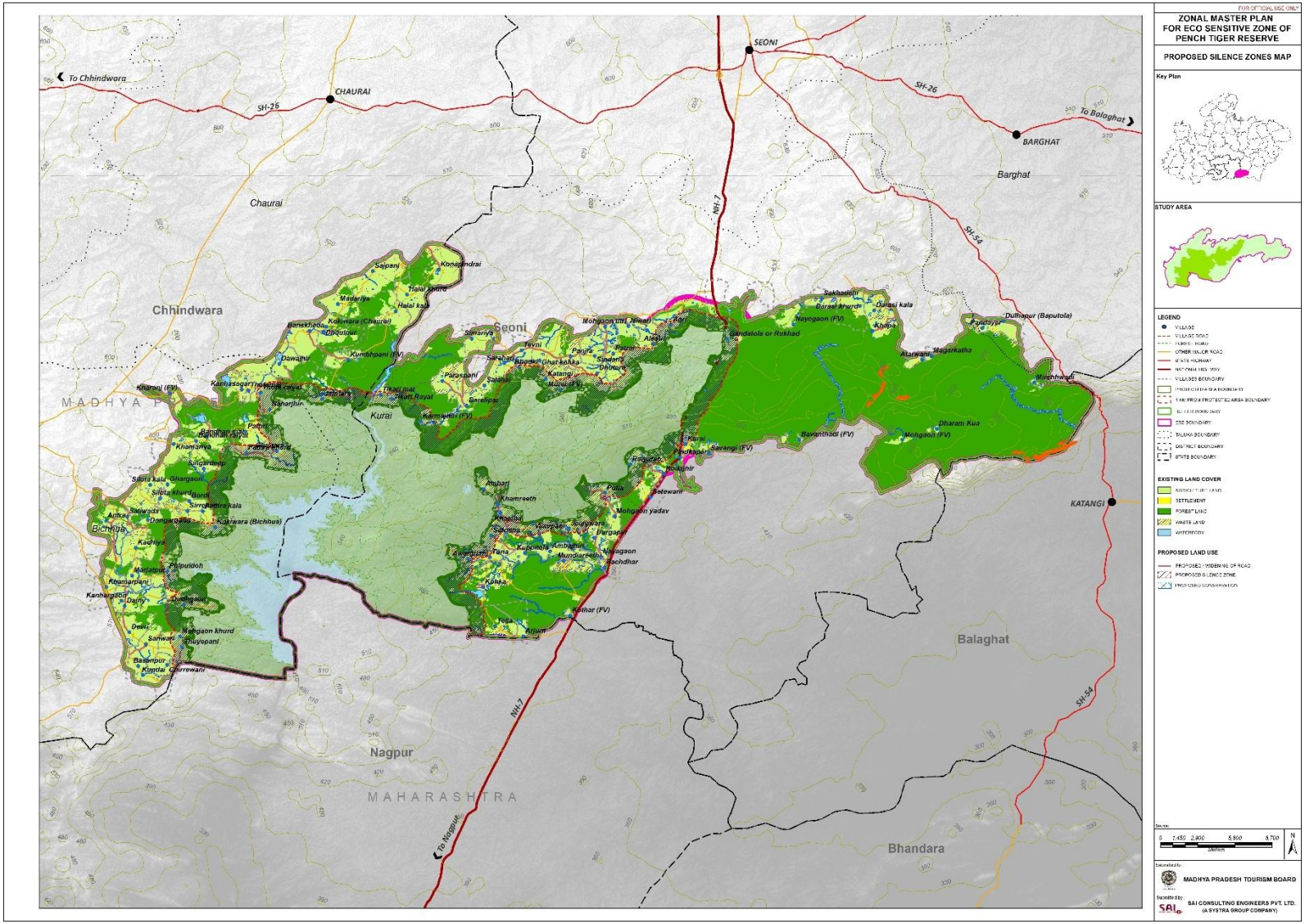


Figure 3. 20: Proposed Silence Zone in Pench Tiger Reserve

1.2.3.9 Management of Resource Extraction

Pench National Park is rich in natural resources like water, plants and trees, animals and birds and many other natural materials. Extraction of natural resources from Protected area of Pench Tiger Reserve is prohibited and designated as illegal activity. Table below provides brief about prohibited and regulated activities based on resource extraction.

Table 3- 19: Restricted and Prohibited activities based on natural resources

S No	Activity	Extraction of Natural Resources	Proposals
1	Commercial Mining	Resource extractions of minerals and other natural elements via mining	Prohibited Activities
3	Establishment of major hydroelectric project.	Extraction/storage of surface water	Prohibited Activities
4	Setting of new sawmills.	Collection of timber from forest	Prohibited Activities
5	Setting up of brick kilns.	Extraction of sand from river/ Nalla beds	Prohibited Activities
6	Commercial use of firewood	Collection of timber from forest	Prohibited Activities
7	New wood-based industry	Collection of timber from forest	Regulated Activities
8	Felling of Trees.	There shall be no felling of trees on the forest or Government or revenue or private lands without prior permission of the competent authority in the State Government. The Felling of trees is regulated in accordance with the provisions of the concerned Central of State Act and the rules made thereunder.	Regulated Activity under applicable laws and concerned departments
9	Collection of Forest produce or Non-Timber Forest Produce (NTFP)	As the process of collection of MFP involves use of fire, it is only allowed for use of local communities for livelihood. Unregulated collection can also affect local bio system of forest.	Regulated Activity under applicable laws and concerned departments
10	Protection of Hill Slopes and riverbanks.	To protect unique landscape and minerals, no mining shall be allowed. Sand extraction is one of major illegal activities in surrounding areas of riverbeds.	Regulated Activity under applicable laws and concerned departments
11	Commercial extraction of surface and ground water.	Surface water and ground water is prime necessity for whole eco-system of forest. It should be regulated in usage and extraction.	Regulated Activity under applicable laws and concerned departments

1.2.3.10 Surface and Ground Water Withdrawal

The extraction/storage of surface water is prohibited in Protected Area of Pench Tiger Reserve. The area of ESZ is majorly dependent on ground water for domestic as well as agricultural needs. As per guidelines of RDPFI, maximum allocation of water supply is 55 lpcd and 30 lpcd is mentioned. Maximum limit of 85 lpcd is advisable for water supply in notified villages of ESZ. Village wise calculation for water supply need as per projected population of year 2041 To conserve these much of needs, it is advisable to levy mandatory measures for ground water recharge and rainwater harvesting in study area.

1.2.3.11 Protection to the Source of Water

Pench Tiger Reserve has unique landscape with mountains, rivers and other natural features. Rivers like Pench and Bawanthadi with many streams flows through the PTR as potential water source to animals as well as villagers. The region has the Totladoah reservoir and many more as large potential surface water storages. The area is blessed with approximate rainfall of 1329 mm in the region but lacking to store or utilize the water as run-off because of slope is in high value. In primary survey it is observed and discussed with the villagers that the shortage of water is one of the prime issues in ESZ notified villages. The conservation measures to preserve the water resources following suitable methodologies are discussed below.

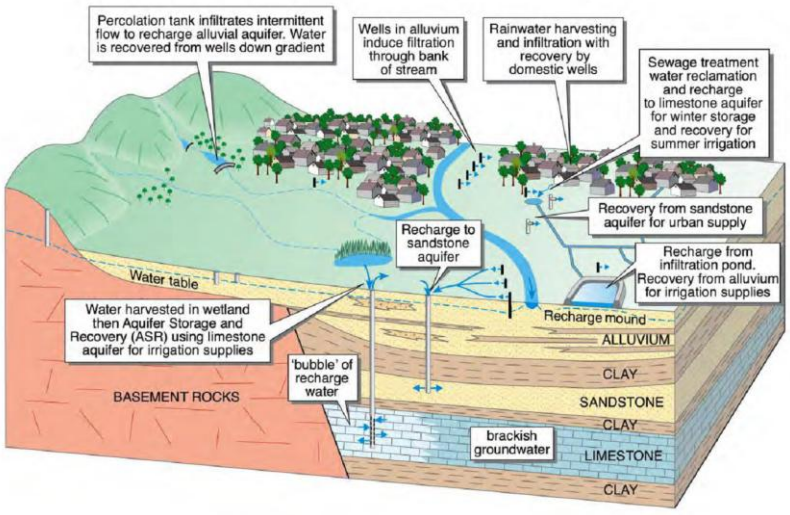


Figure 3. 21: Proposed water resource management in PTR

1.2.3.11.1 Surface water

With having a mesmerizing landscape and rivers, the region of PTR has many surface waterbodies. These waterbodies are mainly small and medium scale waterbodies like stream s and ponds. These waterbodies in Eco-Sensitive Zone area are useful for drinking and agriculture purposes.

To preserve the surface waterbodies and its surrounding characteristics, a buffer area for waterbodies is proposed. The buffer is also helpful to tackle the floods and improves the ground water level in surrounding area of waterbodies.

Riparian Buffer along waterbody

A riparian buffer is a protected area along a watercourse aimed at preserving natural ecosystems and reducing hazard risks. It works similarly to buffers for wetlands, steep slopes, and wildlife habitats. These buffers safeguard hydrologic, biological, ecological, and recreational functions. A stream setback is the minimum distance development must maintain from a riparian area, often around 50 meters, to protect the buffer zone. Larger setbacks provide greater safety from water-related hazards. These regulations limit or prohibit development, focusing on ecological protection and flood risk reduction, sometimes requiring restoration efforts like planting vegetation for permit approval.

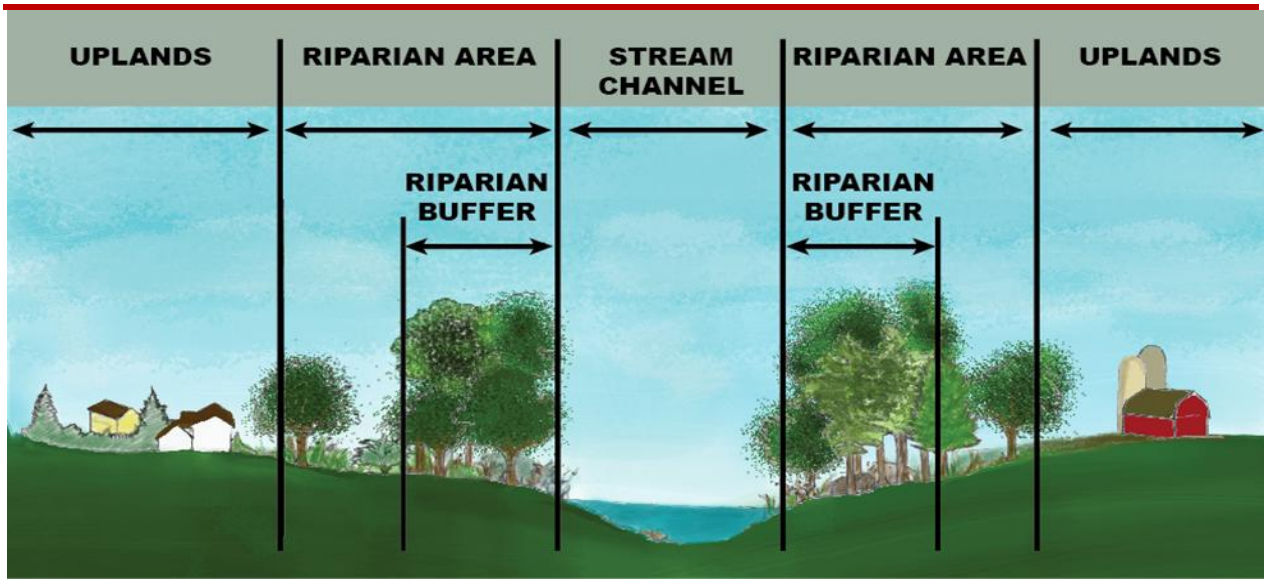


Figure 3. 22: Conceptual riparian buffer diagram

Buffers discourage excessive storm drain enclosures and channel hardening. They prevent increases in runoff from impervious cover and subsequent erosion and overflow of headwater streams. More room for best practices. Where topography, floodplain limits, and groundwater limits allow, buffers provide more room between developed areas and streams for the placement of best practice modifications, like storm-water ponds. They also improve septic system performance. Even a modest buffer provides space and access for future stream restoration, bank stabilization, or reforestation.

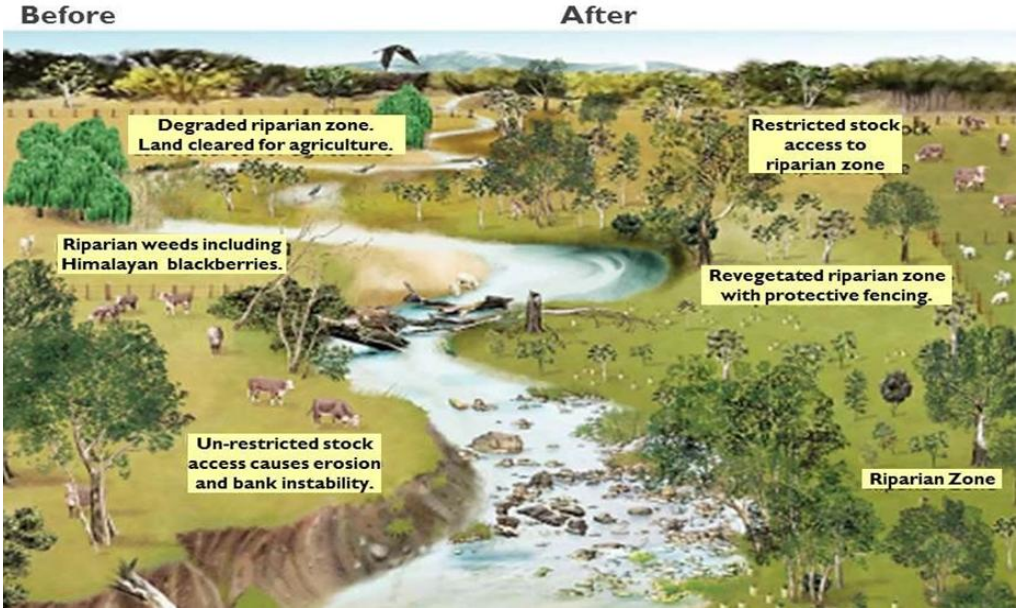


Figure 3. 23: Effects for Riparian zone

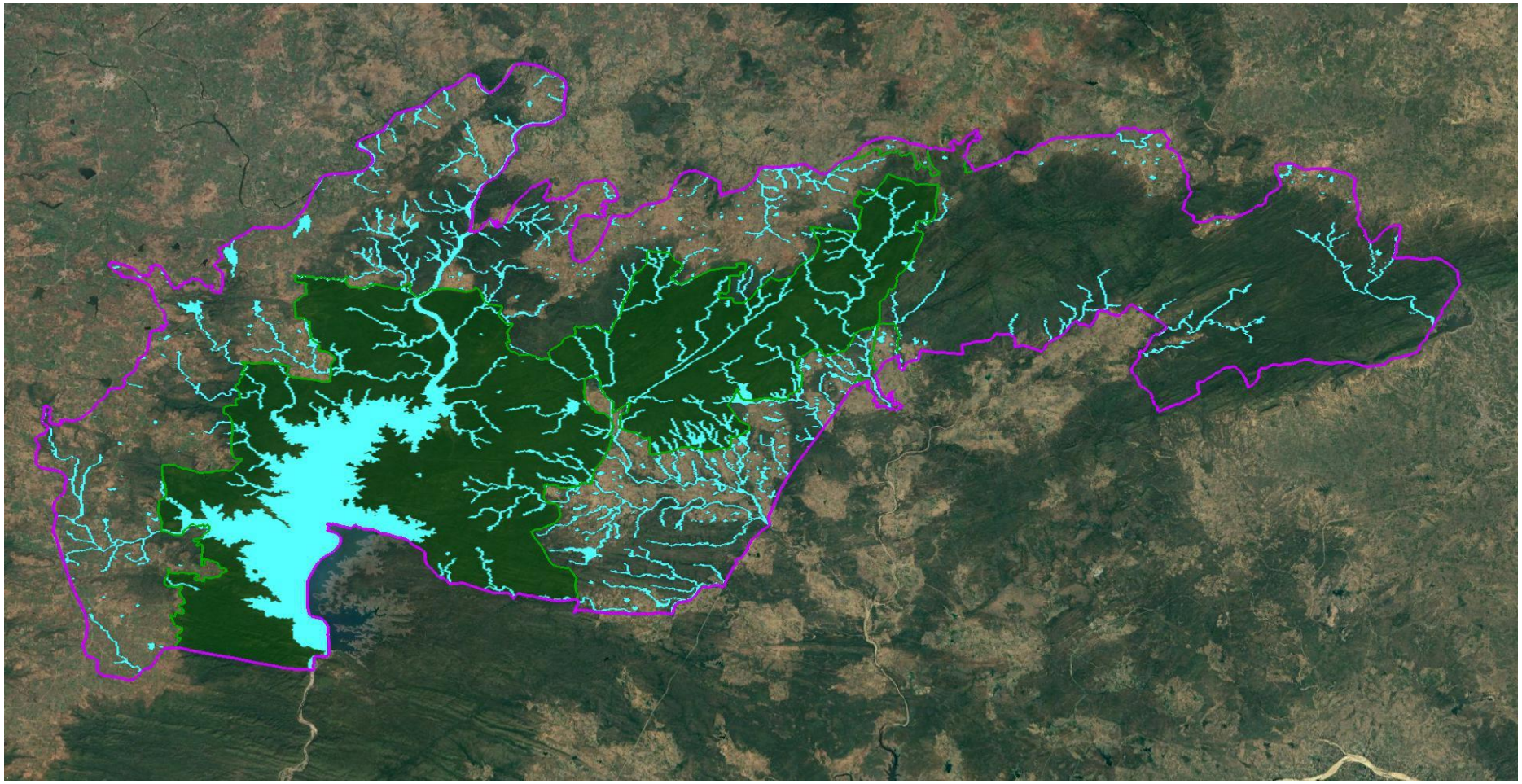
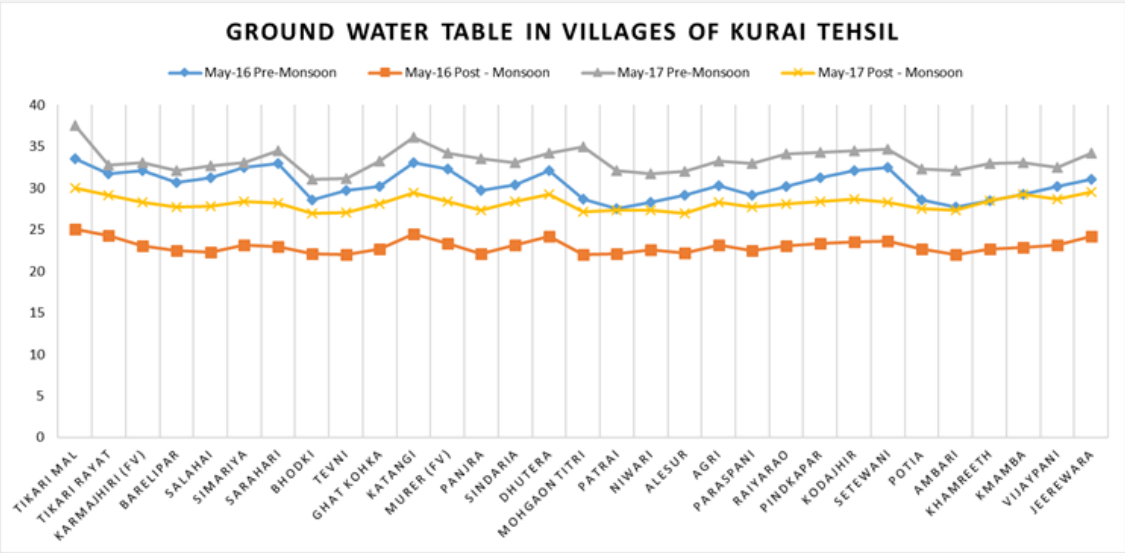


Figure 3. 24: Surface water sources in PTR

1.2.3.11.2 Ground water

Ground water situation in PTR is recharged naturally from surface water because of its undulating landscape. But as the region is hilly and having high slopes, run-off from rain water is high. As per availability of data, the Ground water level for ESZ notified villages are as shown below. Most of the villages have depleting ground water level comparing to last year. There is very less increase in ground water level in notified villages of PTR.



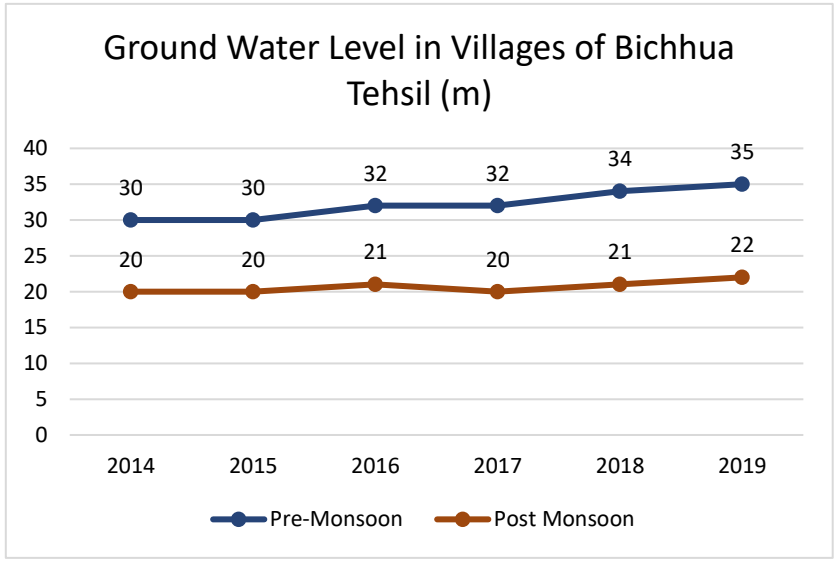


Figure 3. 25: Ground water scenario in PTR

Ground water Recharge Techniques

Ground water aquifers can be recharged by various kinds of structures to ensure percolation of rainwater in the ground instead of draining away from the surface. Suitability as per primary survey with pro and cons of technique are as discussed below table.

Table 3- 20: Ground water recharge techniques and suitability for PTR

Sr. No.	Technique	Pros	Cons	Suitability (Yes/ No)
1	Recharge wells	1. Geographically suitable. 2. The recharge pit and the injection shaft can affect recharge at the rate of 192 and 2600 cubic meters per day respectively. 3. Reduction of salinity 4. Cost effective	1. Chances of well clog. 2. Problems in land acquisition 3. High water quality requirement	No
2	Recharge Pits	1. Cost effective structure for rainwater harvesting 2. It can be constructed at household level for rooftop rainwater harvesting	1. Due to shallow depth structure, it is not preferable for rocky sub surface strata 2. It is not preferable in area where confined aquifer is much lower from ground surface.	No
3	Recharge Shaft	1. It does not require acquisition of large piece of land as in case of percolation tanks. 2. There are practically no losses of water in the form of soil moisture and evaporation, which normally occur when the source water must traverse the vadose zone. 3. Disused or even operational dug wells can be converted into recharge shafts, which does not involve additional investment for recharge structure. 4. Technology and design of the recharge shaft is simple and can be applied even where base flow is available for a limited period.	1. In the areas where source water is having silt, the shaft should be filled with boulder, gravel and sand to form an inverted filter. 2. The upper most sandy layer must be removed and cleaned periodically. 3.When water is put into the recharge shaft directly through pipes, air bubbles are also sucked into the shaft through the pipe, which can choke the aquifer.	Yes
4	Dug well Recharge			No
5	Percolation tank with pit shaft or wells	1. Percolation tanks are easy to maintain overall.	1. Regular maintenance is required. 2. Limited water storage capacity	Yes
6	Check dams/	1. 1. Relatively inexpensive and easy to construct.	1. Moderate maintenance needed.	Yes

Sr. No.	Technique	Pros	Cons	Suitability (Yes/ No)
	Masonry Dams	2. Reduces sedimentation. 3. Can be more easily used higher in the watershed. 4. Reduce velocity and may provide aeration of the water.	2. Check dams are only suitable for a limited drainage area. 3. Reduce the hydraulic capacity of the channel.	
7	Boulders/ Nala Bunds			Yes
8	Gabion Structure	1. These structures are permeable and do not need extra drainage system. 2. These are cheaper than other engineering structures when stones are available in sufficient quantity.	1. Low habitat value.	Yes

Proposed Methodologies for ground water Recharge

Proposed different methodologies for recharging ground water are as discussed below. A suitable method can be implemented after performing site suitability analysis and feasibility study in the region.

Recharge Shaft

Recharge Shafts are similar to recharge pits but are constructed to augment recharge into phreatic aquifers where water levels are much deeper, and the aquifer zones are overlain by strata having low permeability. Further, they are much smaller in cross section when compared to recharge pits.

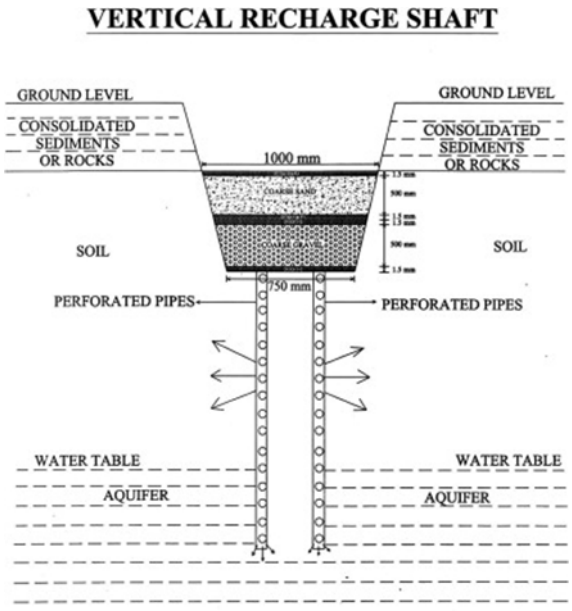


Figure 3. 26 Thematic diagram of recharge shaft

Percolation tank with pit shaft or well

These are the most prevalent structures in India as a measure to recharge the ground water reservoir both in alluvial as well as hard rock formations. The efficacy and feasibility of these structures is more in hard rock formation where the rocks are highly fractured and weathered. In the States of Maharashtra, Andhra Pradesh, Madhya Pradesh, Karnataka and Gujarat, the percolation tanks have been constructed in plenty in basaltic lava flows and crystalline rocks. These are found to be very effective in Pench Mountain front area in Maharashtra.

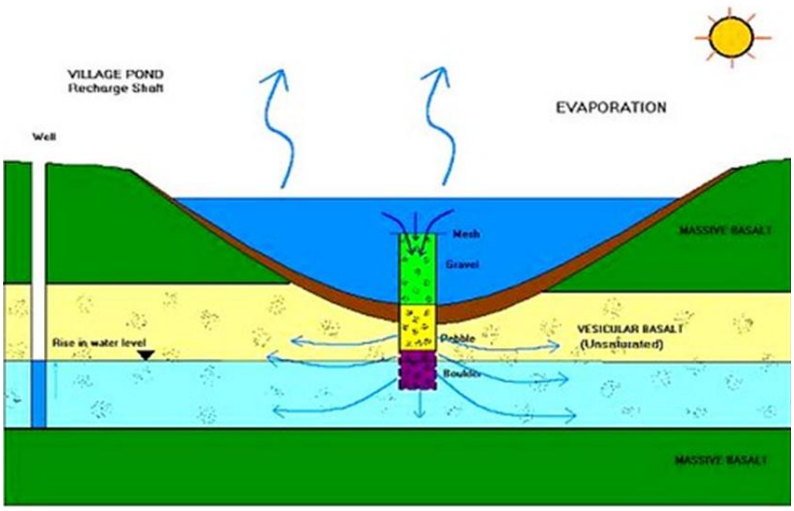


Figure 3. 27 Thematic diagram for percolation tank with recharge shaft or well

The percolation tanks are however also feasible in mountain fronts occupied by talus scree deposits. The percolation tanks can also be constructed in the Bhabar zone. Percolation tanks with wells and shafts Percolation tanks are also constructed to recharge deeper aquifers where shallow or superficial formations are highly impermeable or clayey with certain modification.

Check dams/ Masonry Dams

Check dams are built across small, gently sloping streams, suitable for both hard rock and alluvial formations. The site should have a permeable bed or weathered formation to allow rapid water recharge. These dams, usually less than 2 meters high, store water within the stream course, allowing excess runoff to flow over the wall. To prevent scouring, water cushions are placed downstream. A series of check dams can be constructed along the stream to enhance regional water recharge.

Figure 3. 28 Check dams on river, streams and Nalla

Boulders/ Nala Bunds

A series of small bunds or weirs are made across selected nala sections such that the flow of surface water in the stream channel is impeded and water is retained on pervious soil/tock surface for longer body. Nala bunds are constructed across bigger nalas of second order streams in areas having gentler slopes. A nala bund acts like a mini percolation tank.

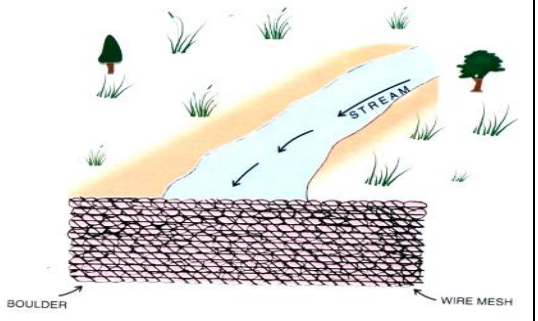


Figure 3. 29 Thematic diagram for Boulder on streams

Gabion Structure

This is a kind of check dam being commonly constructed across small stream to conserve stream flows with practically no submergence beyond stream course. The boulders locally available are stored in a steel wire. This is put up across the stream's mesh to make it as a small dam by anchoring it to the streamside. The height of such structures is around 0.5 m and is normally used in the streams with width of about 10 to 15 m. The cost of such structures is around Rs.10 to 15000/-. The excess water overflows this structure storing some water to serve as source of recharge. The silt content of stream water in due course is deposited in the interstices of the boulders to make it more impermeable. These structures are common in the State of Maharashtra, Madhya Pradesh, Andhra Pradesh etc. Feasibility study and hydrological study should be carried out before implementation of the technique for ground water recharge.

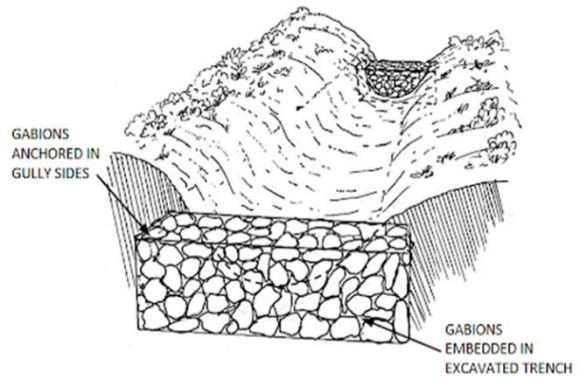


Figure 3. 30 Gabion structure on water bodies

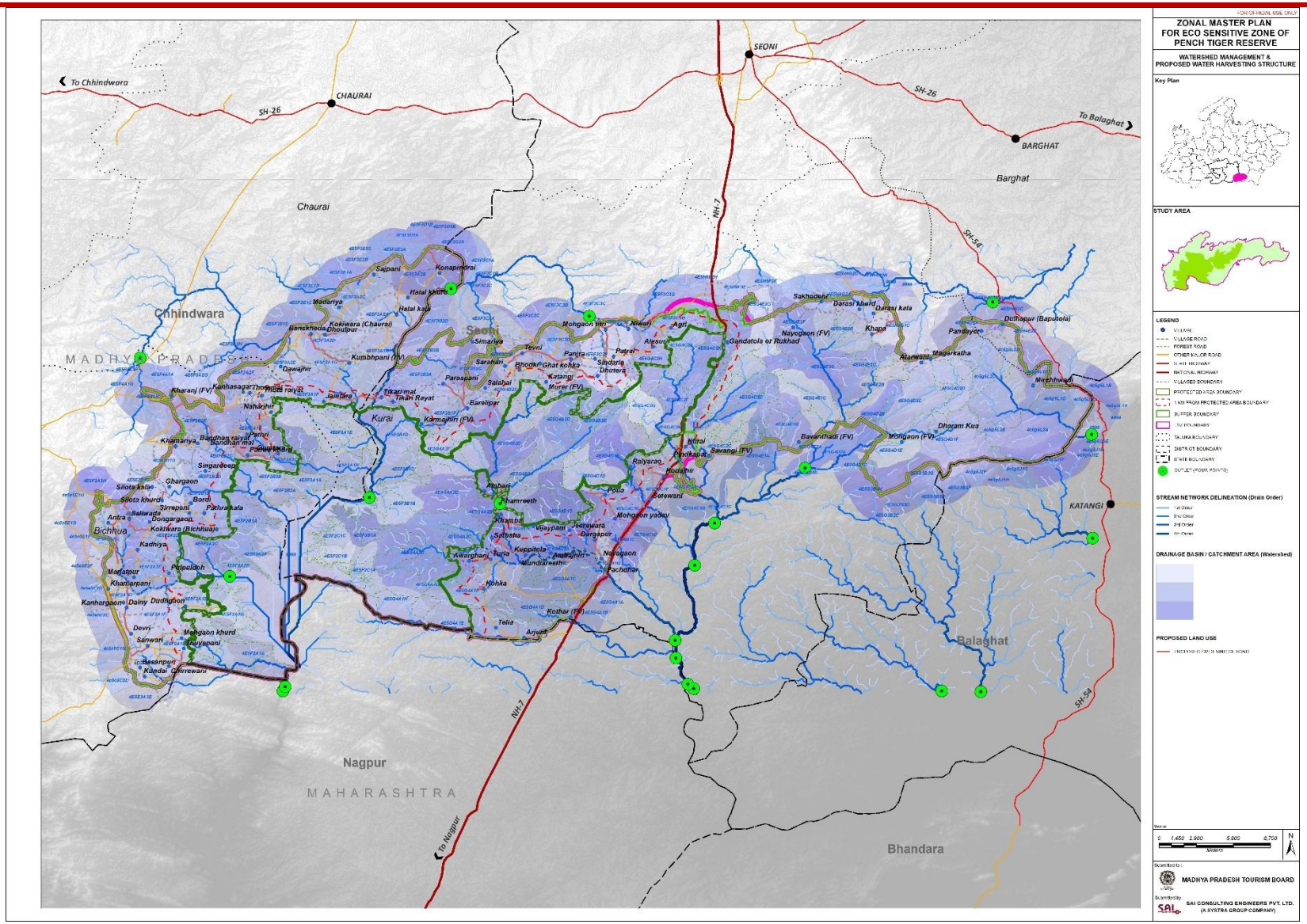


Figure 3. 31: Watershed Management

1.2.3.12 Development of Resilience to Climate Change

Conventional energy sources like coal, petrol, diesel and wood can damage the local environment. This could result in loss of forest cover and loss of habitat of animals. To prevent these consequences, non-conventional energy sources like sun, electricity and wind should be promoted. As PTR is covered largely with forest area, it is not possible to establish wind units in large numbers. So, Solar and biogas can be helpful at an extent to reduce the dependencies on conventional fuels. EV should be promoted to eliminate CO_2 emission through vehicles and noise in forest area.

1.2.3.12.1 Promotion of non-polluting Mobility

Suggestion for Alternative Fuel based vehicles an alternative fuel technology may be defined as a technology solution which powers the vehicle by any fuel other than the conventional petroleum-derived fuels (diesel or petrol); it can be primarily referred to any technology of engine powering that does not entail solely petroleum such as solar powered, electric vehicles or hybrid electric vehicles. Such a vehicle is therefore cleaner and safer for the environment. While it is widely agreeable that there is an urgent need to decarbonize the transport sector, the development and wide-scale use of E-vehicles is important due to a number of factors such as reducing air pollution and greenhouse gas emissions, reduction in noise pollution in area and many more.

Pench Tiger Reserve is the attracts tourists with rich forest diversity and movement of wildlife. Turia has high numbers of visitors in weekends from surrounding urban centers. To minimize the pollution in area and enhance eco-tourism activities, few bicycle points and e-bike points are suggested. Turia, Dharam Kua, Barelipar, Banskheda and Dawajhir are proposed with e-bike and bicycle locations.

1.2.3.12.2 Electric Vehicles for Safari

In tiger reserves, safaris are a primary way to spot wildlife, traditionally using petrol or diesel-powered 4x4 vehicles that produce noise and pollution. The quiet operation of EVs makes wildlife less fearful, allowing closer encounters without disturbing them. Additionally, these vehicles offer a smoother, more serene ride, enhancing the overall experience, enabling guests to hear animals more clearly, and capture better photos. By reducing environmental impact and offering a more immersive safari experience, electric vehicles are a sustainable solution for eco-conscious wildlife tourism.

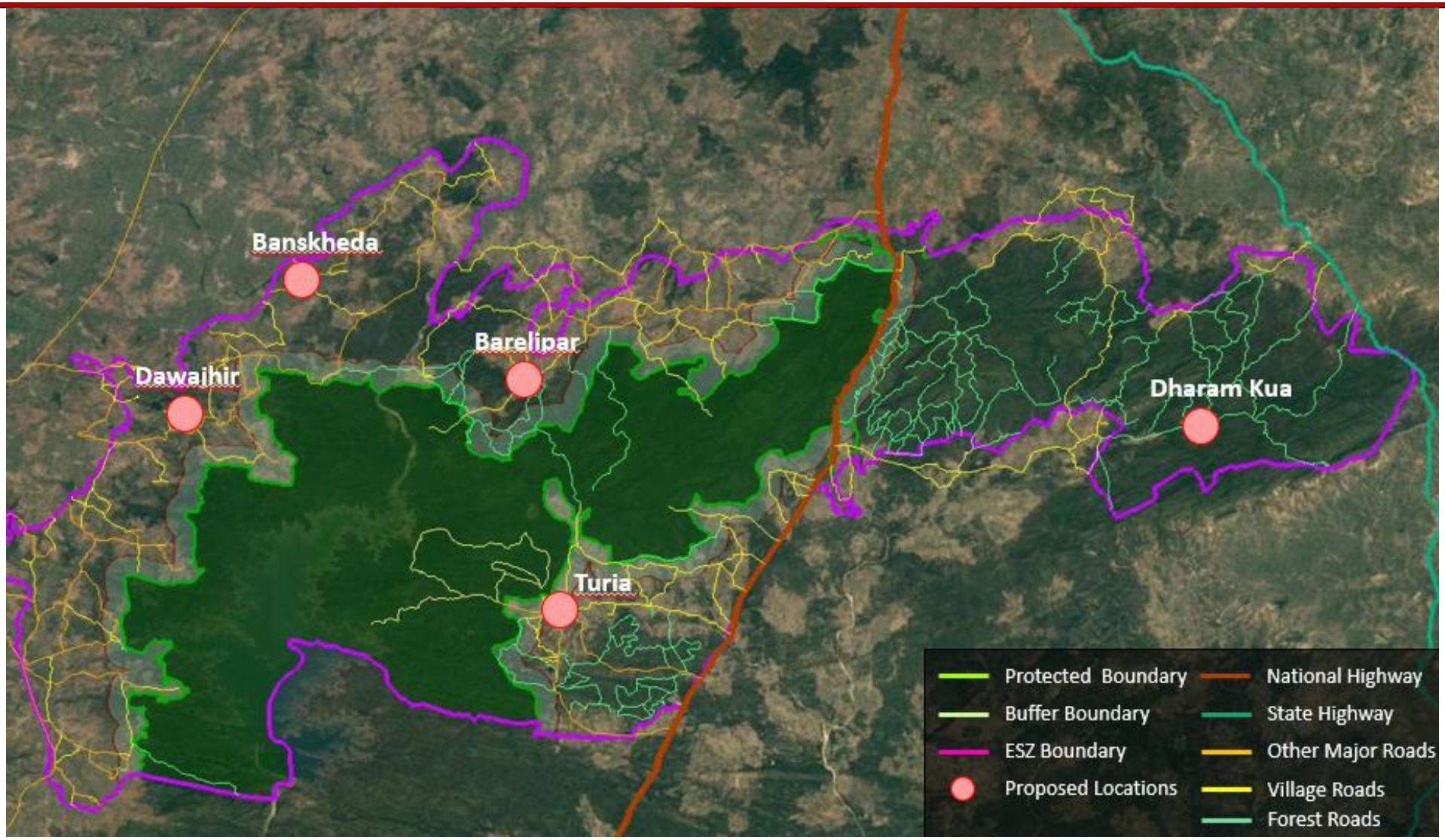


Figure 3. 32 E-Bike and Cycle stand location

1.2.3.12.3 Solar Energy

Non-conventional energy sources, like solar power, should be promoted in PTR to protect wildlife and forest cover. Conventional electricity lines often disrupt wildlife habitats and cause accidents. Solar power can provide an alternative for agriculture and domestic use in PTR villages. While solar energy may not be reliable year-round, village- or cluster-based solar power production is a feasible solution.

Although all villages in the ESZ are grid-connected, not all farmlands are electrified, and those that are receive limited power (8 hours/day). This power shortage forces farmers to rely on diesel generators, which are costly and unsustainable, hindering productivity and contributing to the agrarian and climate crisis.[4] As per primary survey, it has come to know that there is no regular power supply in the villages specially in monsoon season.

Solar energy can be use in various ways in the villages of ESZ like use of solar water pump for water supply and irrigation purpose in farms, rooftop solar in schools and other government buildings, solar street lights in the villages, use of solar energy for small commercial or industrial use etc.

Community pumping solution enables smallholding farmers to access water for irrigation year-round according to a calendar that guarantees supply when they need it, including during dry seasons. Our tariffs reduce the cost of irrigation by up to 20% compared with diesel-powered pumps. Training of farmers on pump use and efficient agricultural practices, such as growing high-value crops, intercropping and multicropping, helps increase farm productivity. This allows farmers to increase crop yields by up to 30% and increase their income by over 40%, while developing new skills.

Each pump allows 10-20 farmers depending on landholding to access water on demand using a smart pre-paid card.

[4] https://www.oorjasolutions.org/

1.2.3.12.4 Biogas

To convert waste into energy, biogas plants can be set up at the community or individual level in rural areas of PTR. The biogas generated from organic waste, including livestock dung, can be used for domestic cooking, reducing dependence on firewood from forests. This also creates a local supply chain for gas production.

Most villages in the ESZ are tribal, with many located in remote forest areas, where villagers, especially women, rely on firewood for cooking. This requires hours of collection, and the smoke from firewood is harmful to health, contributing to respiratory issues and CO2 emissions.

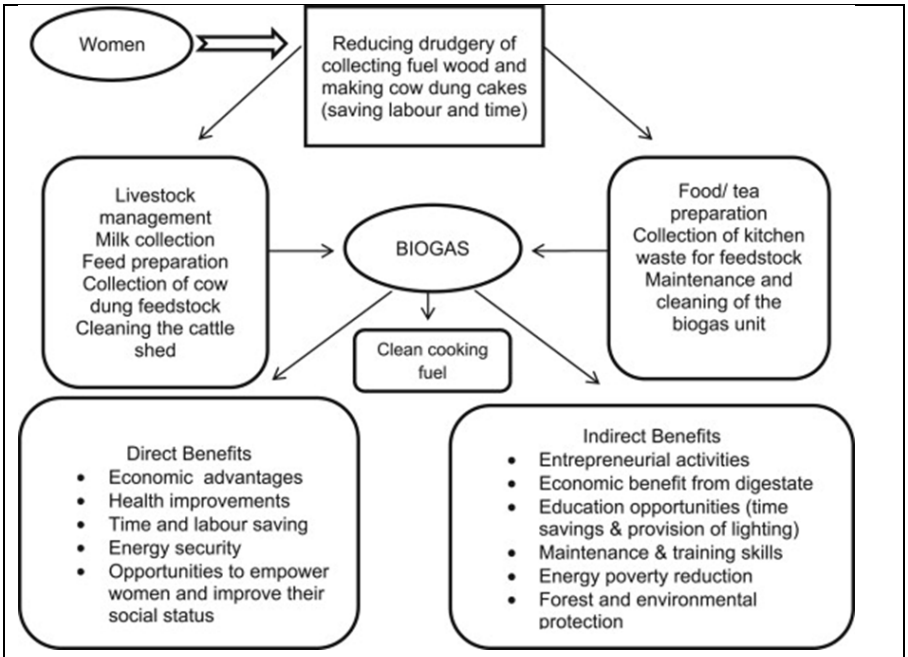


Figure 3. 33 Promotion of Biogas

Biogas offers a cleaner, more sustainable alternative. It uses cow dung and other organic waste, which are readily available in most households with livestock. Biogas plants, whether at the household or community level, have proven successful in improving health, reducing pollution, and enhancing the quality of life. Additionally, biogas slurry can be used as an organic fertilizer, reducing reliance on expensive chemical fertilizers. By capturing methane, biogas plants also help prevent greenhouse gas emissions, contributing to environmental protection. This solution provides both renewable energy and organic manure, offering significant benefits to rural communities.

Table 3- 21: Economic Benefit of Biogas

S. No.	Particulars	Annual Saving	Amt. Rs.
1.	Reduces dependency on LPG cylinders@ one per month	12 Nos.	8400
2.	Produces good quality enriched bio fertilizer to improve soil fertility @50 Kg per day	182.00 Qtl @200/Qtl	36400
3.	Reduces time wastage in collecting firewood/making dung cake @ 1.0 hour daily	45 man days @ 150/day	6750
4.	Promotion of Organic farming without , saving of chemical fertilizers @ Rs.2500/acre /year	1 acre each	2000
5.	Reduction in women drudgery	Total	53550

Likewise cost (Rs. 36000/-) of gobargas plant installation can be meet out in first year. Initiation of Government regarding installation of family size gobar gas plants at each farmer's house having five or more milch animals can minimize the requirement of LPG cylinders and can promote organic farming in villages.

All of them are of the conventional Indian (KVIC) design. The plants are spread over three sites in the village to ensure a uniform pressure in the gas distribution system. Each of the sites measure 50m X 50m approximately. The biogas plants are fitted with mechanical stirrers for mixing the inlet dung slurry.

Government Initiatives for promotion of Biogas:

1. Gobar Dhan Yojna:

• Galvanizing Organic Bio-Agro Resources -Dhan' (GOBAR-DHAN)
• Part of Clean India Mission (Rural) to manage rural biowaste.
• Rural India generates enormous quantities of bio-waste including animal waste, kitchen leftovers, crop residue, market waste and faecal sludge.
• GOBAR- DHAN announced in February 2018:
  o To harness Bio-waste to generate bioenergy in the form of Biogas available in the villages
  o To create clean environment in the villages
• Biogas plants to be set up by Self Help Groups, Gram Panchayat, Bulk Waste generators and Entrepreneurs.
• States, districts and gram panchayats are key stakeholders for the scheme
• Financial Support(back-end) is provided for setting up of Biogas Projects.
• The total assistance is on the basis of total number of households in each gram panchayats.

2. New National Biogas and Organic Manure Programme (NNBOMP)

• The main target of the scheme is Rural area.
• The main objective is to provide clean cooking fuel for kitchens, lighting and meeting other thermal and small power needs of agriculture/ dairy farmers and other individual household users.
• To improve supply of organic bio-manure system based on biogas plant slurry to reduce use of chemical fertilizers.
• Promotion of decentralised renewable energy for heating/ cooling from biogas for dairy cooperatives, individual farmers / organisations and community.
• Back-ended capital subsidy is provided for setting up biogas plants.

3. National Biogas and Manure Management Programme (NBMMP)15

• This programme is mainly catered to setting up of family type biogas plants. It has been under implementation since 1981-82.
• The programme was implemented by State Nodal Agencies (SNAs)/State Nodal Departments (SNDs) like Agriculture Department, District Rural Development Agencies (DRDAs) and Khadi and Village Industry Commission (KVIC) centres
• The main objectives of the scheme were to provide clean bio-gaseous fuel mainly for cooking purposes; for reducing use of Liquified Petroleum Gas (LPG) and other conventional fuels; and to provide bio-fertilizer/ organic manure to reduce use of chemical fertilizers
• NBMMP provides for grant of central subsidy to the plant; turn-key job1 fee linked with five years free maintenance warranty; financial support for repair of old non-functional plants; training of users, staff, entrepreneurs, etc. and publicity and communication. CFA was being released to the concerned SNA/ SND and other implementing agencies at the rate of ` 16,700 per plant for North Eastern Region (NER) States and ` 8,000 to ` 10,000 per plant for other States.

1.2.3.12.5 Conservation of Night Sky

Artificial light pollution is affecting humans, wildlife, and the environment. It reduces the visibility of stars and celestial objects, mainly due to "skyglow" from poorly designed lamps and floodlights. This wasted light is scattered in the atmosphere, obscuring the night sky. The effect can be seen far from its source, impacting both astronomers and casual sky observers.

To address this issue, the International Dark Sky Association (IDA) has proposed dark sky reserves, classified into dark sky parks, reserves, sanctuaries, and urban night sky places. IDA has designated 133 International Dark Sky Places, protecting nearly 100,000 sq km of dark areas globally. An IDA International Dark Sky Reserve is a public or private land with exceptional starry nights and nocturnal environments, protected for scientific, cultural, and public enjoyment. These reserves are formed through partnerships between multiple land managers, ensuring sky quality and natural darkness preservation.

IDA's four strategic priorities are: Celebrate The Night, Dark Sky Protection, Lighting Where We Live, and Skyshed Restoration, all aimed at reducing light pollution and preserving the natural nighttime environment.

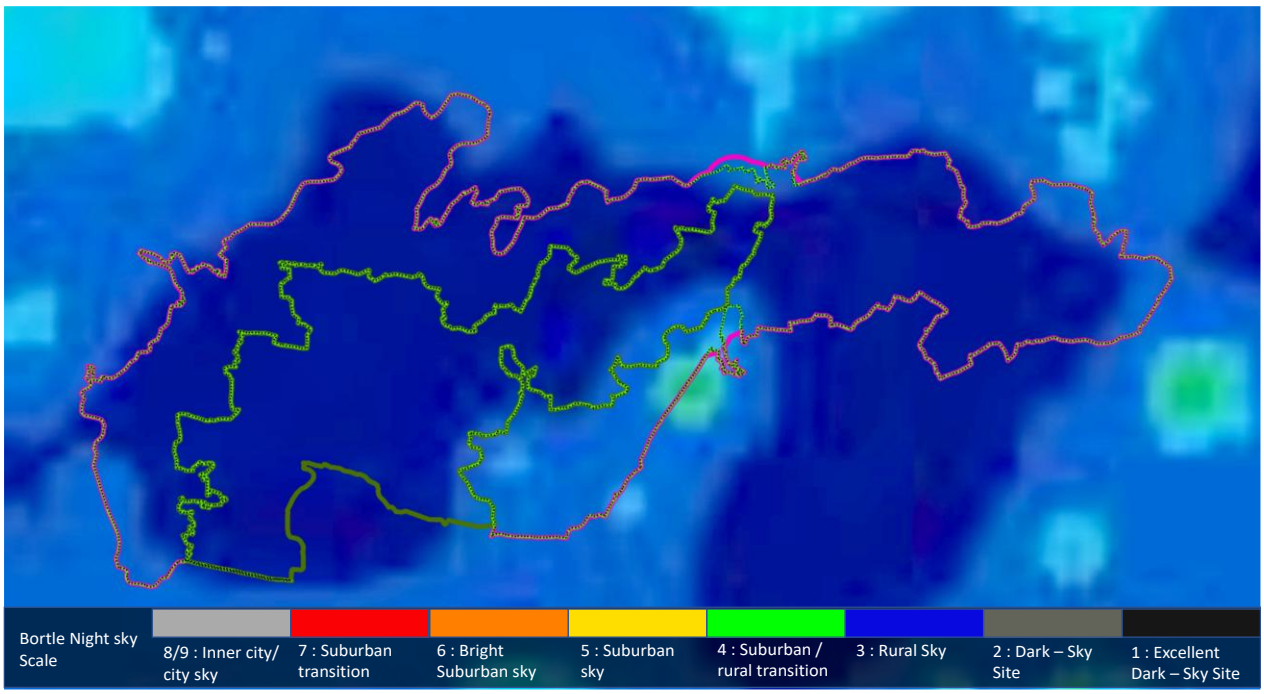


Figure 3. 34: Dark sky analysis with Bortle sky scale

(*Source : https://darksitefinder.com/maps/world.html#11/22.4634/438.3607*)

The analysis for the night sky can be represented with the Bortle Night Sky Scale assesses the quality and suitability of dark night skies. Most of Pench Tiger Reserve (PTR) falls under scale-3, indicating a rural sky site. Some southern and eastern areas of PTR may qualify for dark sky designation, transitioning from scale-2 to scale-3 skies. However, urban areas and settlements like Kurai, along NH48, contribute to bright skies due to high population density.

Given this, PTR could apply for Dark Sky Reserve designation. The criteria include being at least 700 km², publicly accessible, and legally protected for scientific, educational, cultural, or public enjoyment. The area must offer an exceptional dark sky resource, with night sky brightness darker than 20 magnitudes per square arc second, relative to surrounding communities.

Suggestive Guideline Principle for Lighting in ESZ

1. Lights to be installed only where it is required
2. Lights to be directed/ focused towards only needed place
3. Lights not to be brighter than decided standards. i.e. Restrict the use of halogen lights.
4. Lights to be use for warmer colours

1.2.3.12.6 Measures for pollution control

Pench Tiger Reserve area has the approximate 60% of area is covered with forest. These dense forest of Pench, helps to eliminate the pollution in region and freshens the air. But, Turia is the popular tourism destination and approximate, 1 lakh people visit in a year. This tourism destination increases bio pressure on forest of PTR.

Establishing PUC Centers

There are no measuring stations and data available for PTR regarding any kind of pollution. Absence of the measuring station is the main cause of not having data. As the tourism sites are proposed in all over PTR, vehicular movements will be increased and so does the air pollution. Because of that PUC Centers is

necessary for forest and to control the pollutants in area. By considering the carrying capacity and tourist footfall, total 6 numbers of air monitoring stations are proposed in Eco-Sensitive Zone.

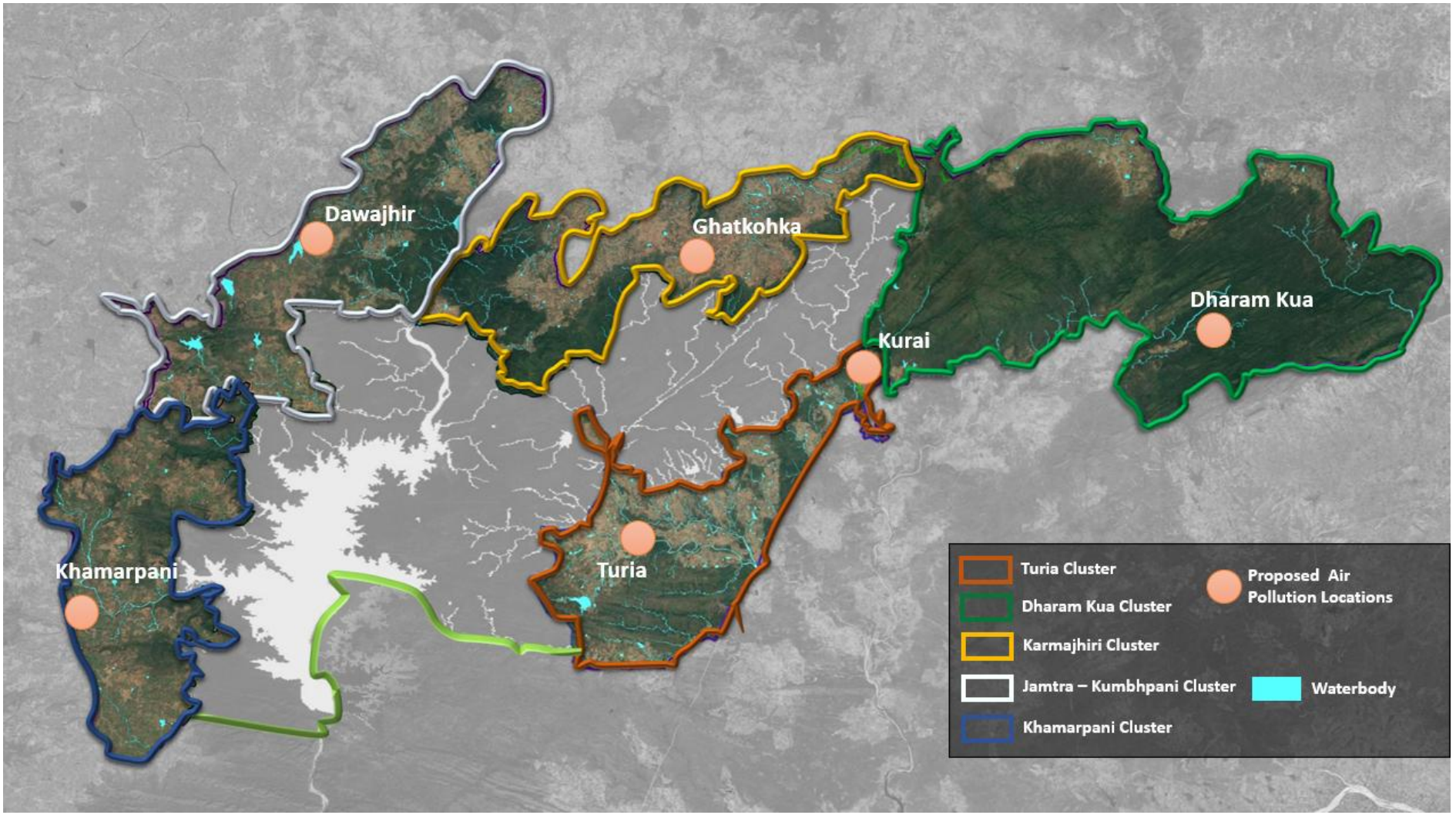


Figure 3. 35: Proposed air pollution measurement stations

The air monitoring stations to be established and managed by the Madhya Pradesh Pollution Control Board. The data on monthly basis to be provided to PTR office and Monitoring committee for regular monitoring of the area.

Measures for water pollution

The sample for water pollution measurements shall be collected with random sites for regular time intervals. The suggestion for regular at least in 1 year before and after rainfall sample should be collected and analysed for waterfall sites with Lakes, rivers nearby area of settlements, proposed camping sites and accommodation, reservoirs and ponds.

Measures for Noise Pollution

Wildlife can be disturbed through the noise of vehicles or sounds. Continuous loud sound or noise may cause animal to leave their habitat or change the routes of movements. Birds are the mostly migrate because of noise pollution. To eliminate the noise pollution, the silence zone is proposed in 1 km periphery of Protected Forest area of Pench Tiger Reserve to preserve the animal habitat and movement in Protected area and buffer zone. The silence zone is provided in 1 km form of Protected area boundary.

Apart from that, the proposal for noise observatory and measurement centers is proposed in areas of Dharam Kua, Rukhad, Kurai, Barelipar and Banskheda. The establishment and management of these centers to be done by MPPCB and monthly data to be share with PTR for management and conservation purpose.

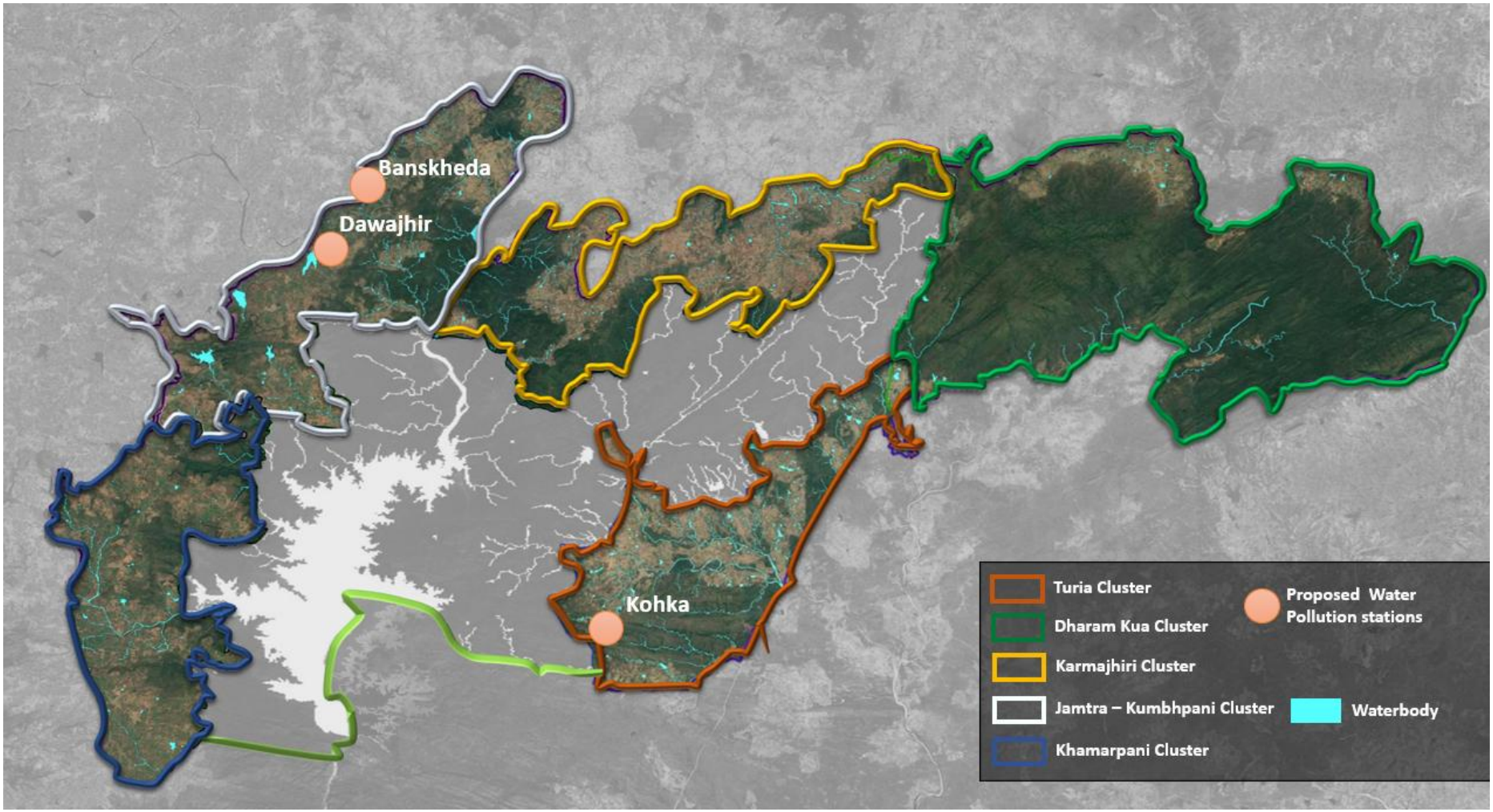


Figure 3. 36: Proposed Water pollution measurement stations

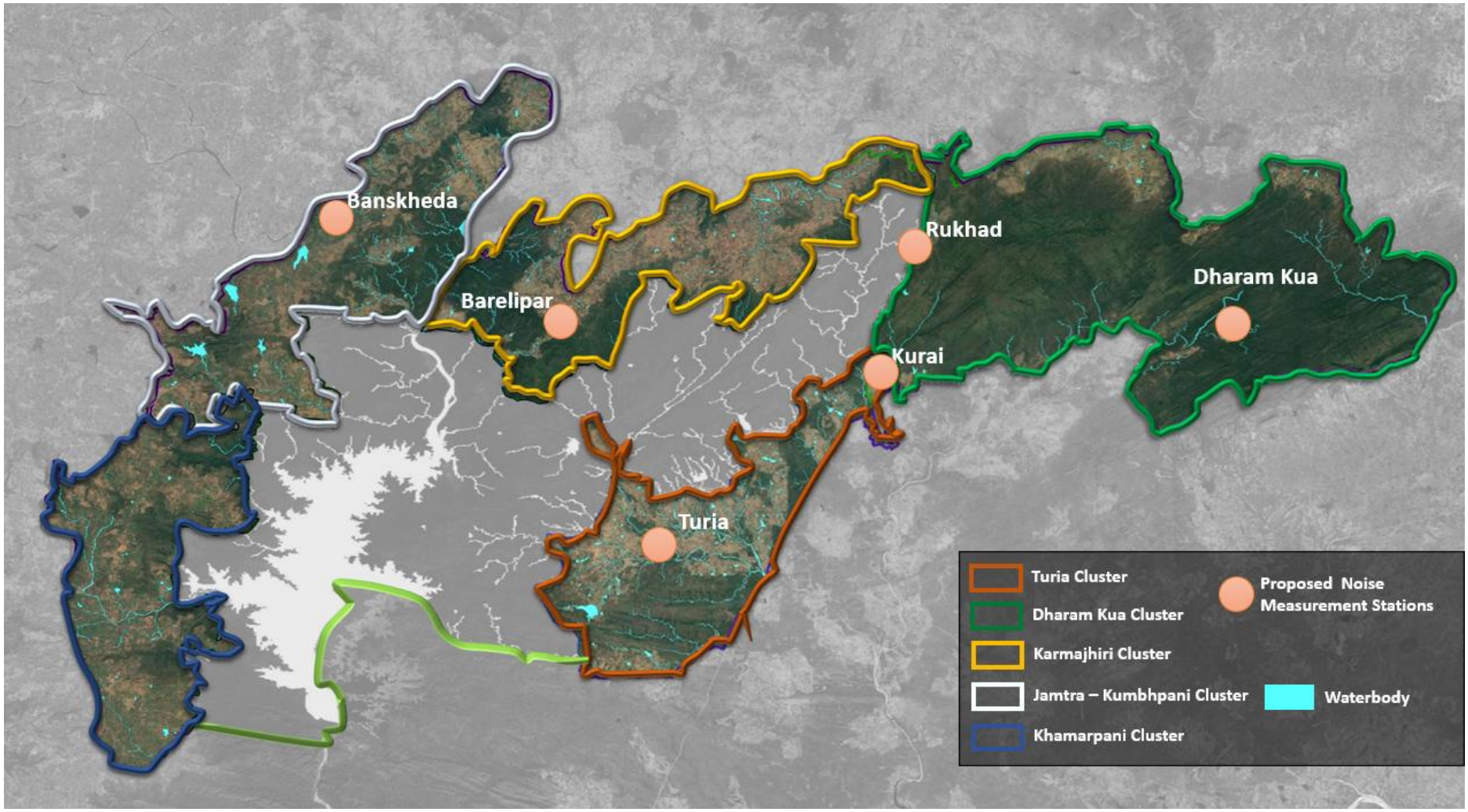


Figure 3. 37: Proposed noise measurement stations

1.2.4 LIVELIHOOD ISSUES

1.2.4.1 Stakeholder Consultation

People who will get affected by this project are the stakeholders such as investors, villagers, concerned government departents etc. Stakeholder consultation is one of the major part of planning process. Ultimately planning is to be done for the development of people who are living there or interested in that area, so it is necessary to involve them to know their expectetions, needs and perception for a perticular plan.

As a part of stakeholder consultation, the following villages have been coverd during primary survey and site visit for this project:

Table 4- 1 : Villages Visited During Primary Survey

Sr.No	Villages	Date of Survey
1	Tikari mal	18/03/2020
2	Tikari Rayat	18/03/2020
3	Karmajhiri (FV)	18/03/2020
4	Barelipar	04/10/2020
5	Salahai	04/10/2020
6	Simariya	04/10/2020
7	Sarahari	04/10/2020
8	Bhodki	04/10/2020
9	Tevni	04/10/2020
10	Ghat kohka	03/10/2020
11	Katangi	03/10/2020
12	Murer (FV)	03/10/2020
13	Panjra	03/10/2020
14	Sindaria	03/10/2020
15	Dhutera	03/10/2020
16	Mohgaon titri	04/10/2020
17	Patrai	03/10/2020
18	Niwari	04/10/2020
19	Alesur	03/10/2020
20	Agri	03/10/2020
21	Paraspani	04/10/2020
22	Raiyarao	16/03/2020
23	Pindkapar	17/03/2020
24	Kodajhir	16/03/2020
25	Setewani	16/03/2020
26	Potia	13/03/2020
27	Ambari	13/03/2020
28	Khamreeth	14/03/2020
29	Kmamba	13/03/2020
30	Vijaypani	13/03/2020
31	Jeerewara	13/03/2020
32	Mohgaon yadav	13/03/2020

Sr.No	Villages	Date of Survey
55	Magarkatha	11/03/2020
56	Pandayer	11/03/2020
57	Dulhapur (Baputola)	11/03/2020
58	Mohgaon (FV)	11/03/2020
59	Mirchhwadi	11/03/2020
60	Dharam Kua (FV)	11/03/2020
61	Kurai	13/03/2020
62	Banskheda	05/10/2020
63	Kumbhpani (FV)	05/10/2020
64	Dawajhir	05/10/2020
65	Jamtara	17/03/2020
66	Kanhasagar	18/03/2020
67	Thotamal	05/10/2020
68	Thota raiyat	05/10/2020
69	Naharjhir	08/10/2020
70	Bandhan mal	07/10/2020
71	Pathri	08/10/2020
72	Bandhan raiyat	07/10/2020
73	Gumtara	08/10/2020
74	Pathra khurd	08/10/2020
75	Khamariya	06/10/2020
76	Singardeep	19/03/2020
77	Ghargaon	06/10/2020
78	Konapindrai	18/03/2020
79	Sajpani	05/10/2020
80	Halal kala	18/03/2020
81	Halal khurd	18/03/2020
82	Madariya	05/10/2020
83	Kokiwara	05/10/2020
84	Dhoulpur	05/10/2020
85	Kharanj (FV)	05/10/2020
86	Saliwada	08/10/2020

Sr.No	Villages	Date of Survey
33	Durgapur	15/03/2020
34	Satosha	14/03/2020
35	Ambajhiri	13/03/2020
36	Telia	18/03/2020
37	Awarghani	14/03/2020
38	Kuppitola	13/03/2020
39	Nayagaon	15/03/2020
40	Mundiareeth	14/03/2020
41	Pachdhar	13/03/2020
42	Kohka	14/03/2020
43	Turia	17/03/2020
44	Arjuni	18/03/2020
45	Kothar (FV)	13/03/2020
46	Sakhadehi	11/03/2020
47	Darasi khurd	11/03/2020
48	Darasi kala	11/03/2020
49	Savangi (FV)	13/03/2020
50	Bavanthadi (FV)	13/03/2020
51	Gandatola or Rukhad	13/03/2020
52	Nayegaon (FV)	11/03/2020
53	Khapa	11/03/2020
54	Atarwani	11/03/2020

Sr.No	Villages	Date of Survey
87	Antra	08/10/2020
88	Dongargaon	07/10/2020
89	Kadhiya	07/10/2020
90	Dainy	07/10/2020
91	Marjatpur	07/10/2020
92	Pulpuldoh	07/10/2020
93	Khamarpani	07/10/2020
94	Dudhgaon	07/10/2020
95	Kanhargaon	07/10/2020
96	Devri	07/10/2020
97	Mohgaon khurd	07/10/2020
98	Sanwari	07/10/2020
99	Thuyepani	07/10/2020
100	Chirrewani	07/10/2020
101	Basanpur	07/10/2020
102	Bordi	06/10/2020
103	Sirrepani	06/10/2020
104	Pathra kala	06/10/2020
105	Kokiwara	06/10/2020
106	Kundai	07/10/2020
107	Silota kala	06/10/2020
108	Silota khurd	06/10/2020

Questionnaire has been filled for most of the villages. Also, primary data has been collected accordingly from villagers. Also, personal interviews of villagers and focused group discussions helped to understand characteristics of the villages and lifestyle of the villagers as well as economy of the villages. Focused group discussions have been fruitful to understand the issues of the villagers in detail and potential area of development in the village. It also helps to understand villager's perception regarding environmental awareness, conservation of natural resources & eco sensitive zone.

1.2.4.2 Rural Economy

There are five main pillars of economy of rural area of ESZ of Pench Tiger Reserve i.e., Agriculture, Tasar Farming, Forest, Animal husbandry & Tourism. Agriculture is predominantly major part of rural economy in India. For Pench Tiger Reserve, villages under Eco Sensitive Zone are mainly tribal villages and all the villages are near to the forest, these people are directly or indirectly dependent on forest produces & traditionally MFP are core part of economy. Also, due to dense forest area and Tiger Reserve, this region is tourist hotspot, and Turia is a major tourist attraction point throughout the year. Animal Husbandry is also one of the important components of rural economy.

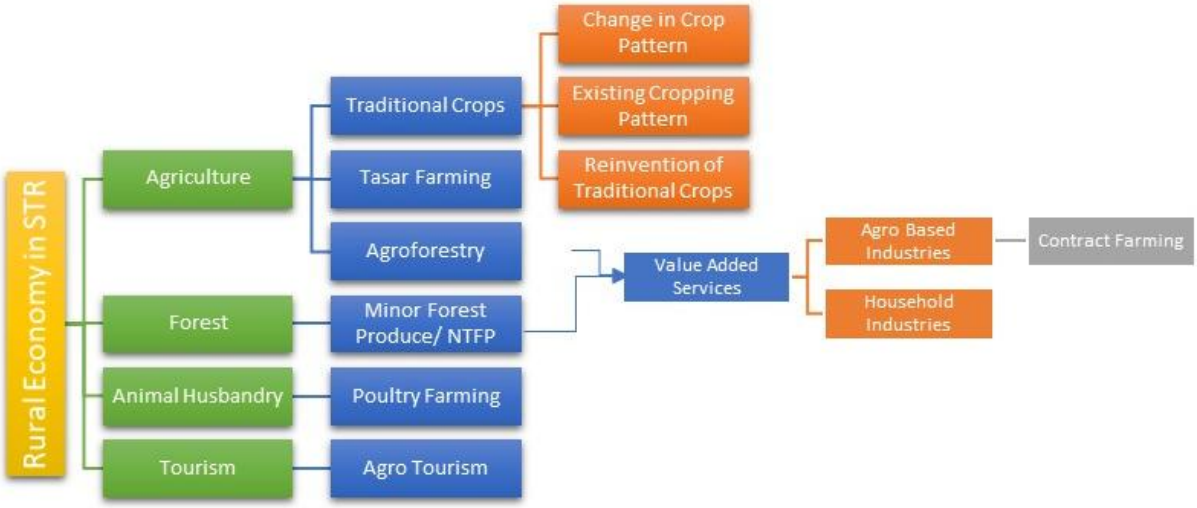


Figure 4- 1: STRENGTHENING ECONOMY OF THE VILLAGES

1.2.4.3 Promotion of Eco-Development Activities

Agriculture, along with its allied sectors, is the primary livelihood provider in India, especially in rural areas, contributing significantly to the GDP. Sustainable agricultural practices, such as soil conservation, resource management, and biodiversity protection, are crucial for rural development.

The Pench Tiger Reserve (PTR), traversed by the Pench River, is rich in agricultural land with shallow and deep black soils. The region's major crops include paddy, maize, and soybean. Historically, Kodo and Kutki millets were staple crops in the villages of the Eco Sensitive Zone (ESZ) of PTR, grown by the Gond and Baiga tribes.

Traditional crops like Kodo and Kutki are indigenous to the region and have become part of the local culture. Mountain communities, relying on slash-and-burn agriculture and hunting, are increasingly adopting traditional ecological knowledge to improve sustainability. These practices support both cultural and biological diversity, making the region attractive to tourists.

Traditional Crop of the region

Minor millets are most important traditional crop in the tribal area of Madhya Pradesh. This crop is linked with the tribal life and its social, culture and health practices. The minor millets are very rich in nutrition as can be seen from the accompanying comparison chart. Tribal know the value of minor millets and they still feel this is very important food crop for them to protect and fight against so many diseases.

Minor millets have huge nutritional power especially for the women at the time of pregnancy. Minor millet is deeply related to culture and sustainable agricultural practices of tribal communities. The tribal communities use minor millets for both foods for themselves and feed for their animals.

In the villagers of the Eco sensitive zone belongs to Gond and Baiga tribes the traditional food of this tribe is Kodo and Kutki millets. These Millets are the staple food of the tribes from thousands of years.

- **KODO MILLET**

Kodo millet (*Paspalum scrobiculatum*) is a small, seeded cereal grain and is among one of the oldest cultivated crops in India. This crop can be easily cultivated on the stony or gravelly soils which would not support other crops. This crop keeps the soil moisturized to a greater extent and thus is a good source of drought resistance. It is an annual tufted grass that grows up to 90 cm high. The grain is enclosed in hard, corneous, persistent husks that are difficult to remove. The grain may vary in colour from light red to dark grey. As compared to other crops it takes more time for cultivation of Kodo Millets.

- **KUTKI MILLET**

Little (Kutki) Millet: Little millet matures quickly and withstands both drought and water logging. Less genetic diversity occurs in the world collections of this species than appears among the other species and the grains are similar to that of rice.

Promotion of Organic farming, encouragement to increase traditional crops production, use of biofertilizers and agro forestry can lead to develop agritourism in the region. Development or minor change in agriculture sector can generate a side income to the local communities as well as it will lead to better agricultural practice.

Organic Farming

The most widely acceptable definition of organic farming is "Organic is a production system that sustains the health of soils, ecosystem and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved".[1]

Organic farming systems do not use toxic agrochemical inputs (pesticides, fungicides, herbicides and fertilizers). Instead, they are based on development of biological diversity and the maintenance and replenishment of soil productivity.

Importance of organic farming in India:

Organic farming is gaining gradual momentum across the world. Growing awareness of health and environmental issues in agriculture has demanded production of organic food which is emerging as an attractive source of rural income generation. Organic agriculture has made a credible performance during the past ten years. Both, the 11th plan document on organic sector and the report of the National Commission on farmers have recommended it as a tool for second green revolution in the country in particular for Agro- eco zones comprising rain fed areas, hilly areas and areas experiencing ecological backlash of green revolution. Organic agriculture can become low cost, sustainable option of farming in the country, particularly by the small farmers in rain fed areas and helps to improve their food and income security. It helps to produce and supply adequate safe and nutritious food to the producers and consumers of the nation. Environmental benefits, health aspects and farmers empowerment are other important factors influencing farmers to shift to organic agriculture. Some of the important benefits of organic farming are Organic fertilizers are completely safe and does not produces harmful chemical compounds.[5]

Government Schemes for Agriculture sector:[6]

Government has launched various schemes for agriculture sector in order to facilitate the farmers with latest techniques, awareness regarding agriculture crop production, promotion of organic farming etc. List of government schemes are as below:

National Level Schemes

- Mission for Integrated Development of Horticulture Schemes
- National Mission for Sustainable Agriculture
- National Mission on Oilseeds and Oil Palm
- Rashtriya Krishi Vikas Yojana
- Pradhan Mantri Krishi Sinchayee Yojana
- Rainfed Area Development Programme
- Small Farmer's Agri-Business Consortium Scheme
- Integrated Scheme for Agricultural Marketing
- Integrated Scheme of Agriculture Census, Economics and Statistics
- Venture Capital Assistance Scheme for farmers
- Soil Health Card Scheme
- National Livestock Mission
- Livestock Health & Disease Control Scheme
- Fodder Development Programme
- Rashtriya Gokul Mission

[5] EUROPEAN ACADEMIC RESEARCH Vol. III, Issue 4/ July 2015; Present Status and Prospects of Organic Farming in India by Dr. M.S.Deshmukh & Nitin Babar

[6] http://mpkrishi.mp.gov.in/hindisite_New/suvidhaye_New.aspx

- National Programme for Bovine Breeding
- Dairy Entrepreneurship Development Scheme
- Ration Balancing Programme
- National Food Security Mission
- Mega Food Parks Scheme
- Cold Chain Scheme
- Prime Minister Crop Insurance Scheme
- Weather Based Crop Insurance Scheme
- Under NABARD)
- Unified Package Insurance Scheme
- Schemes under National Horticulture Board
- Capital Investment Subsidy Scheme for Commercial Production Units for organic/ biological Inputs (Under NABARD)
- Agriclinic and Agribusiness Centres Scheme (Under NABARD)[7]
- National Livestock Mission

M P State Level Schemes

- State Sector Schemes
- State Micro Irrigation Mission
- Balram Taal Yojana
- Mukhya Mantri Krishi Teerth Yojana
- Krishi-Net Pariyojana
- Kisan Mitra Prashikshan Yojana
- Soil Testing Yojana
- Annapurna aur Surajdhara Yojana
- Schemes under Department of Animal Husbandry
- Nandishala Yojana

7 https://www.nabard.org/content1.aspx?id=595&catid=23&mid=530

For successful implementation of the schemes, existing structure of Department of Agriculture and tribal welfare is shown below:

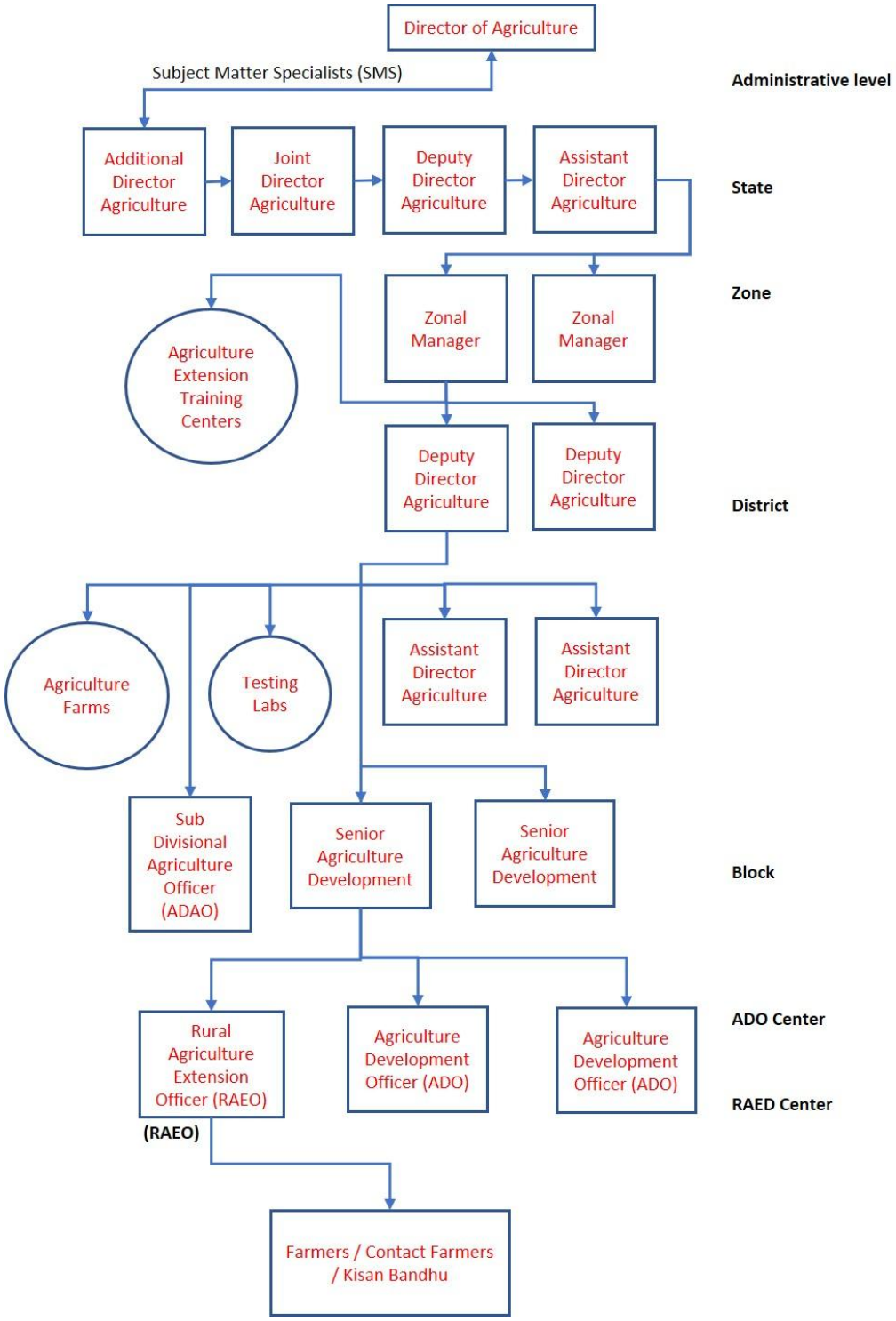


Figure 4- 2: Existing structure of Department of Agriculture and tribal welfare is shown

Proposed Rural Tourism in Pench Tiger Reserve is provided on cluster wise basis. Each cluster is proposed with the rural tourism village, which needs to be developed as Model village also. The model villages can be consisted for attracting tourism in rural areas, promote agro-rural-tourism in the region and generate the revenue for the villagers apart from the agriculture. These villages are proposed based on availability of agriculture, availability of haat bazar in nearer areas, type of agriculture present, awareness for tourists

and welcoming nature of local villagers. A warehouse and interpretation centers to be proposed in these villages, which will be helpful to provide the basic knowledge for the agricultural process and seeds and the crops. Various food products can be served to the tourists made from Kodo and Kutki millets that will enhance their experience. Apart from that, promotion of organic crops one information center should be developed to increase awareness in local people as well as to tourists.
The villages proposed for the same are Dongergaon, Kumbhpani, Ghatkohka, Rukhad, Dharam Kua and Pachhdhar.

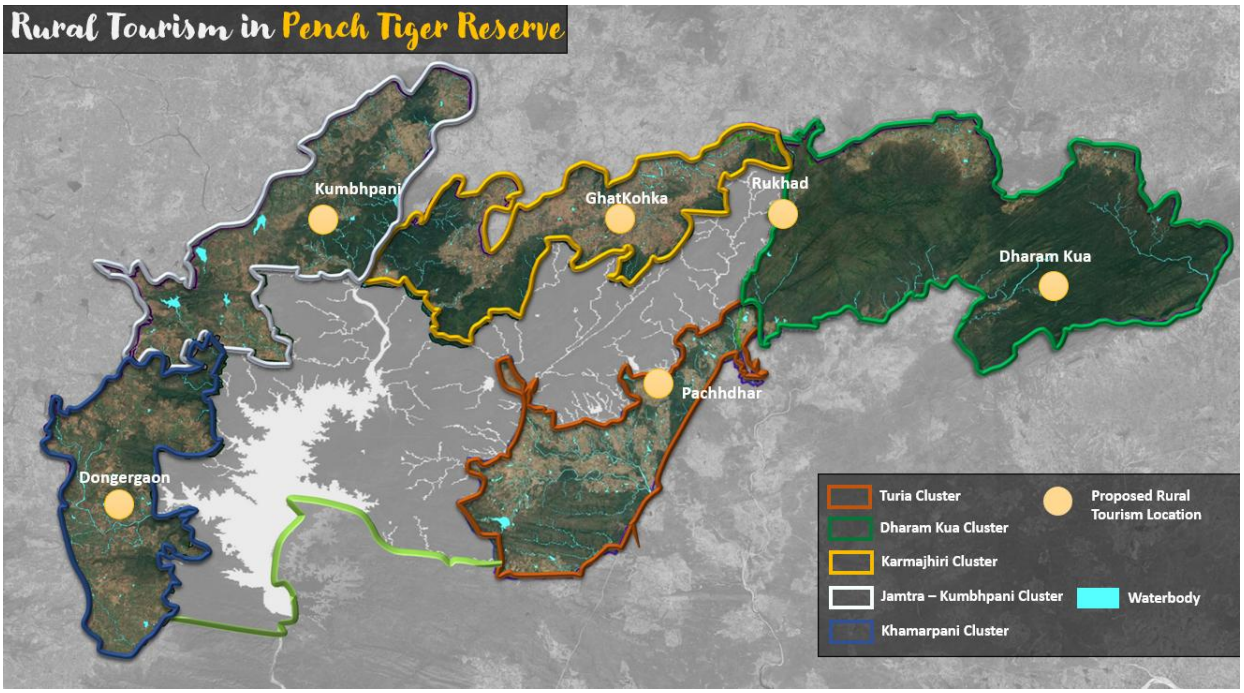


Figure 4- 3: Proposed Model villages for ESZ

By developing these notified villages as model village for organic agriculture and cultivation of little millets, other villages of the ESZ can be developed in future.

1.2.4.3.1 Honeybee Farming / Apiculture

Beekeeping or Apiculture is the process of maintaining of Bee colonies or hives so that Honey or other commercial products can be harvested from them. Apiculture is also practiced as a part of agriculture all over India for many years. This is because, maintaining a beehive does not require a huge amount of money or labor. It does not even require a fertile land. Plus it gives many benefits to farmers as many plants and crops depends on bees for pollination. Honey and other products of a bee farm like Beeswax, Royal Jelly, Bee Venom are of commercial value and can provide additional income to farmers.
Beekeeping is important for securing food, poverty reduction, health, environmental protection and plant pollination. These important practices are challenged by many biotic and abiotic factors in recent years. These factors affect honeybees and their valuable products either in combination or alone. The climatic factors like extreme temperature, relative humidity, shortage of water, deforestation of floral plants, human factors like poor apicultural practices, synthetic pesticides, diseases, and arthropod pests led to the decline of honeybee colonies and their products. But the world market demand for honey and other hive products has increased tremendously in recent decades since it is important for a wide variety of uses and applications.

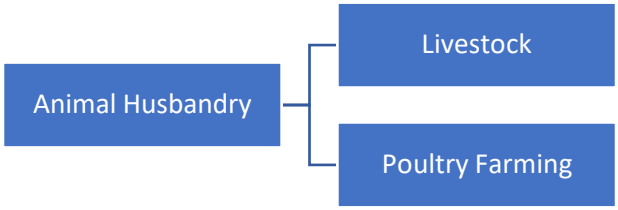
1.2.4.3.2 Agro Forestry

Agroforestry is defined as “a land use system which integrate trees and shrubs on farmlands and rural landscapes to enhance productivity, profitability, diversity and ecosystem sustainability. It is dynamically ecologically based, natural resource management system that, through woody perennials on farms and in the agriculture landscape, diversifies and sustains production and builds social institutions.” (National Agroforestry Policy, 2014)

Agroforestry systems include both traditions and modern land-use systems where trees are managed together with crops and or/ animal production system in agricultural settings. Agroforestry is practiced in both irrigated and rain fed conditions where it produces food, fuel, fodder timber, fertilizer and fiver, contributes to food, nutritional and ecological security, sustains livelihoods, alleviates poverty and promotes productive and resilient cropping and farming environments. Agroforestry also has the potential to forests, and far greater than the crop and grass system.

1.2.4.3.3 Animal Husbandry

Animal husbandry is major part of rural life and rural economy. Animal Husbandry includes livestock and poultry farming. Most of the villagers have livestock. Most of them are having cows and goats. From primary survey it has come to know that very few farmers have buffalo as compared to number of cows. Economically livestock is important because of milk production. But there is wild cows in this region which normally produces 2 to 3 liters milk per day which is very low in terms of commercial selling in dairy. Due to this limitation in livestock, it is more beneficial for villagers to developing poultry farming.



Poultry Farming:

Poultry farming involves raising chickens, turkeys, ducks, and geese for meat and eggs. The OECD-FAO Agricultural Outlook (2008-2017) predicts India's poultry product demand will grow by 4.8% annually, with a 5.2% increase in output. In rural areas, backyard poultry mainly consists of low-producing Desi chickens, contributing 11% of India's egg production. The Rural Backyard Poultry Development initiative, launched by the Indian government, supports Below Poverty Line (BPL) families by providing income and nutritional benefits. Since 2009-10, it has benefited around 6.13 lakh BPL families. Poultry farming has become a key sector, with programs aimed at increasing egg and poultry meat production through improved chick availability, feed, healthcare, and storage. It is also seen as an important poverty alleviation tool, offering support to small farmers and agricultural laborers.

Establishment of Number of Poultry estates in collaboration with government-initiated agency, such as the National Rural Livelihood Mission (NRLM), National Cooperative Development Corporation (NCDC) and the National Bank of Agriculture and Rural Development (NABARD), state governments and non-government organizations (NGOs).
Funding several research activities related to poultry breeding and health management. This included setting up various regional poultry breeding farms, introduction of Intensive Poultry Development Projects (IPDP), and setting up a Central Training Institute for Poultry Production and Management (CTIPPM) in Bangalore.
Similar trend of poultry development was observed in the villages of ESZ of STR, proposing backyard poultry farming in the cluster will be another way of livelihood of the villagers. Also, regarding this program, theirs is very little awareness among rural people which can be dealt with the help of Self-help groups and NGOs.

Backyard poultry makes significant contribution to livestock economy. Advancement of the rural backyard poultry sector can definitely contribute to poverty alleviation and nutritional improvement.

Promoting Sukhtawa and Kadaknath chicken farming in villages of PTR should be a priority. Kadaknath, known for its black meat and health benefits, is adapted to harsh climates and poor conditions. Native to Madhya Pradesh, Gujarat, and Rajasthan, the breed is valued for its unique characteristics, including its low fat content (0.70 to 1.05%) compared to other chickens. However, its population has declined due to high demand and limited commercial farming.
Raising awareness through local resources, like MPSRLM-promoted CRPs/Pashu sakhis, can help educate rural communities. Key challenges include low productivity, high mortality, poor veterinary care, and inadequate housing. Addressing these issues with local feed resources, ethno-veterinary medicine, and better farmer education can improve backyard poultry production.
Additionally, linking backyard poultry with contract farming can benefit farmers by providing price insurance and incentives. In this model, farmers supply labor and land, receiving a guaranteed price set by poultry companies, reducing the risk of market fluctuations

1.2.4.4 Tourism Based Economy

Pench Tiger Reserve is highly dependent on agriculture and tourism activities The tourism attraction towards protected zone is much higher than the Buffer zone of Tiger Reserve. Proposed tourism in buffer zone will provide employment to the local people as well as also provides business opportunity to locals. The below graph represents the economy of Tiger Reserve and its impact on local livelihood.

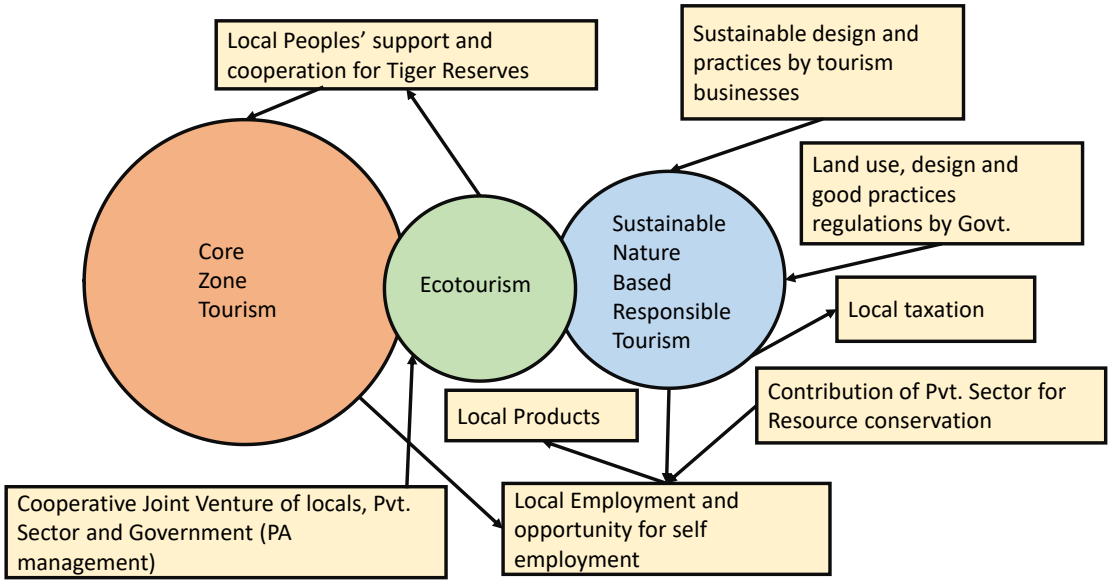


Figure 4- 4 : Tourism Based Economy in PTR

As the tourism increases in the buffer zone, there will be high consumptions of local produces, required accommodations and many other things. These will increase the opportunities for local employment and the tax benefits to the local authority. This will lead to upliftment of living standards of the community and region will be self-sustain. The linkages of economy with various parameters are as below chart.

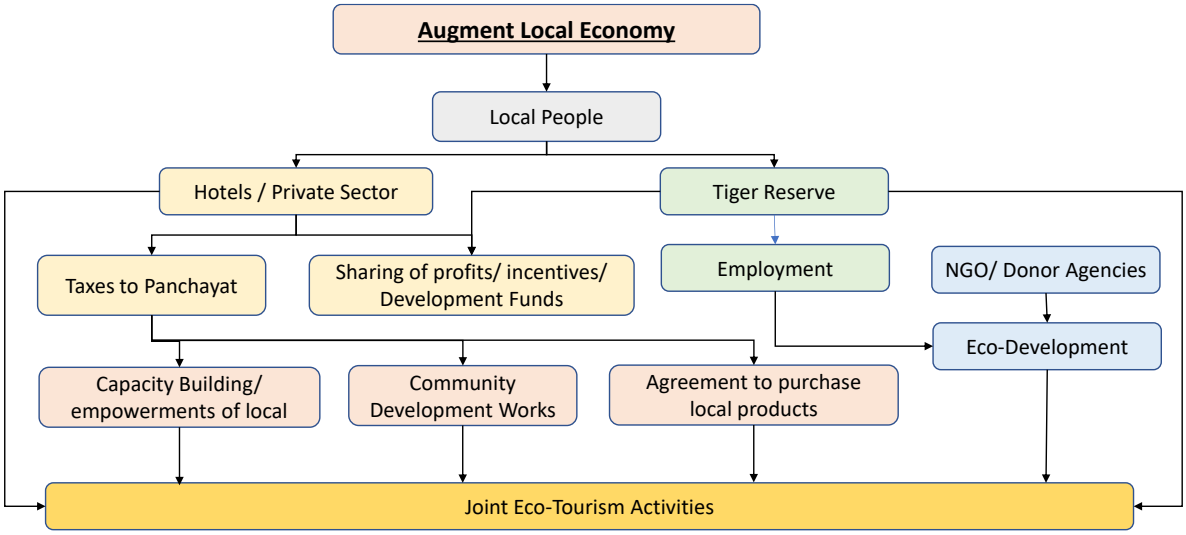


Figure 4- 5 : Linkages of Economy with tourism activities

The private sector needs to share their profits/ incentives apart from providing employment to the locals. By doing so, the community-based development work like education, health and many more will get suffice funds. On other hand, tiger reserve and the NGOs will do the groundwork to develop these infrastructure and facilities. The NGOs, Tiger Reserve and Private sector jointly can do the joint ventures for the eco-tourism and generate the fund for welfare of the society.

1.2.4.5 Agro-Industries

Agro-based industries are those industries which have either direct / indirect link with agriculture. Industries which are based on agricultural produce and industries which support agriculture come under agro-based industries.

Importance of Agro-industries

- Establishment of agro-based industries is based on the availability of raw material.
- Agro-based industries have to set up at rural areas where raw material may be available in plenty – helps in the up-liftmen of the rural economy.
- Provide rural population an opportunity for employment.
- Generate income and thereby improve economic condition of people – which in turn creates potential for demand-based industries.
- Provide an opportunity for the dispersal of industries instead of concentrating at a particular place.
- Solve the problem of exploitation of farming community by traders and middlemen.
- Farmers could be assured of better price for their produce.
- Encourage to bring more and more areas under various crops – increase agricultural production and improve nation's economy.
- Transportation cost of agricultural products can be minimized – thereby help to minimize cost of finished goods.
- Avoid wastage of perishable agricultural products.
- Help to develop backward areas based on their suitability for setting up agro-industries.
- Prevent migration of people from rural to urban areas.

Industries are divided into four groups.

- Resource based
- Demand based
- Skill based
- Ancillary

Also, Again the resource-based industries are divided into agro-based, forest based, animal husbandry and poultry based, mineral based, marine based, etc.

As the region is declared as eco sensitive zone, as per notification of ESZ, mineral based industries are prohibited in the zone. Also, the region is in landlocked area, marine based industries have no scope in the region.

TYPES OF AGRO-BASED INDUSTRIES

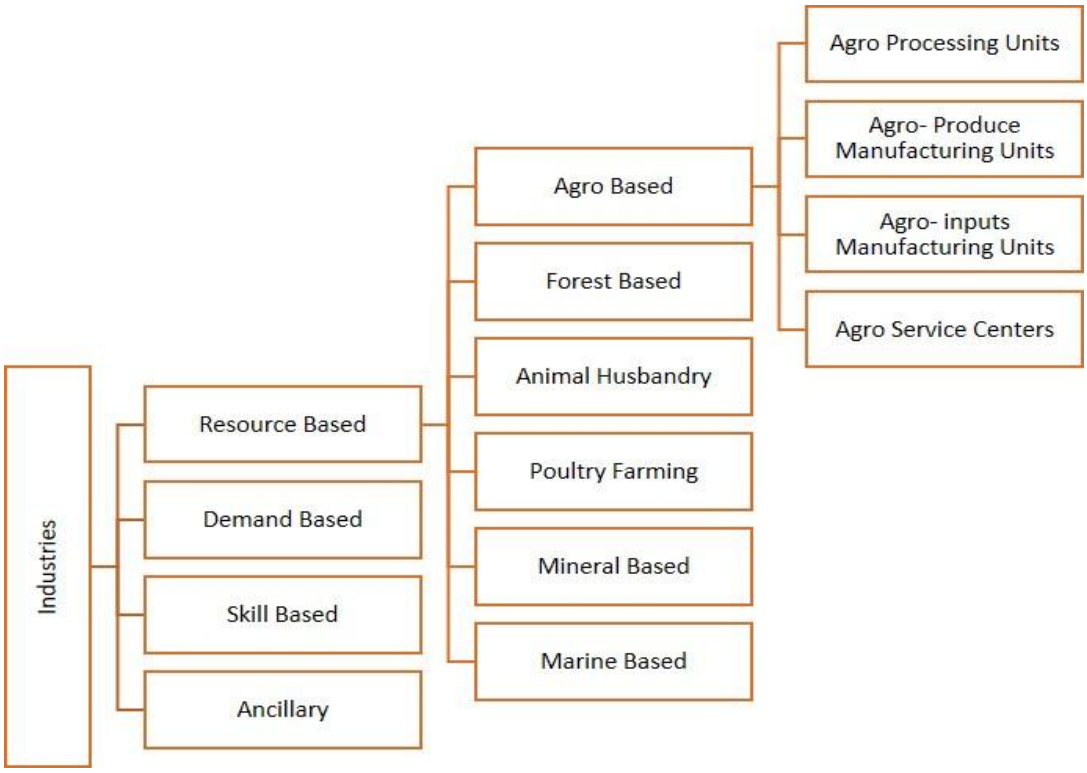


Figure 4- 6 :Types of Agro-Based Industries

There are four types of agro-based industries.

1. Agro-produce processing units
- They merely process the raw material so that it can be preserved and transported at cheaper cost. No new product is manufactured. Ex: Rice mills, Dal mills, etc.

2. Agro-produce manufacturing units
- Manufacture entirely new products. Finished goods will be entirely different from its original raw material. Ex: Sugar factories, bakery, solvent extraction units, textile mills, etc.

3. Agro-inputs manufacturing units
- Industrial units which produce goods either for mechanization of agriculture or for increasing productivity come under this type. Ex: Agricultural implements, seed industries, pumpset, fertilizer and pesticide units, etc.

4. Agro service centres
- Agro service centres are workshops and service centres which are engaged in repairing and servicing of pumpsets, diesel engines, tractors and all types of farm equipment.

NEED FOR AGRO-BASED INDUSTRIES

- Suitable to rural areas as they are raw material oriented.
- For upliftment of rural economy.
- To solve the problem of unemployment.
- To generate income and increase standard of living.

- For decentralization and dispersal of industries.
- To reduce disparity between rural and urban areas.
- To encourage balanced growth between agriculture and industry.
- To solve the problem of exploitation of farming community.
- To reduce transportation costs.
- To give big push to agriculture and act as a source of demand and supply.
- To avoid wastage of perishable agricultural products.
- To prevent migration of rural people.
- To develop suitable backward areas.
- To improve infrastructural facilities.

1.2.4.6 Household industries through SHGs:

The case studies indicate that the public sector and NGOs as well as private entrepreneurs play an important facilitating role in developing linkages between agro-industry and farmers. This role may include organizing farmers or assisting NGOs or private enterprises to take on responsibilities previously discharged by states, providing credit, assisting with inputs, providing information on technology and ensuring that contract requirements are met. In this way, the public sector, NGOs, and private entrepreneurs are helping directly to create beneficial linkages between agro-industry and farmers, and indirectly creating other linkages between the farm and non-farm sectors.

Household Industries/ Cottage Industries

Household industries are mostly dependent on availability of raw material or resources. Household industries are one of the most important part of resource-based industries. Area of Eco Sensitive Zone of Pench Tiger Reserve has a tremendous potential to develop household industries. As mentioned in above topics, there are number of forest products, agricultural products available in the region. Using that as a raw material, household industries can be develop that can generate employment in rural area and will generate side income for community. There are some government schemes and programs are going on for promotion of household industries in rural area and specially for tribal communities.

Household industries through SHGs:

Under National Rural Livelihood Mission and State Rural Livelihood Mission, SHGs have been formulated in villages. NRLM and SRLM both can promote household industries in collaboration with NGOs and other private sectors for packaging, manufacturing and other type of industries. In addition, NGOs and other private sectors can provide training and resources through SRLM centres under super vision of Block managers of RLM centers.

Deendayal Upadhyay Grameen Kaushal Yojana (DUGKY)

Department: Ministry of Rural Development

Salient features:

- To expand the scope of livelihood opportunities to the rural poor.
- To promote entrepreneurship under the categories of micro and cottage industries in the villages.
- To discourage distress migration of rural people to urban centres in search of jobs.

Recommendations:

- Avenues of Secondary Agriculture form an important vehicle in achieving the objectives of DUGKY. Hence, this category be made a special mention under the Scheme Guidelines that will enable ailment of funds based on submission of domain specific proposals.

Small Farmers' Agri-Business Consortium (SFAC)

Department: Department of Agriculture, Cooperation and Farmers Welfare (Ministry of Agriculture & Farmers Welfare)

Salient features:

- To link the small farmers to agricultural value chain which includes investments, technology and markets in association with private, corporate or cooperative sector

Recommendations:

- Avenues of Secondary Agriculture be recognized as a domain of special emphasis and separate provision be made in the budget (and mention in the Guidelines) to promote the same

Deendayal Upadhyay Swaniyojan Yojana (DUSY)

Department: Ministry of Rural Development

Salient features:

- To provide skill sets for self-employment to rural masses
- To give incentives to rural poor pursuing self-employment
- To provide financial assistance to self-employed or poor rural entrepreneurs
- To support poor rural people desirous of starting new business or pursuing self-employment options

Recommendations:

Separate, proportion-based allocations should be made for 'Secondary Agriculture' under DUSY, as it has significant potential for rural self-employment. Agro-tourism plays a key role in promoting activities like organic farming, agro-forestry, and agro-industries. It offers a platform for villagers to showcase their produce and work to local, national, and international visitors. Agro-tourism helps promote rural activities, raising awareness among both visitors and locals, especially the younger urban population.

1.2.4.7 Agro-Based Tourism

Agro tourism is a great platform for linking the economic activities in the region.

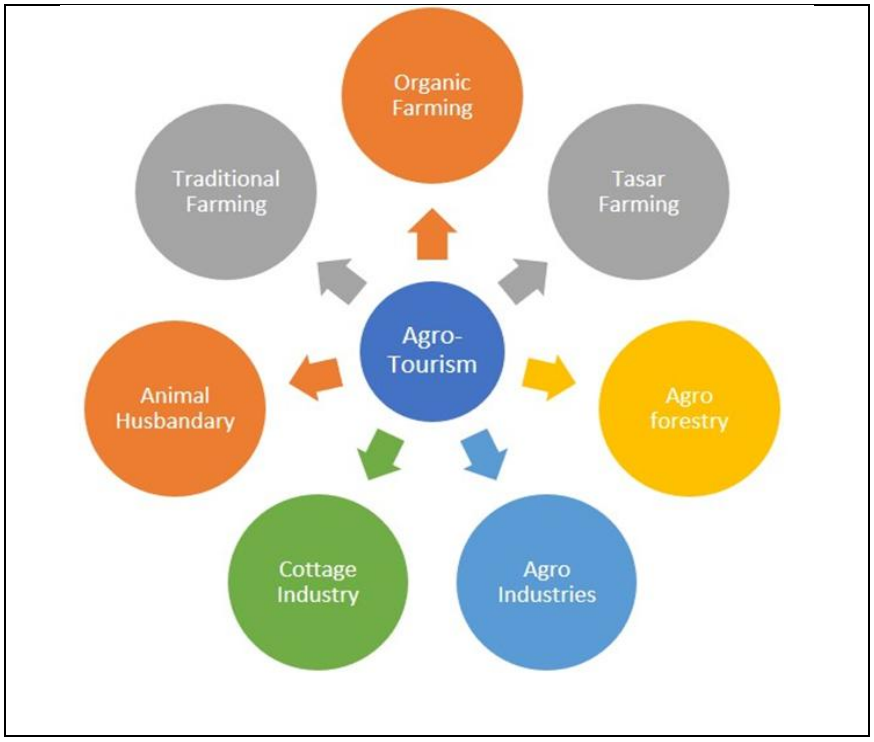


Figure 4- 7: Agro tourism as a platform for linking the economic activities in the region

Agro- Based tourism or agro tourism or agri tourism is an activity that links the economic, social and environmental components of sustainability, strongly related to local communities and their attitudes towards tourism. It can support new directions in rural sustainable development, with specific effects on the environment, agricultural heritage, or economic growth.

Agro- Based tourism or agro tourism or agri tourism is an activity that links the economic, social and environmental components of sustainability, strongly related to local communities and their attitudes towards tourism. It can support new directions in rural sustainable development, with specific effects on the environment, agricultural heritage, or economic growth.

Agro-based tourism is often defined as part of the Ecotourism for both are related and subject to natural attractions. Both are described as forms with a rapid development of tourism. These forms are more marked in developed countries, conducting as models of potential development of natural resources and economic support of local society.

The sustainability of agro based tourism on the "health" of rural environment derives from the fact that this activity cannot be dissociated from the economic, social and cultural life of the community. Between tourism and environment there is a close relationship based on:

- The environmental elements considered to be tourist attractions.
- Facilities and tourism infrastructure.
- The impacts generated by tourism development and tourist use on the environment and settlements.

Agro based tourism implies the existence of two main activities: agricultural and tourism activities, which assume three elements specific to any tourist product with some particularities in this case: accommodation, food and entertainment

- The first element of the agro-based tourism product is accommodation. The farmer has the possibility to obtain additional income from renting the surplus of rooms existing in the farm. The agro-based tourism accommodation service is thus intertwined with the main activity of the farmer (agriculture), but without interfering with it.
- The second element of the agro-based tourism product is food. Through food, the farmer has the possibility of direct capitalization of agricultural production, being a direct relationship between the person who offers the services (the farmer and his family) and the one who requests them (the tourist). Another peculiarity of food in agro-based tourism is the fact that it is based on the traditional cuisine of the place and prepared with products from their own household, or from the area/region, thus supporting both the agro-based tourism farm and the area it is part of.
- The third element of the agro-based tourism product is tourist entertainment. In the case of agro-based tourism, the tourist entertainment is based on traditional activities in the farm or household where the tourist can actively or passively participate.

In rural areas, farmers often engage in multiple sectors to diversify income, as agricultural earnings alone may be insufficient. Increasing demand for tourism has become a significant source of income, with agro-tourism growing rapidly as tourists seek unique experiences. Agro-tourism combines agricultural activities with tourism, offering new opportunities for farmers to enhance their income and improve their quality of life.

Agro-tourism educates the public about agriculture, boosts local economies, reduces urbanization by creating jobs, and promotes local products through direct marketing. It also stimulates economic activity and contributes to rural development by increasing revenue, creating jobs, fostering exchanges between rural and urban areas, and improving local infrastructure.

While rural tourism is a broad concept, agro-tourism specifically involves leisure activities organized by farmers for visitors. Despite its benefits, agro-tourism can have negative impacts, such as environmental degradation and loss of cultural identity, if not developed ethically. Therefore, it is essential to balance growth with the preservation of local values and ecosystems

SCOPE OF AGRO - TOURISM

Agro-Tourism has great scope in the present context for the following reasons:

1. **An inexpensive gateway** - The cost of food, accommodation, recreation and travel is least in Agri-Tourism. This widens the tourist base. Present concept of travel and tourism is limited to urban and rich class which constitutes only a small portion of the population. However, the concept of Agri-Tourism takes travel and tourism to the larger population, widening the scope of tourism due to its cost effectiveness.
2. **Curiosity about the farming industry and lifestyle -** The urban population having roots in villages always have had the curiosity to learn about sources of food, plants, animals, raw materials like wood, handicrafts, languages, culture, tradition, dresses and rural lifestyle. Agri-Tourism which revolves around farmers, villages and agriculture has the capacity to satisfy the curiosity of this segment of population.
3. **Strong demand for wholesome family oriented recreational activities** - Villages provide recreational opportunities to all age groups i.e. children young, middle and old age, male, female, in total to the whole family at a cheaper cost. Rural games, festivals, food, dress and the nature provide variety of entertainment to the entire family.

4. **Health consciousness of urban population and finding solace with nature friendly means** - Modern lifestyle has made life stressful and average life span has come down. Hence, people are in constant search of pro-nature means to make life more peaceful. Ayurveda which is a pro-nature medical approach has roots in villages. Indigenous medical knowledge of villagers is respected. Organic foods are in greater demand in urban areas and foreign countries. In total, health conscious urban population is looking towards pro- nature villages for solutions.
5. **Desire for peace and tranquility** - Modern life is a product of diversified thinking and diversified activities. Every individual attempt to work more, in different directions to earn more money to enjoy modern comforts. Hence, peace is always out of his system. Tourism is a means for searching peaceful location. Peace and tranquility are inbuilt in Agri-Tourism as it is away from urban areas and close to nature.
6. **Interest in natural environment** - Busy urban population is leaning towards nature. Because, natural environment is always away from busy life. Birds, animals, crops, mountains, water bodies, villages provide totally different atmosphere to urban population in which they can forget their busy urban life.
7. **Disillusionment with overcrowded resorts and cities** - In resorts and cities, overcrowded peace seekers disturb each other's peace. Hence, peace is beyond cities and resorts. Even though efforts are made to create village atmosphere in the sub urban areas through resorts, farmhouses, it looks like a distant replica of the original.
8. **Nostalgia for their roots on the farm** - Cities are growing at the cost of villages. Villagers are migrating to cities in search of jobs and to seek the comforts of modern life. Hence, yesterday's villagers are today's urbanites. Deep in the heart of urbanites lies the love and respect for their ancestors and villages. Hence, visit to villages satisfies their desire. This is also expressed through the hatred of urbanites to flat culture and love for farmhouses located in the outskirts of cities. Any opportunity to visit villages and spend time with family is dream of any urbanite. But minimum decent facilities are always problem. Agri-Tourism attempts to overcome this problem.
9. **Rural recreation** - Villages provide variety of recreation to urbanites through festivals and handicrafts. Villagers (farmers) lifestyle, dress, languages, culture / traditions which always add value to the entertainment. Agricultural environment around farmers and the entire production process could create curiosity among urban taught. Places of agricultural importance like highest crop yielding farm, highest animal yielding farm, processing units, farms where innovations tried adding attraction to the tourists. Agricultural products like farm gate fresh market, processed foods, organic food could lure the urban tourists. As result of this agri – atmosphere in the villages, there is scope to develop Agri – Tourism products like agri-shopping, culinary tourism, pick and own your tree / plot, bed and breakfast, pick and pay, bullock cart riding, camel riding, boating, fishing, herbal walk, rural games and health (ayurvedic) tourism.
10. **Educational value of Agri-Tourism** – Agri-Tourism could create awareness about rural life and knowledge about agriculture science among urban school children. It provides a best alternative for school picnics which are urban based. It provides opportunity for hands on experience for urban college students in agriculture. It is a means for providing training to future farmers. It would be effectively used as educational and training tool to train agriculture and line department officers. This provides unique opportunity for education through recreation where learning is fun effective and easy. Seeing is believing, doing is learning. This experience-based concept is the USP of Agri-Tourism.

1.2.5 ECOTOURISM, INTERPRETATIONAND CONSERVATION EDUCATIONSUB-ZONAL TOURISM MASTER PLAN

1.2.5.1 EXISTING TOURISM FACILITIES AND ASSETS OF MPTB

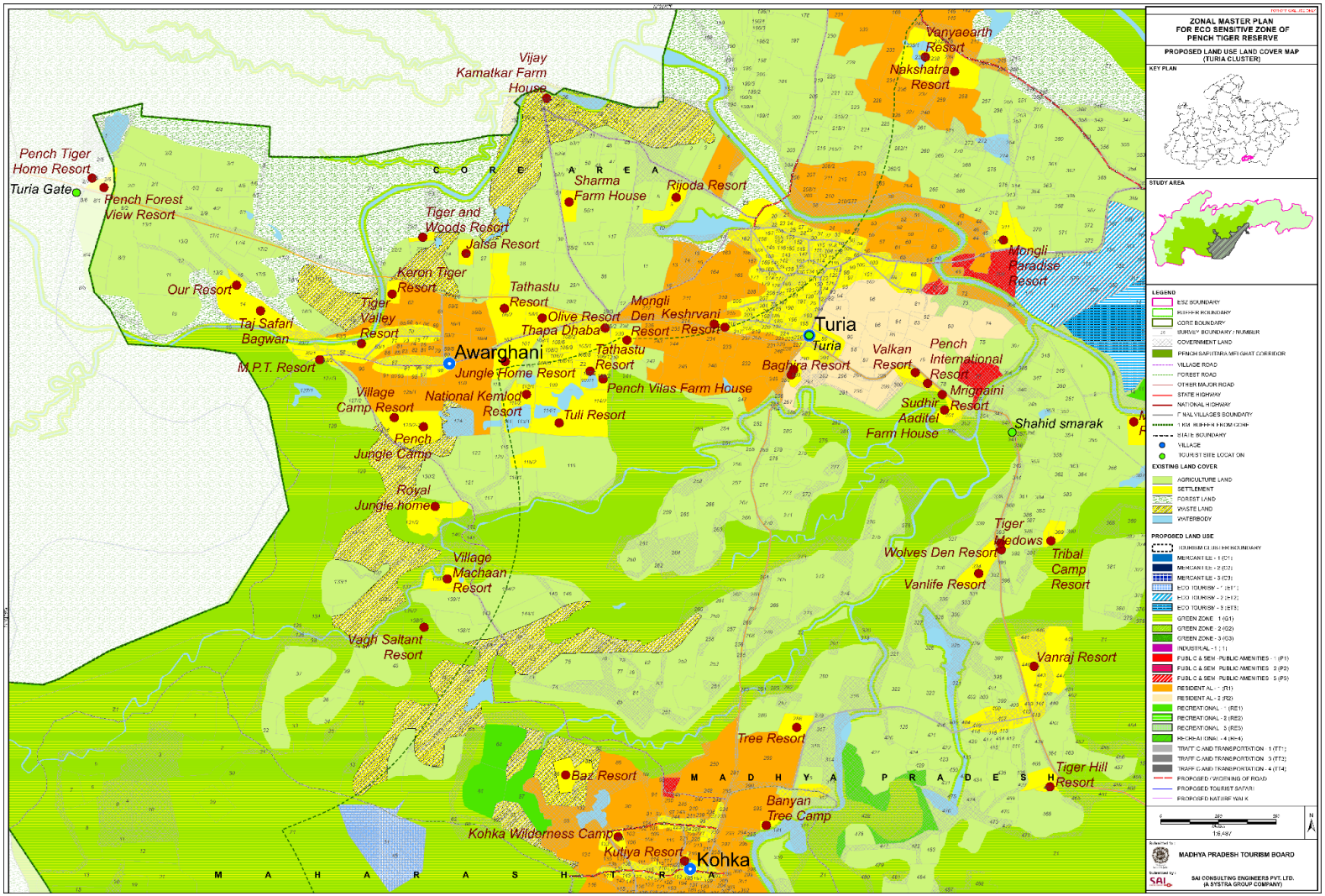


Figure 5- 1: Existing Accommodation Facilities

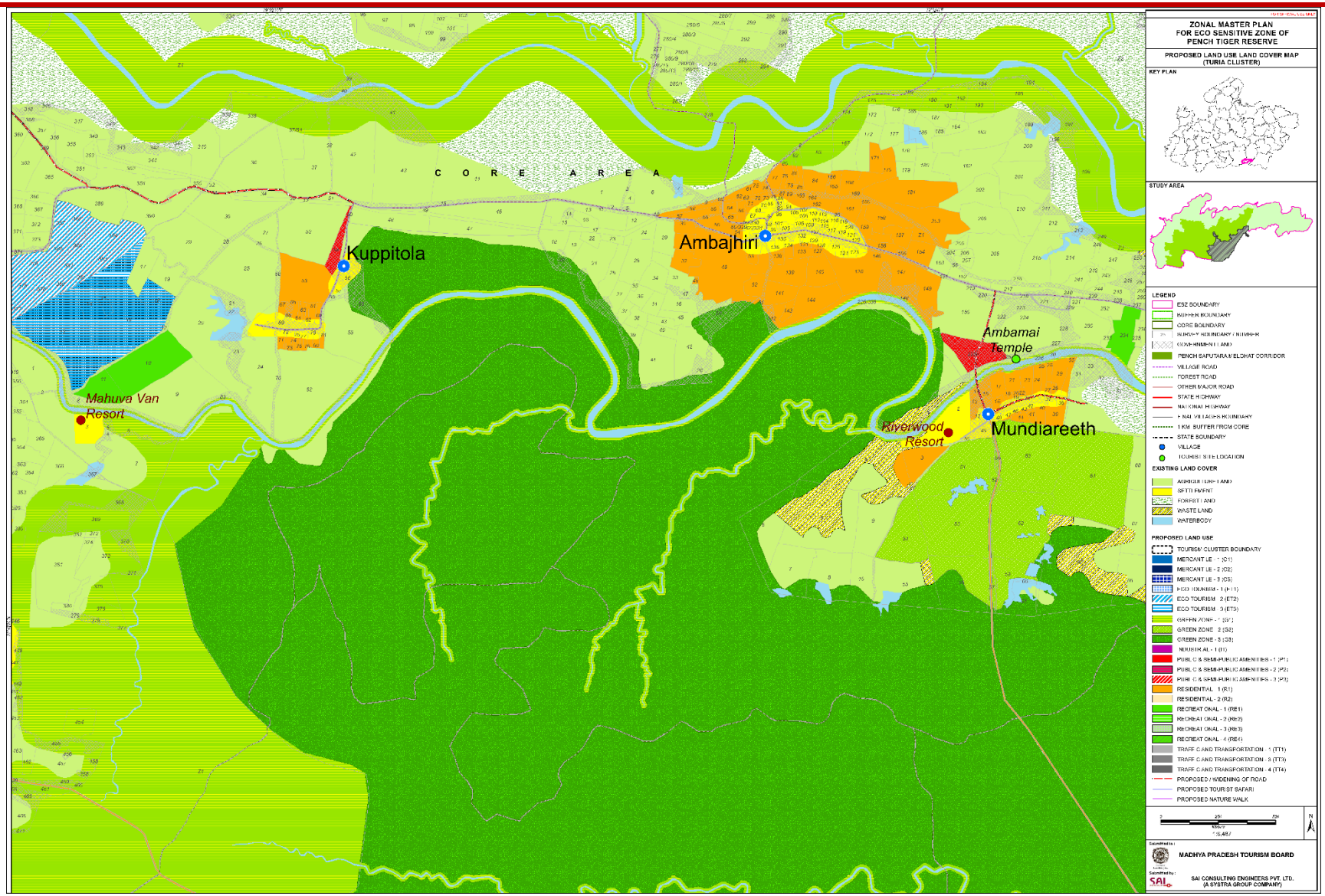


Figure 5- 2: Existing Accommodation Facilities-Part 2

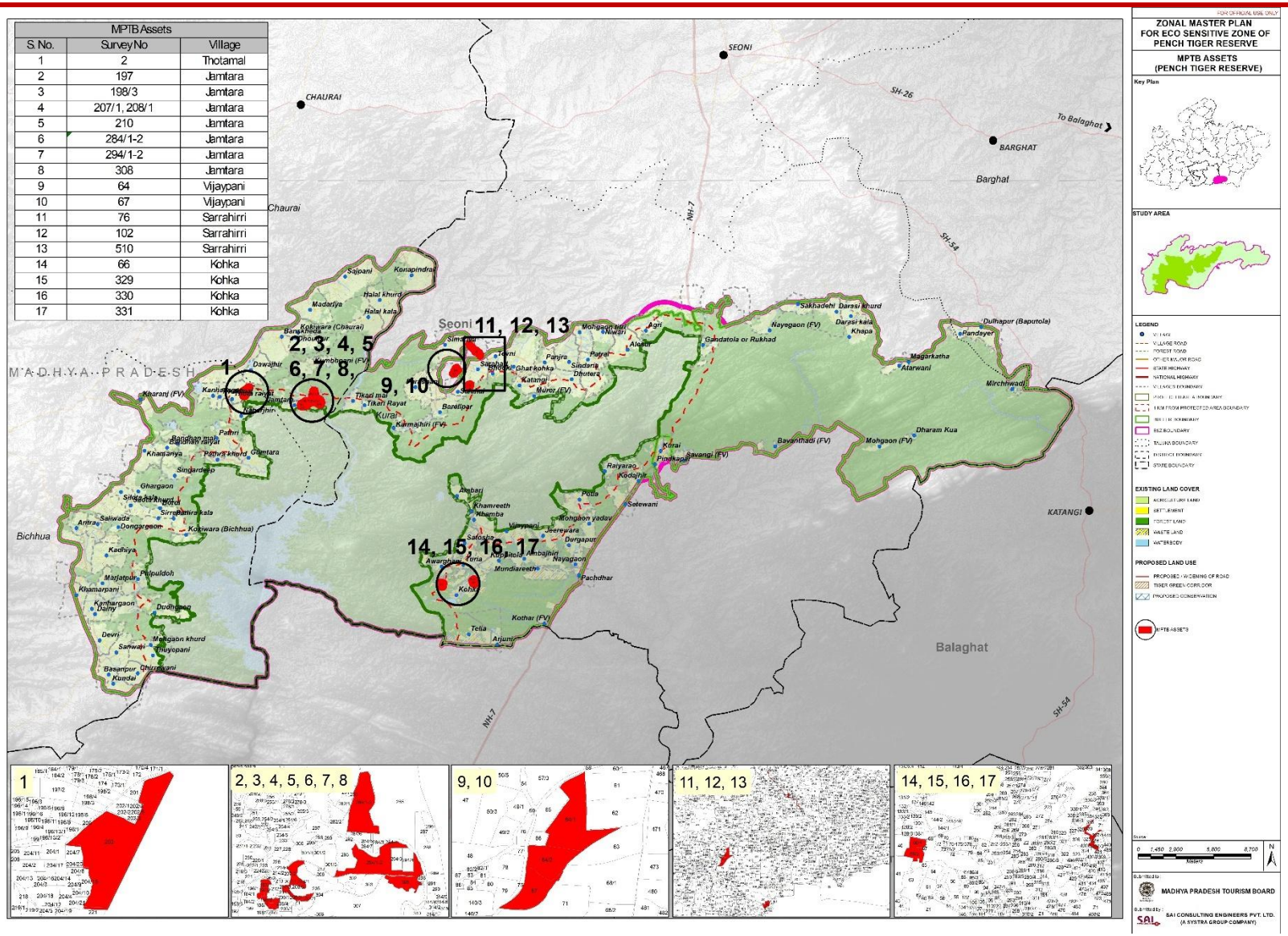


Figure 5- 3: MPTB. Assets

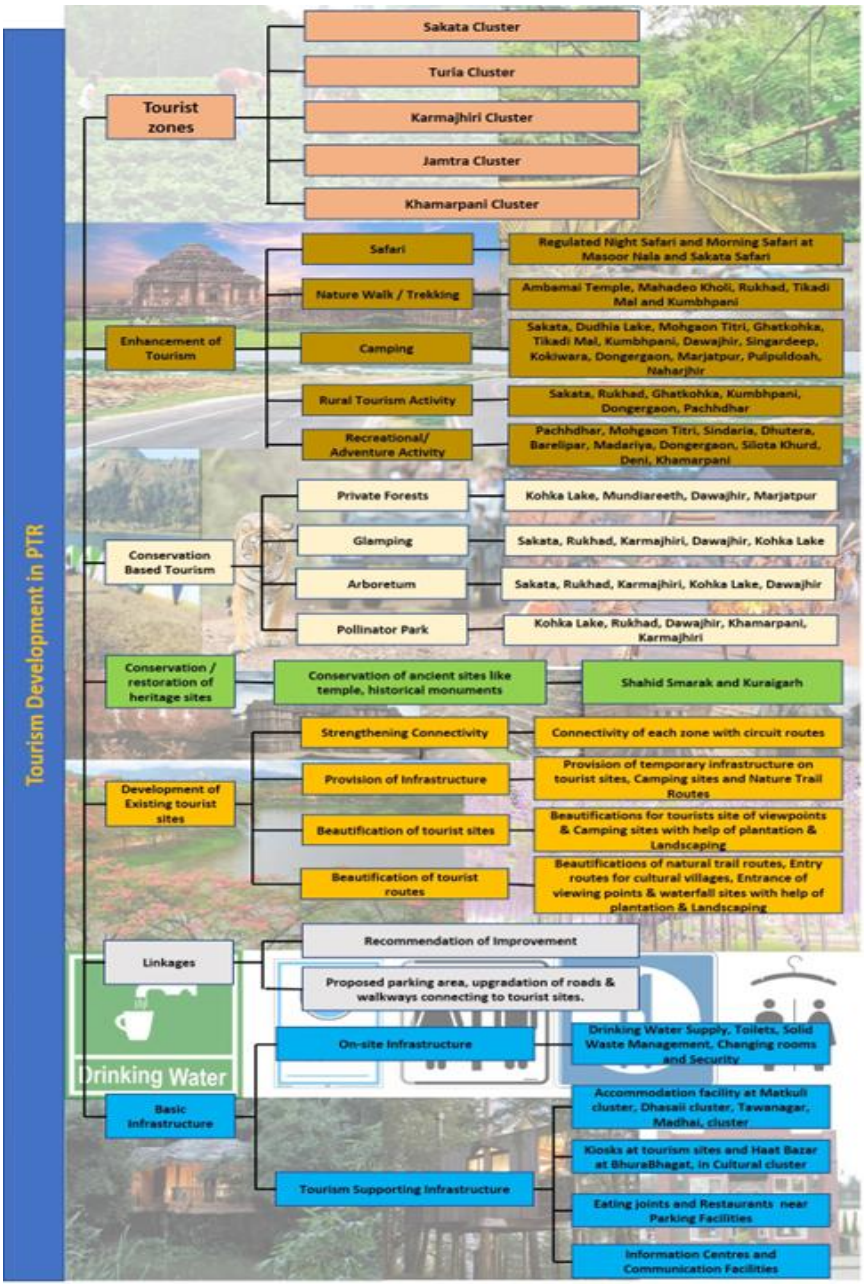


Figure 5- 4: Tourism Potential sites in PTR

There are multiple locations and areas which are identified to develop as tourist spots and tourist activities. These areas and proposals are identified and proposed based on existing analysis of the region, stakeholders' consultations and potential of sites.

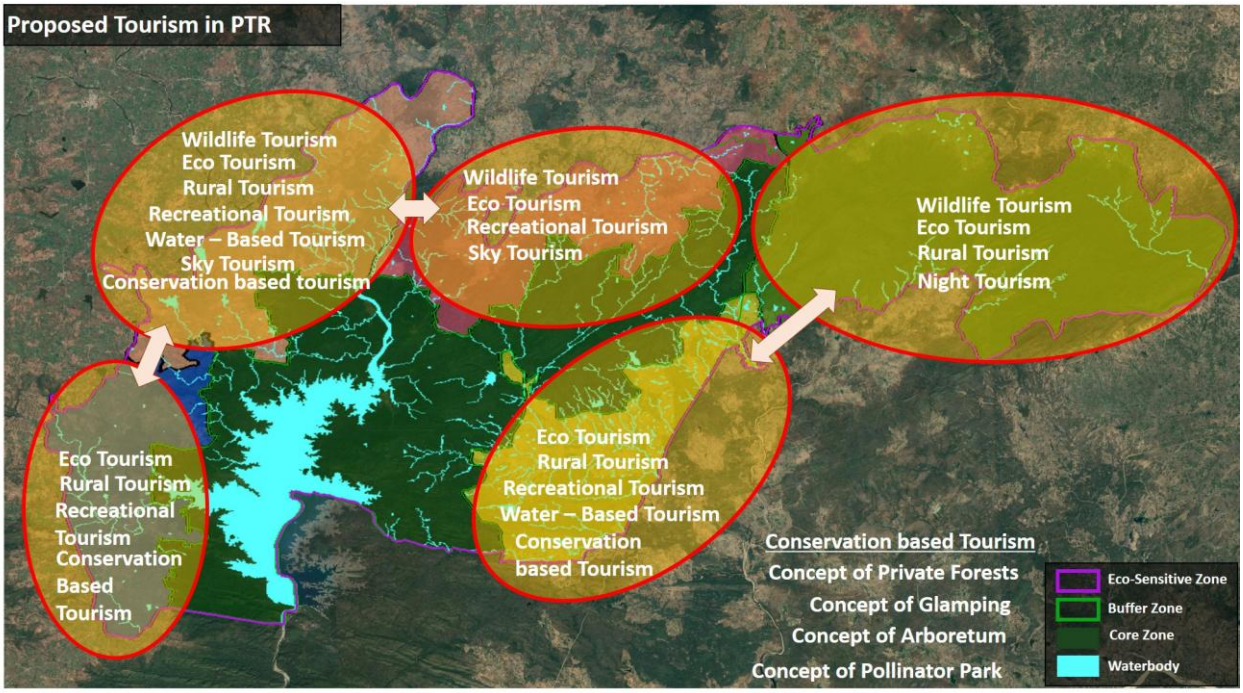
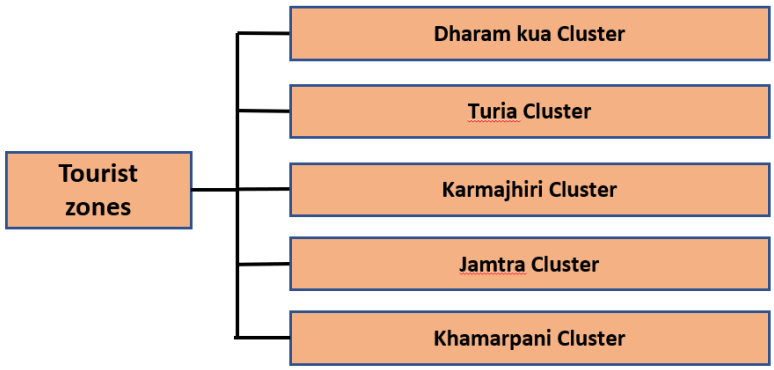


Figure 5- 5: Tourism Potential sites in PTR

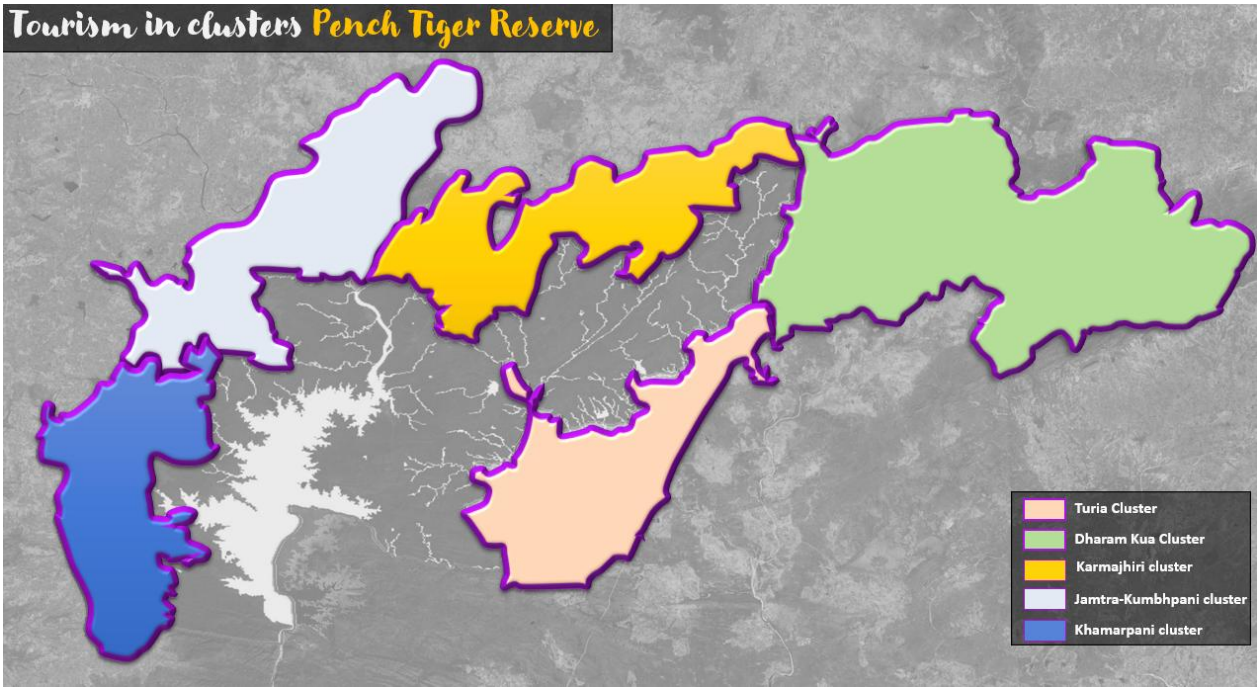
1.2.5.2 Tourist Zones

Tourism in Pench Tiger Reserve is flourished around Turia with focus of wildlife and weekend destinations. The area has excessive tourist arrivals and increasing biotic pressure of the region. The other area of Karmajhiri, Jamtra and Dharam Kua having niche tourism with having limited activities. With purpose for win- win situation in tourism segment, an idea of inclusive tourism in clusters has been promoted. By which, the pressure can be distributed among all the clusters. The tourism zones and the activities proposed are as below.



On basis of Tourism sites, profile of area and primary tourism in areas, it is divided in tourism zones. These zones are further divided in tourism clusters with having proposed activities or enhancement in existing activities in the cluster based on tourism zone.

Figure 5- 6: Tourist zones in ESZ



Classified Tourism zones are Wildlife Tourism Zones, Eco-Tourism Zones, Recreation zone, Rural Tourism zone, Religious zone, Religious Tourism zone, Nature tourism zone and Commercial & Accommodation Zone. The tourism zones are created on basis of primary tourism activities in region, other eco-tourism activities will be as supporting activities in region. These zones include area of Pench Tiger Reserve as follow:

Table 5- 1: Tourist Zones

Sr No	Tourism cluster	Potential Tourism Activities
1	Dharam Kua Cluster	Wildlife tourism, Eco-Tourism, Adventure activities, Rural Tourism, Late evening Tourism
2	Turia Cluster	Eco-Tourism, Water Tourism, Adventure Activities
3	Karmajhiri Cluster	Wildlife tourism, Eco-Tourism, Adventure activities, Rural Tourism, Late evening Tourism
4	Kumbhpani – Jamtra Cluster	Wildlife tourism, Eco-Tourism, Adventure activities, Rural Tourism, Late evening Tourism, Conservation based tourism
5	Khamarpani Cluster	Commercial activities, Conservation based tourism

1.2.5.2.1 Dharam Kua Cluster

Following activities are potential to attract the tourists in Dharam Kua as well as to preserve the natural resources of the area.

Figure 5- 8 : Dharam Kua Cluster Tourism Activities

Following tourism activities has been proposed in the cluster

Table 5- 2 : Tourism activities in Dharam Kua cluster

Sr No	Proposals	Location
1	Wildlife safari	Dharam Kua
		Masoor nala barrier
2	Nature Trail	Ambamai Temple
		Mahadeo Kholi
		Rukhad-Ussekatta Trail
3	Camping	Dharam Kua
		Dudhia Lake
4	Rural Tourism/ Model villages	Dharam Kua
		Rukhad
5	Late evening Tourism	Dharam Kua
6	Hot air Balloon	Kurai
7	Glamping	Dharam Kua
		Rukhad
8	Pollinator Park	Rukhad
9	Arboretum	Dharam Kua
10	Arboretum	Rukhad

1.2.5.2.2 Turia Cluster

The cluster is already flashpoint attraction for tourists. The major tourists visit the area due to wildlife sighting and availability of accommodation. The area is already under tourist pressure and it has more tourists than prescribed carrying capacity in the area. The tourism in this area is already developed with two wildlife safari and two nature trails, which provides the mesmerising experience of the forest and

mother nature. The area is proposed with the water tourism as it has plenty of surface water sources is available. The water-based adventure activities are proposed in Kohka lake.

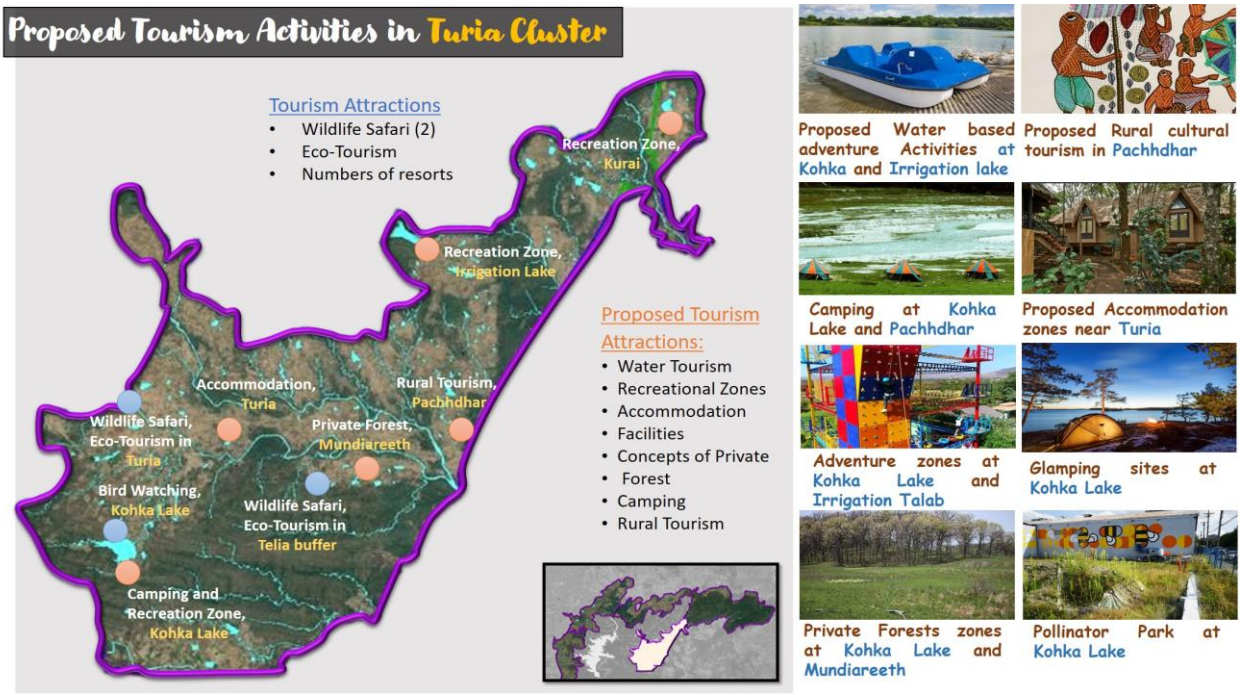


Figure 5- 9 : Turia Cluster Tourism Activities

Following tourism activities has been proposed in the cluster.

Table 5- 3 : Tourism activities in Turia cluster

Sr no	Proposals	Location
1	Adventure Activities	Pachhdhar
2	Rural Tourism/ Model villages	Pachhdhar
3	Glamping	Kohka Lake
4	Pollinator Park	Kohka Lake
5	Arboretum	Kohka Lake

1.2.5.2.3 Karmajhiri Cluster

The primary tourism activity in tourism is wildlife safari from Karmajhiri Gate. The primary activity in area is agriculture. There are very limited safaris available as per approved carrying capacity. The area is proposed with focus on rural tourism, agriculture walk and eco-tourism activities like nature trails, Glamping and camping and many more. An adventure park with theme base of Mougali is proposed near Ghatkohka village.

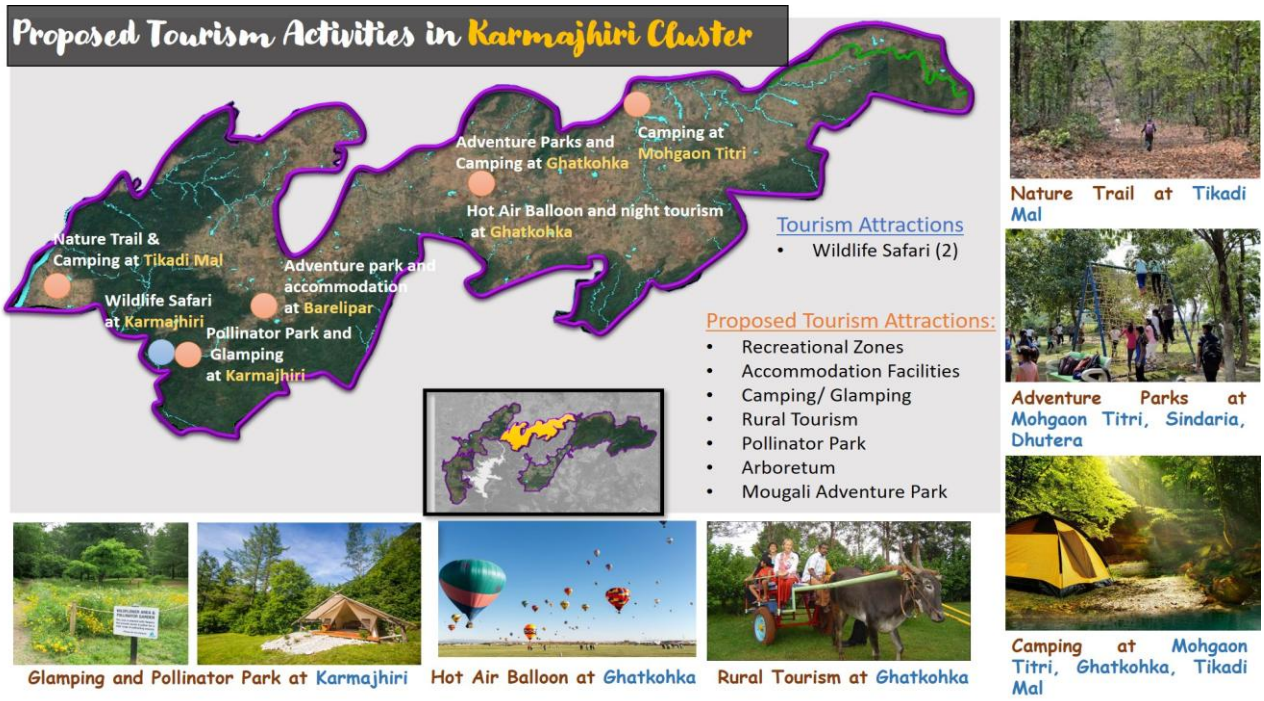


Figure 5- 10: Karmajhiri Cluster Tourism Activities

Following tourism activities has been proposed in the cluster.

Table 5- 4 : Tourism activities in Karmajhiri cluster

Sr No	Proposals	Location
1	Nature Trail	Tikadi Mal
2	Camping	Mohgaon Titri
	Camping	Ghatkohka
	Camping	Tikadi Mal
3	Adventure Activities	Mohgaon Titri
	Adventure Activities	Sindaria
	Adventure Activities	Dhutera
	Adventure Activities	Barelipar
4	Rural Tourism/ Model villages	Ghatkohka
5	Late evening Tourism	Ghatkohka
6	Hot air Balloon	Ghatkohka
7	Glamping	Karmajhiri
8	Pollinator Park	Karmajhiri
9	Arboretum	Karmajhiri

1.2.5.2.4 Jamtra – Kumbhpani Cluster

The cluster has immense potential for the tourism activities. All kind of inclusive tourism has been proposed in the cluster area. The cluster has the benefits of having waterbodies of Pench River and other large surface ponds and reservoirs. The village of Kumbhpani can be developed as the model village for the rural tourism. The water-based adventure activities are proposed on Lake of dawajhri and Kanhasagar as the throughout year water availability in both the reservoirs.

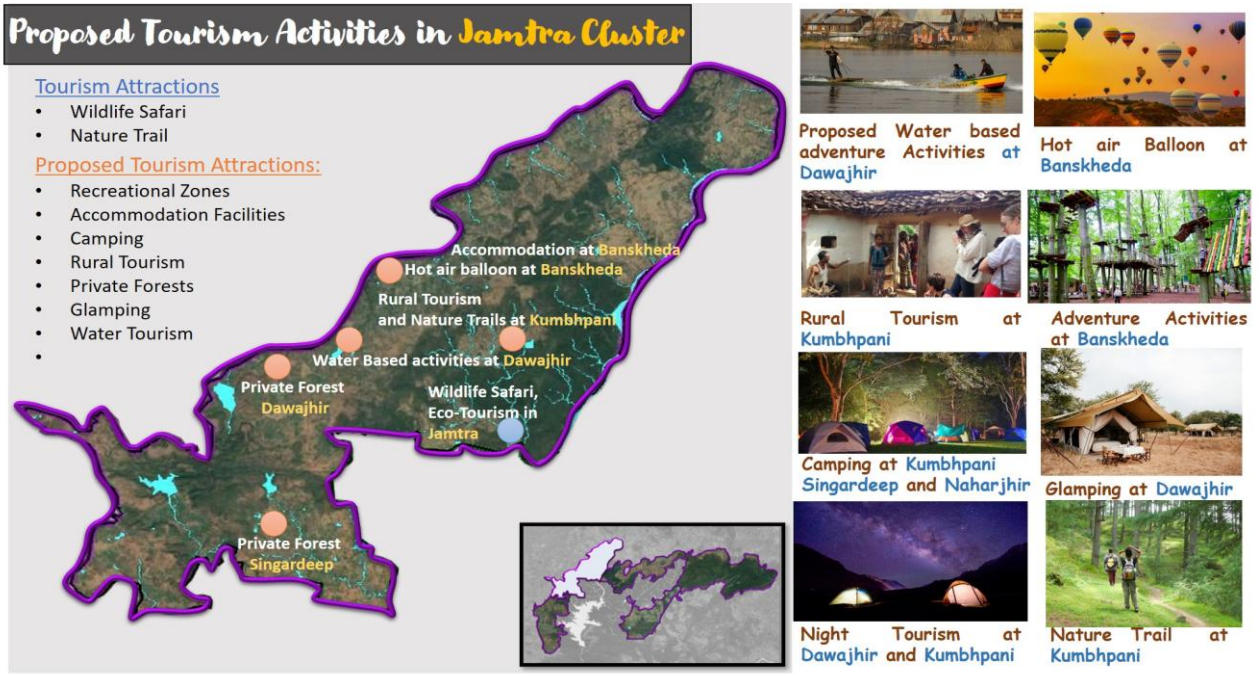


Figure 5- 11: Jamtra-Kumbhpani Cluster Tourism Activities

Following tourism activities has been proposed in the cluster.

Table 5- 5 : Tourism activities in Jamtra-Kumbhpani cluster

Sr no	Proposals	Location
1	Nature Trail	Kumbhpani
2	Camping	Kumbhpani
	Camping	Dawajhir
	Camping	Singardeep
	Camping	Naharjhir
3	Adventure Activities	Madariya
4	Rural Tourism/ Model villages	Kumbhpani
5	Late evening Tourism	Dawajhir
	Late evening Tourism	Kumbhpani
6	Hot air Balloon	Banskheda
7	Glamping	Dawajhir
8	Pollinator Park	Dawajhir
9	Arboretum	Dawajhir

1.2.5.2.5 Khamarpani Cluster

Khamarpani cluster has no existing tourism available at present. The cluster has potential for commercial and industrial developments. The surrounding villages of Khamarpani like Pulpuldoah, Dudhgaon and Thuyepani has potential to be developed as ecotourism zones in the region. These villages are nearby of the Protected area and having unique landscapes. The area is a bit distant from other tourism zones and less popular in terms of tourism. The purpose of proposing tourism in this area is to attract the local surroundings like Bichhua, Chhindwara and other nearby small towns of Madhya Pradesh and Maharashtra to increase the footfall. This will lead to provide employment to locals and help to reduce the illegal fishing activities from Totaladoh reservoir of Protected zone. (Working Plan, PTR 2025)

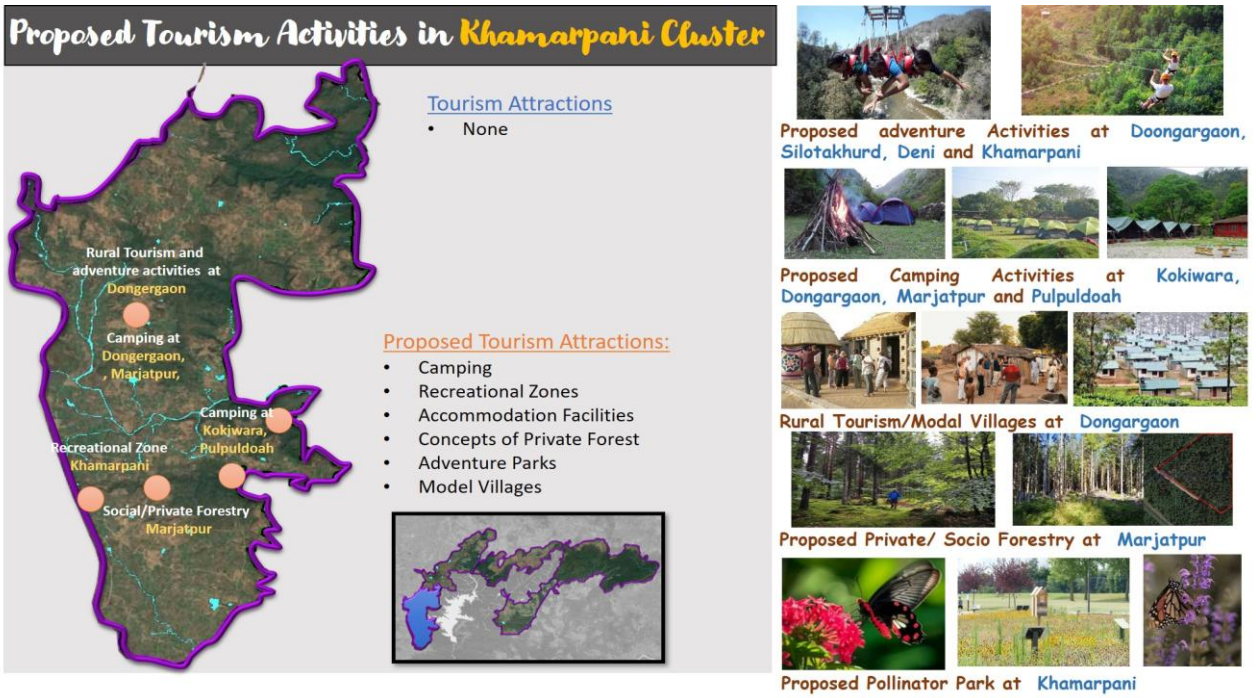


Figure 5- 12: Khamarpani Cluster Tourism Activities

Following tourism activities has been proposed in the cluster.

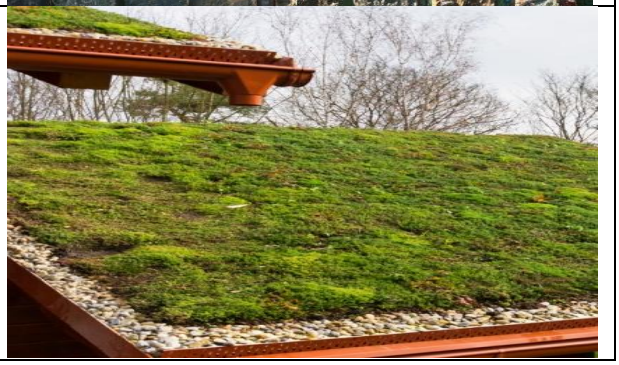
Table 5- 6 : Tourism activities in Khamarpani cluster

Sr no	Proposals	Location
1	Camping	Kokiwara
		Dongergaon
		Marjatpur
		Pulpuldoah
2	Adventure Activities	Dongergaon
		Silota Khurd
		Dongergaon
		Deni
		Khamarpani
3	Rural Tourism/ Model villages	Dongergaon
4	Pollinator Park	Khamarpani

1.2.5.2.6 Suggestive Measures for Use of Eco-Friendly material

The suggestive measure for the construction/upgradation of hotels and Resorts to use Eco- Friendly materials which is locally available in the ESZ area. Such eco- Friendly materials are Cob, Clay- Brick, Recycle Glass and plastics and Plant base roofing etc.

Cob Cob is a mix of subsoil, water, **fibrous organic material** (typically longer straw), in some cases lime. Cob gives the freedom to create any shape. It creates **a natural insulation** and is very energy efficient.	
Bamboo Bamboo is a type of plant that grows back quickly within only 3-5 years. It is 100% **biodegradable, antibacterial and Eco-friendly** if not chemically processed. Bamboo has high strength because of its fibres running	
Clay Brick Clay brick is a natural material made from water and clay from the earth. It is entirely **recyclable, entirely Earth-friendly**, and it doesn't release any toxic chemicals when in the landfill. Clay brick is an **energy-efficient material**. In the summer, it keeps a house cooler, and in the winter traps the warmth for a more extended period.	

Enviroboard Enviroboard is a **fire and water-resistant board** made up of magnesium, sawdust, and fibre cloth. These boards are typically used for **wall lining, roof lining, and underlay systems**. Due to its green manufacturing, they don't release extra carbon emissions.	
Recycled Glass & Plastics Waste glass can replace natural aggregates like **sand, gravel and crushed stone**, making it a great option for more sustainable cement varieties. Recycled plastic can be used to create **plastic sheets, concrete, bricks, lumber, pipes, roofs, floors, and PVC**	
Plant based roofing Green roofs integrate living plant material into the roofing surface. Roofs made with dried leaves provide insulation as well as cost effective alternative	

1.2.5.2.7 Suggestive Measures for Usage of Vernacular architecture

It is suggested to incorporate vernacular architecture during upgradation/ Constructuion of hotels and resorts in the Eco-Sensitive Zone (ESZ) around Pench Tiger Reserve can be both environmentally responsible and culturally enriching. The suggestive measures that can be taken to blend modern hospitality with the local heritage and ecological needs:

1. **Material Selection**

- Local, Sustainable Materials: Use locally sourced materials like stone, wood, bamboo, and mud. These materials are climate-appropriate and reduce the carbon footprint associated with transportation.
- Natural Insulation: Incorporate materials like thatched roofs or mud walls to naturally regulate temperature, reducing the need for energy-intensive cooling and heating systems.

2. **Design Aesthetic**

- Traditional Roofs: Use steeply pitched roofs, a hallmark of local vernacular architecture, to prevent water accumulation and to blend with the natural landscape.

- Open Courtyards and Verandas: Design spaces that encourage natural ventilation, like open courtyards and wide verandas that can cool down buildings naturally.
- Earthen Walls and Plaster: Clay plaster or lime-based finishes on walls provide a cooling effect and are locally available.

3. Building Orientation

- Respect for Sun and Wind Directions: Buildings should be oriented in a way that maximizes natural cooling and heating through passive solar design techniques. Large windows facing cooler wind directions can help harness cross-ventilation.

4. Ecological Integration

- Landscape and Green Roofing: Integrate green roofs or terrace gardens that blend the structure with the surrounding environment and help reduce heat island effects. This can also promote biodiversity.
- Rainwater Harvesting and Groundwater Recharge: Vernacular techniques like rainwater harvesting, ponds, and wells should be employed to manage water sustainably, essential in eco-sensitive zones.

5. Sustainable Energy Systems

- Solar Panels and Wind Energy: To further minimize the environmental footprint, solar panels and small-scale wind turbines can be used, which are aesthetically integrated with the architectural style.
- Biogas for Cooking: Encourage the use of biogas, where appropriate, for cooking and heating purposes.

6. Traditional Craftsmanship

- Incorporation of Local Craft Techniques: Using local craftsmanship, such as hand-woven textiles, locally made furniture, and traditional building techniques, can help preserve cultural identity while providing authentic guest experiences.
- Eco-Friendly Furnishings: Traditional woodcarvings and locally produced textiles (like handloom fabrics) can be used in interior design while ensuring sustainability.

7. Water Conservation

- Efficient Water Management Systems: Design rainwater harvesting systems, wastewater treatment plants, and efficient plumbing to reduce water consumption.
- Natural Wastewater Treatment: Use locally adapted bio-filtration systems or reed beds for wastewater treatment that do not interfere with the local ecosystem.

8. Cultural Context and Aesthetic Integration

- Traditional Local Styles: Design features such as Jharokhas, Chhatris (elevated canopies), wooden balconies, and mud paintings can connect the resort/hotel with local heritage.
- Community Involvement: Collaborate with local artisans, architects, and community members to ensure the buildings reflect the authentic culture of the region.

9. Wildlife-Friendly Design

- Minimal Light Pollution: Keep lighting minimal and use warm-toned, low-intensity lights to avoid disturbing nocturnal wildlife.
- Use of Fencing and Barriers: Design resort boundaries with wildlife-friendly barriers that don't impede animal movement or create hazards, such as low-impact, non-invasive natural barriers.

10. Eco-Friendly Waste Management

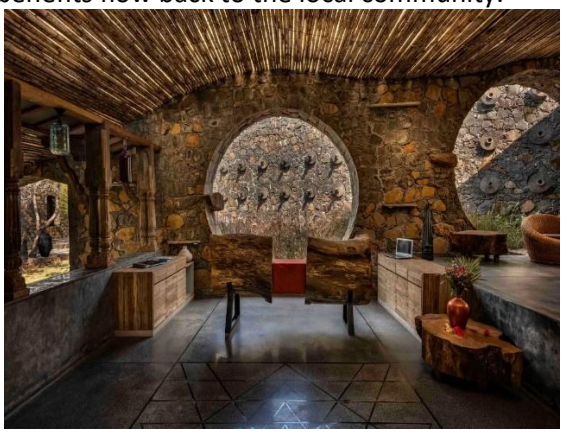
- Composting and Waste Segregation: Implement a waste management system that promotes composting of organic waste and recycling to reduce landfill impact.
- Biodegradable Products: Use biodegradable or locally recyclable products for daily operations, like natural fiber packaging and utensils.

11. **Local Community Engagement**

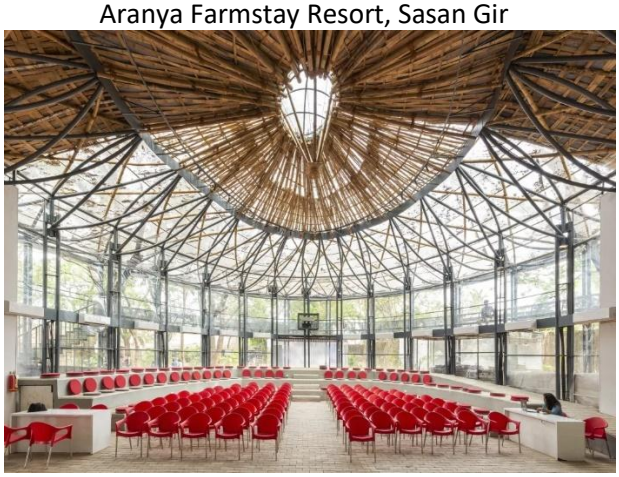
- Promote Local Culture: Resorts and hotels can offer experiences that introduce guests to local crafts, food, traditions, and folklore, which would support local artisans and help preserve cultural heritage.

- Community-Based Tourism: Encourage local participation in hospitality services like guiding, cooking, or craft sales, ensuring that the tourism benefits flow back to the local community.

Aranya Farmstay Resort, Sasan Gir



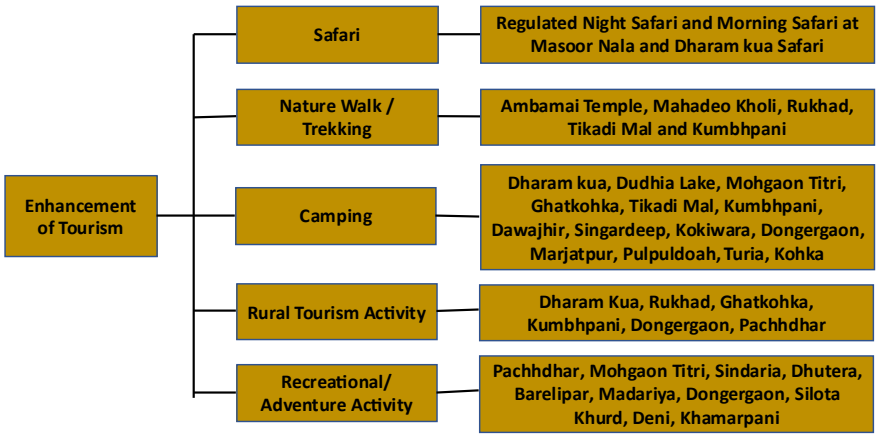
Kondan Retreat Resort, Pune



Koodaaram Kochi Muziris Pavilion, New Delhi

The apple farm stay, Kot Khai

1.2.5.3 Enhancement of Tourism Activities in identified tourist sites



Various types of tourism can be promoted as per tourism zones and its clusters. Mainly enhancement proposed in safari, nature trails, camping and adventure activities. These activities are eco-tourism activities which are suitable to STR. Late Evening safari and Ropeway are proposed activities to boost the tourism.

Figure 5-11 :Enhancement of Tourism Activities in Identified Tourist Sites

1.2.5.3.1 Wildlife Safari

Pench Tiger Reserve is well-known for its wildlife. The major tourist attraction is Turia Gate as it has well facilitated accommodation and more numbers of wild-life safari is permitted. At present, there are 3 safari

gates for Protected area safari namely, Jamtra, Karmajhiri and Turia. There are three safari routes in buffer namely, Telia, Rukhad and Kumbhpani. There is one route is in planning which is Masood Barrier route, which will be sanctioned in forthcoming time. The existing and proposed safari routes in PTR are as below figure. (Working Plan, PTR 2025)

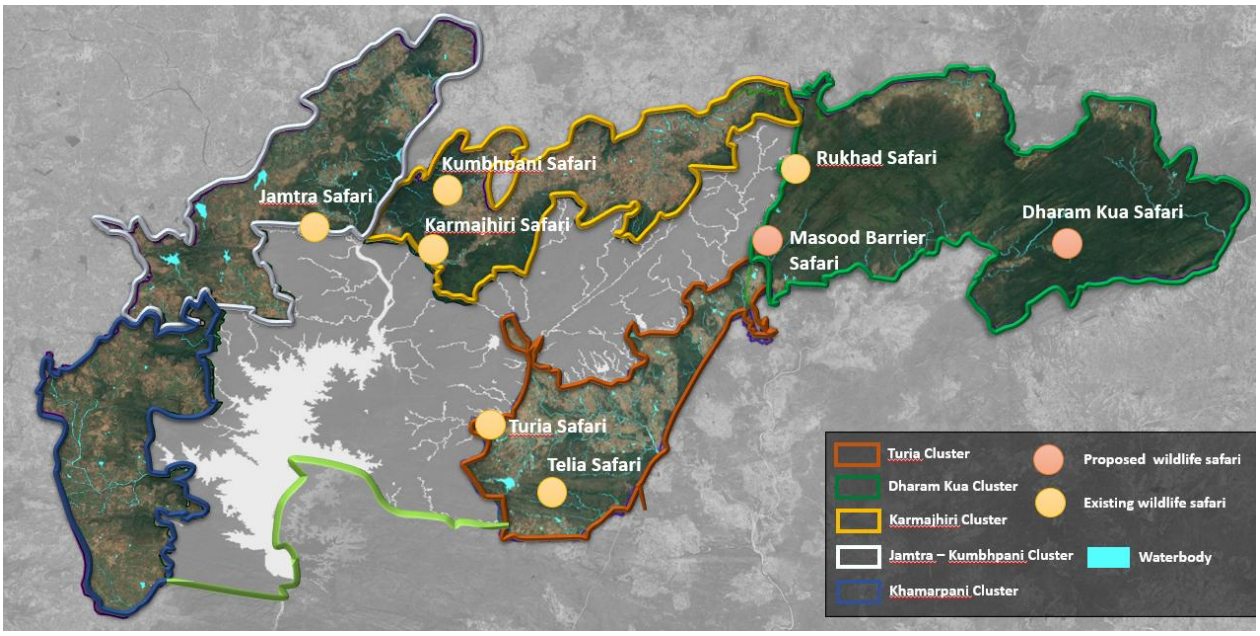


Figure 5- 13: Existing and Proposed Wildlife tourism activities

Proposed Safari in Dharam Kua cluster

Dharam Kua cluster has mixed forest of bamboo, Sagon and Grasslands, which is suitable for animal habitat. The presence of many wild animals has been observed including Tiger, Leopard, Deer, Jackle and many more. The area has is rich in diversity. A forest guesthouse in village Dharam Kua is there, which gives accommodation facilities to tourists. The area provides mesmerizing forest experience and wildlife sighting together. A safari route is proposed of 49.64 km approximately in this region. A proposal for including village exploration, canteen and a break in between safari to be proposed in Dharam Kua village. The facilities shall be developed by Eco-Development Committee of the village. (Working Plan, PTR 2025)

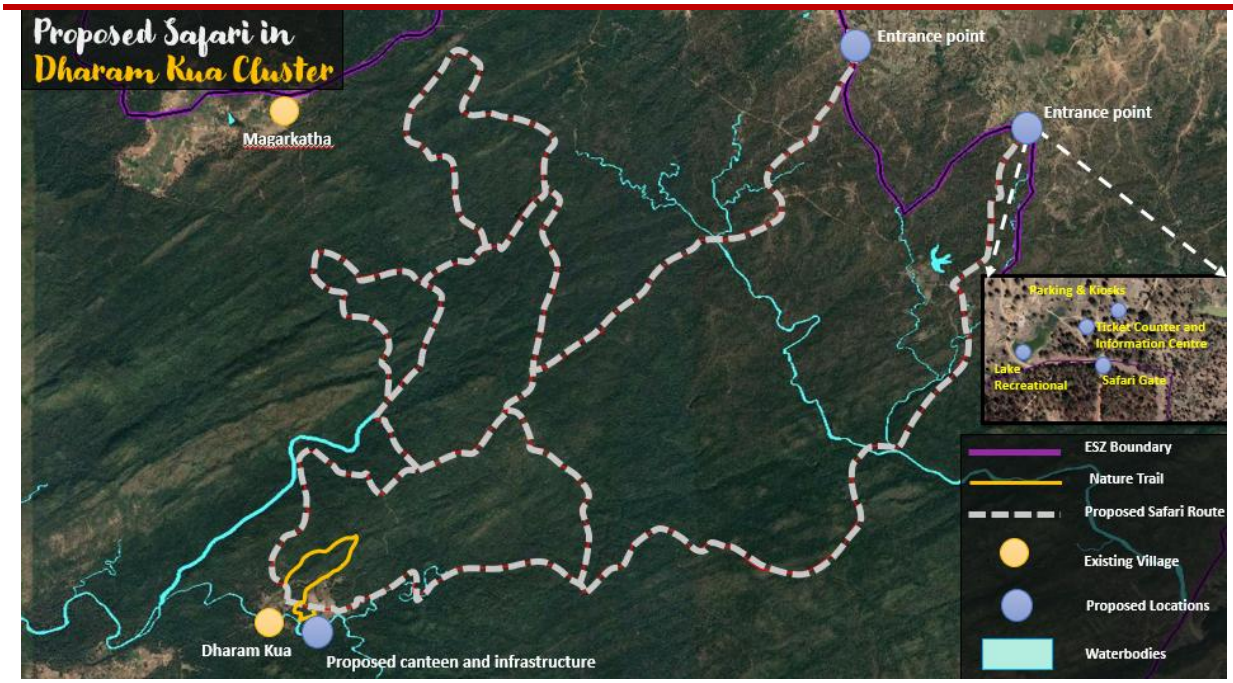


Figure 5- 14: Dharam Kua Wildlife Activities

The safari route in Dharam Kua cluster is proposed as per above figure. The canteen and other supportive infrastructure to be developed in Dharam Kua village for tourists. A small village tour can also be arranged in safari tour to experience the rural atmosphere with the nature. It can provide tourist a better experience of harmonization between man and environment.

Masoor Nala Barrier

Masoor Nala is another barrier of entrance to Rukhad Range. Rukhad range has mixed forest of bamboo and Sagon. It provides and experience of the denseness of jungle with undulating landscape and small riverine. A point of Kuraigarh is proposed as the viewpoint to Pench Tiger Reserve, which gives a scenic green view of Pench. There are some of carnivores like Tiger, Fox and many more are observed during the daytime also. Apart from that the presence of herbivores are also observed in the area. Total length of proposed route is 42.73 km approximately.

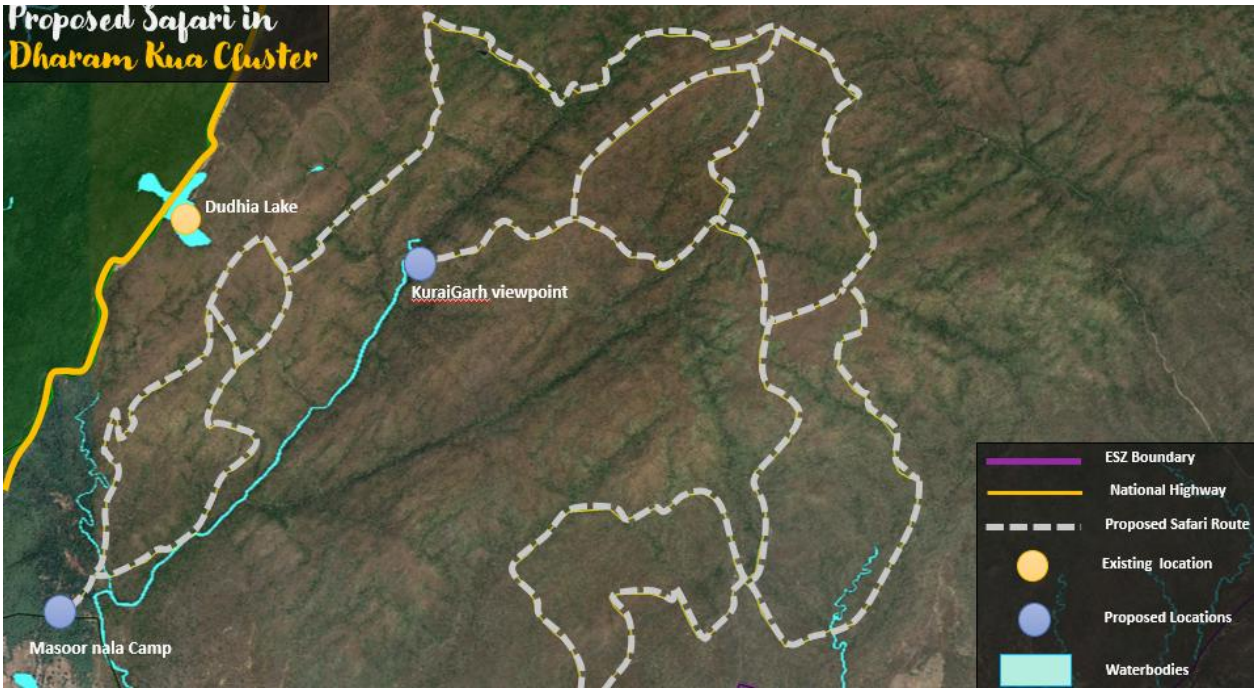


Figure 5- 15: Masoor Nala Wildlife Safari

1.2.5.3.2 Nature Trails and Cycle Routes

Nature Trails are best way to explore the nature by walking in forest, acknowledging about flora fauna and taking experience to wander in forests. PTR has very dense and bio-diverse forest. Pench is habitat of variety of species of birds like Great Cormorant, Cattle ergate, Bramhini Duck, Kites and many more. These all can be visible during the nature trail in buffer as well as protected area. Existing and Proposed nature trails of Pench Tiger Reserve are as below figure. (Working Plan, PTR 2025)

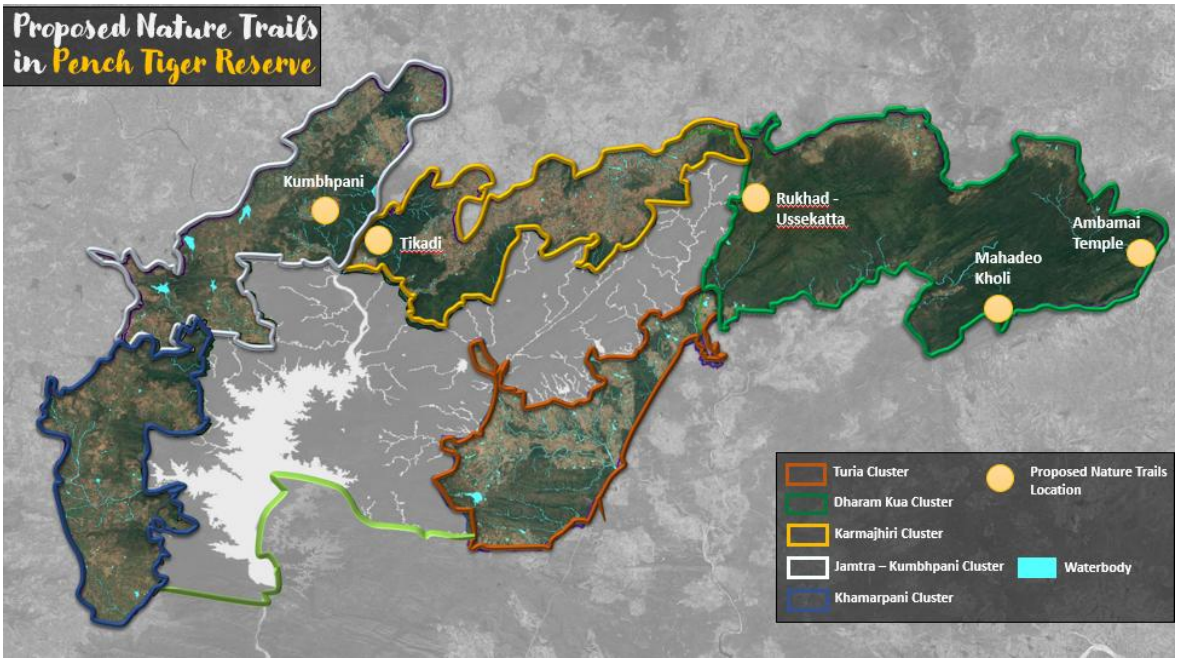


Figure 5- 16: Proposed Nature Trails

Proposed nature trails are for Mahadeo Kholi and Amba mata temple nature trail in Dharam Kua cluster, Kumbhpani Nature trail in Jamtra cluster, Rukhad to Usekatta nature trail in Dharam Kua cluster, Tikadi Mal Nature trail in Karmajhiri cluster. All locations have advantage of forest and waterbody both.

Following Nature Trails are proposed with tentative routes as per their unique feature and characteristics.

Naharjhir dam to Amba mata

The nature trail has minor sloppy hiking with beautiful view of Naharjhir Dam. The trail route also cover the landscape view of Dam and the dense jungle of Pench Tiger Reserve. The tentative length of the Nature trail is 2.89 km.

Mahadeo Kholi

A nature trail to experience the nature with undulating area of Mahadeo Kholi is proposed in the area. The length of the nature trail is approximately 3.51 km. This nature trail can provide wonderful experience mixed with hiking and exploring jungle of Pench.

Kumbhpani Nature trail

The Forest village has the unique potential to be the model forest village as it is covered from forest of buffer from all the sides. A nature trail of 4.16 km to experience the dense jungle of the buffer from the forest rest house to the mesmerising jungles of the Pench.

Rukhad to Usekatta

Rukhad is the small forest village on National Highway with entrance to the wildlife Safari gate. The forest of the Rukhad range is the mixed forest with presence of herbivores and carnivores, both. Ussekatta Talab is the major source of water for the wild animals. The nature trail of length 9.97 km is proposed to provide a combine experience of the wilderness.

Tikadi Mal Nature trail

Tikadi Mal is the village located amidst forest on banks of Pench River. A nature trail of 4.65 length is proposed to experience the richness of biodiversity of Pench river along with dense and wilder forests of buffer.

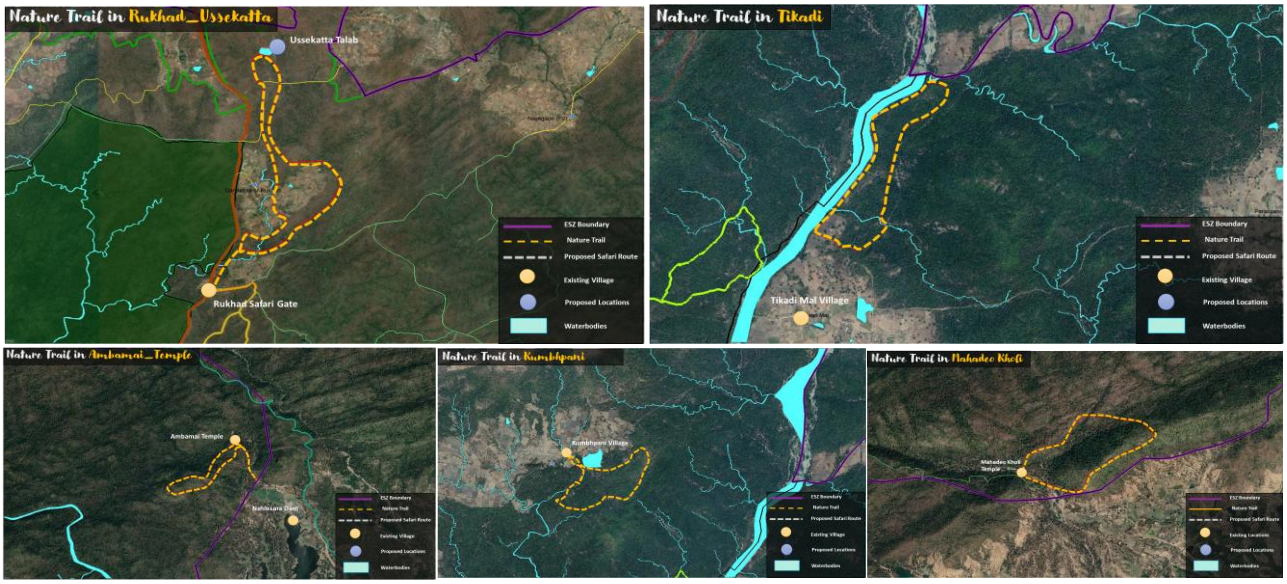
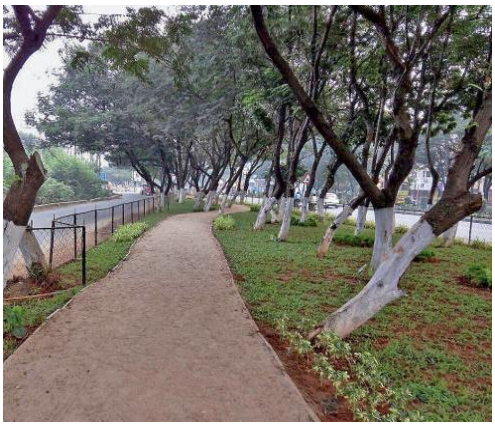


Figure 5- 17 : Proposed Nature Trails

A river walk or river explorations can be initiated after brief study in nearby river Bawanthadi by Forest Department. It has an immense potential for natural tourism but as the area is also sensitive in terms of wildlife habitat, a brief study shall be done.

The infrastructure and development of nature trails are suggested to be as per following.




Paved or Moharram paved trails to sites is preferable for access Nature trail to attract the more tourist and experience jungle at its best and safe way.

Figure 5- 18: Beautification of Nature Trails

An attractive entrance can be provided to natural trail with having cultural, wildlife or any significance to the entrance. A security post cum ticket center can be provided with entrance gate.

Figure 5- 19: Entry and Exit Gates

The rest huts to be provided along with refreshment points at 1 km distance. It should be safe and securely covered with bamboo and other material to get protection from wild animals in jungle area.

Figure 5- 20: Rest Huts

1.2.5.3.3 Camping

Camping is the best way to experience the nature with many components like river, mountain, and flora fauna. Pench Tiger Reserve has some of most suitable sites for camping to experience the nature. Dudhia Talab and Narer is the existing site for camping in Pench Tiger Reserve. The camping sites are proposed based on criteria of presence of forest, waterbodies, animal movement in area, surrounding atmosphere and availability of basic amenities. The proposed camping sites are Dharam Kua, Kumbhpani, Turia, Kohka,

Dawajhir, Tikari mal, Singardeep, Dudhia Talab, Ghatkohka, Marjatpur, Pulpuldoah, Dongergaon, Kokiwara and Mohgaon Tikri.

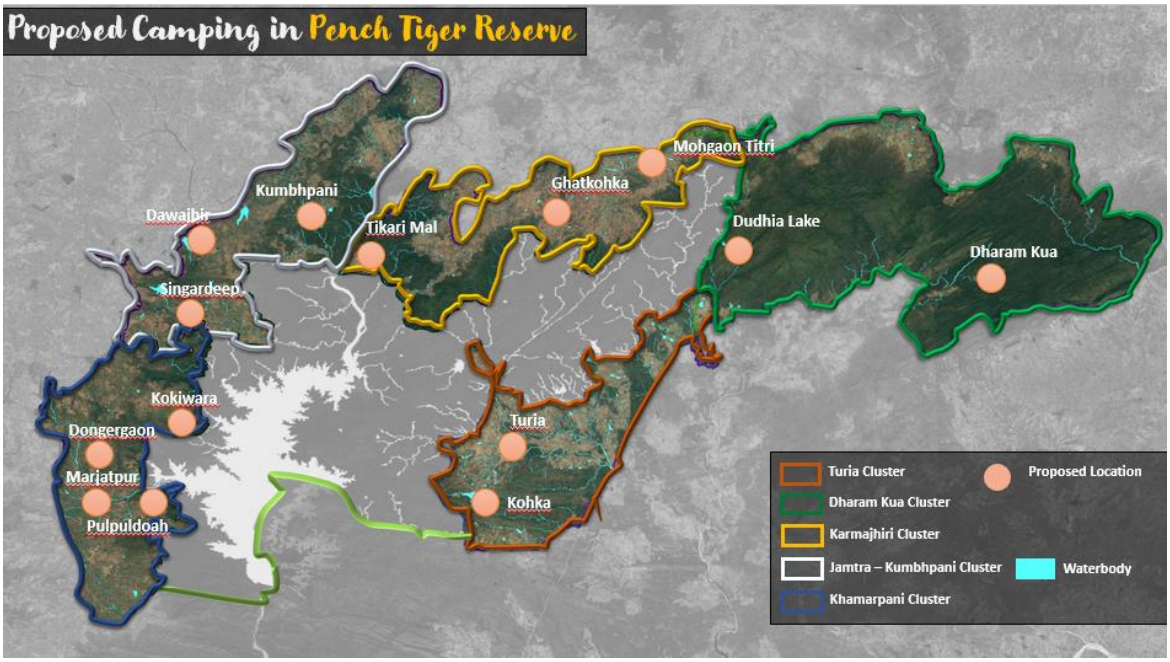


Figure 5- 21: Proposed Camping sites

Kohka lake, Dudhia Talab and Tikari Campsites are alongside the waterbodies. (Working Plan, PTR 2025) These sites provide beautiful view of waterbodies alongside with forest. All sites are surrounded by less dense forest and have minimum animal movement in area. Dharam Kua and Kumbhpani are surrounded by the dense forest and provide the experience of rich forest as nature's touch. Camping at Dokrikheda dam can be used as accommodation as well as for recreational activities both. The required infrastructure for the camping are storage rooms for tents, Kitchen, Parking, mobile infrastructure for toilets and bath. The rules and regulation will be as per decided by responsible authority and Pench Tiger Reserve.

Table 5- 7 : Camping Location

Sr No.	Camping Location	Sr No.	Camping Location	Tourism Infrastructure
1	Dharam Kua	8	Dudhia Talab	Tourist Lounge with Waiting area, reception, and Ticket counter. Toilets, Bathrooms, Kitchen, dining area, Locker room, Activity Areas.
2	Kumbhpani	9	Ghatkohka	
3	Turia	10	Marjatpur	
4	Kohka	11	Pulpuldoah	
5	Dawajhir	12	Dongergaon	
6	Tikari mal	13	Kokiwara	
7	Singardeep	14	Mohgaon Tikri	

1.2.5.3.4 Adventure Activities

Pench Tiger Reserve has relation with the Maugali from Jungle Book of Rudyard Kipling. Mougali is famous for its adventure activities in Dense deep forest of the Pench. To recreate the story of Jungle book, a theme-based adventure park is proposed near Ghatkohka village of PTR. The thematic adventure park can

be developed as per the storyline of the Jungle Book to provide adrenaline experience of thrilling life og Mougali. Apart from that, for recreational purposes, Adventure Parks in Karmajhiri, Turia, Kohka, Khamarpani and Banskheda are proposed. The activities like Rope Climbing, cycling, Bungee jumping, swoop swing, Painball, Sky cycling, High Rope Challenge, archery and many more. (Working Plan, PTR 2025)

Figure 5- 22: Examples of Adventure Based Tourism

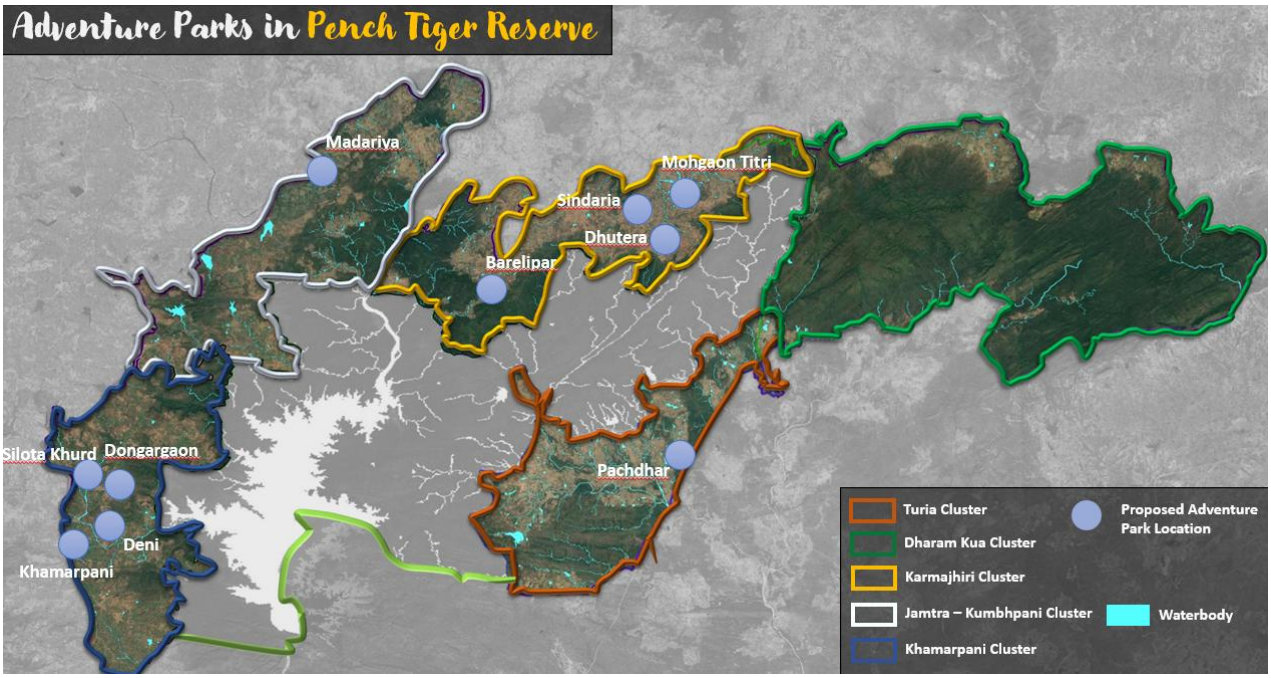


Table 5- 8 : Proposed Adventure activities and required infrastructure

Sr No.	Location	Adventure Activities	Tourism Infrastructure
1	Khamarpani, Silota Khurd, Deni, Dongargaon	Adventure Activities like commando net, gearing wall, paintwall gun, free fall, multi vine, ladder climbing etc	Tourist Lounge with Waiting area, reception, and Ticket counter. Changing Rooms, Rest Rooms, Toilets, Bathrooms, Food Kiosks
2	Madariya	Adventure activities hot air ballooning, archery, Burma bridge Mirror House, Human slingshot etc.	
3	Barelipar, Sindariya,Dhutera, Mohgaon Titri	Adventure Activities like commando net, gearing wall, paintwall gun, free fall, multi vine, ladder climbing etc.	
4	Konapindarai, Banskheda, Dawajhir, Kohka	Water Sports based adventure activities	

Sr No.	Location	Adventure Activities	Tourism Infrastructure
5	Pachhdhar	Rural Games, Tourism related adventure activities	

All kind of adventure activities to be promoted in adventure zones after feasibility study and Environment Impact assessment. Permission should be taken from respective authority for adventure activities in adventure zone of Pench Tiger Reserve.

1.2.5.3.5 Rural Tourism

Rural tourism is distinctive to its locality; the foods, products and landscapes have been shaped by generations, providing opportunities to create authentic appealing experiences for visitors that allow local communities to celebrate and take pride in their culture. Developing rural tourism products and experiences for visitors that are based on natural assets, for example wildlife, provides a potential business opportunity. Tourism in rural areas creates employment and opportunities for business growth where other opportunities may be limited, as well as maintaining and protecting existing jobs, micro businesses and those self-employed in rural areas. Rural products can be brought alive using new interpretation techniques to attract and meet the expectations of new and existing audiences.

Benefits of Rural Tourism can be as rural tourism helps to garner knowledge on agriculture, farming, local governance, etc. Rural tourism also helps to remove myths about rural lifestyle that may exist in urban minds like villages are unhygienic, rural life is unsafe, etc. and it will help tourists to explore the vast diversity that breathe in the interiors of Rural India.

Figure 5- 24 : Proposed Rural Tourism

Rural tourism experiences includes walking; adventure sports; sightseeing and visiting villages; farm shops; cycling; river boating; camping and caravanning, horse-riding; nature; bird watching; painting; arts and crafts; music and dance; literary, drama and music festivals; conservation holidays; museums; enjoying food, drink and accommodation in rural locations.

Required infrastructure for Rural tourism includes farms; agriculture; waterways (rivers); market villages; the natural environment, including lakes, woodlands, mountains, hills, , wildlife habitats and geological sites, including nature reserves and dark sky reserves, air quality, tranquility, biodiversity; rural tourism businesses, attractions,holiday parks, hotels, caravan and camping sites and other accommodation; rural transport and infrastructure (bus, rail and boat services; public footpaths and rights of way, bridleways, national trails and cycle paths).

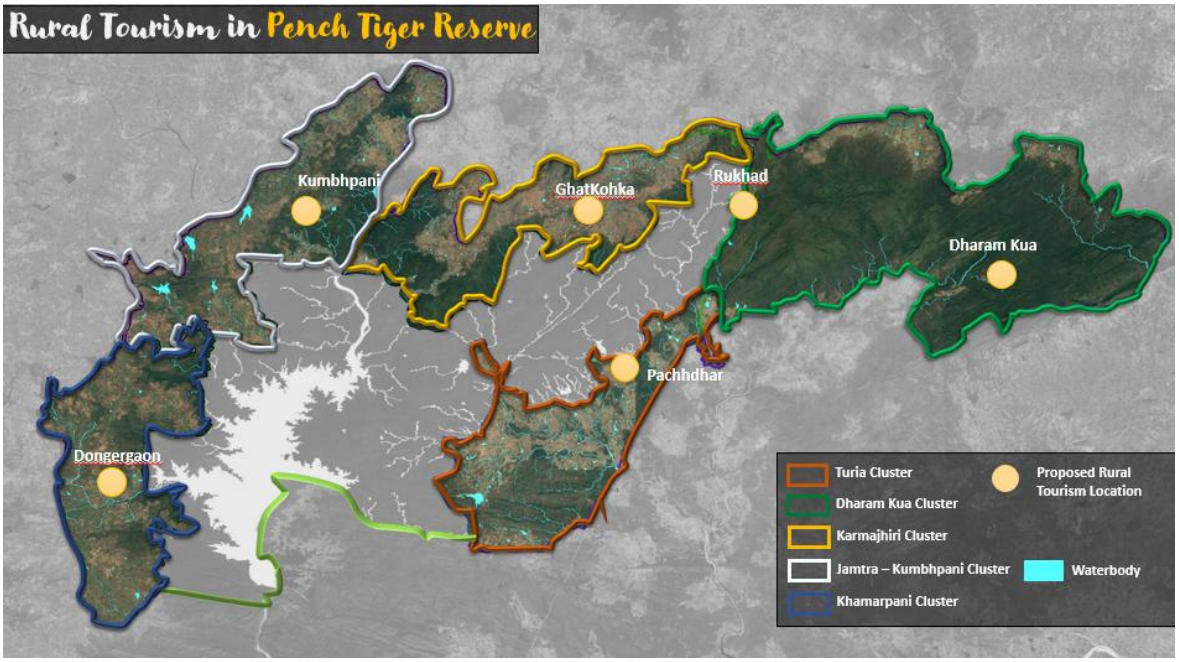


Figure 5- 25: Proposed Rural Tourism

1.2.5.3.6 Late Evening Safari

Late evening safari is a romanticizes experience with dense forest in Late evening. Late evening Safari is ongoing in Pench Tiger Reserve in areas of Telia Buffer. Late Evening safari timings are from 5.30 PM to 9.00 PM. The proposed Late Evening safari addition to these are in Kumbhpani Safari route, Rukhad Safari routes and Dharam Kua Safari Routes. These areas can provide the rich experience of wildlife as well as forest under the starry dark nights. The rules and regulations will be decided by the Pench Tiger Reserve.

Star Gazing

Eco-Sensitive Zone of Pench Tiger Reserve has the maximum amount of forest and only 2 urban centers in the area. These leads to minimum amount of usage of lights and availability of clear visibility of dark sky with minimum disturbances. There is availability of dark sky maximum time of the year.
The proposed locations for stargazing are Dharam Kua, Kuraigarh, Rukhad, Turia, Karmajhiri, Jamtra, Pulpuldoah, Ambamai Temple and Mahadeo Kholi are provides the beautiful landscape view of Pench Range along with Late evening sky. Telia, Rukhad and Dharam Kua are the part of Safari, which provides the wildlife experience as well as jungle Late evening safari along with stargazing. Mahadeo Kholi is in the lap of Mountain Range, provides the direct touch with nature and camping along with stargazing.
Required equipment for the stargazing should be provided at respective locations or in Late evening safari locations.

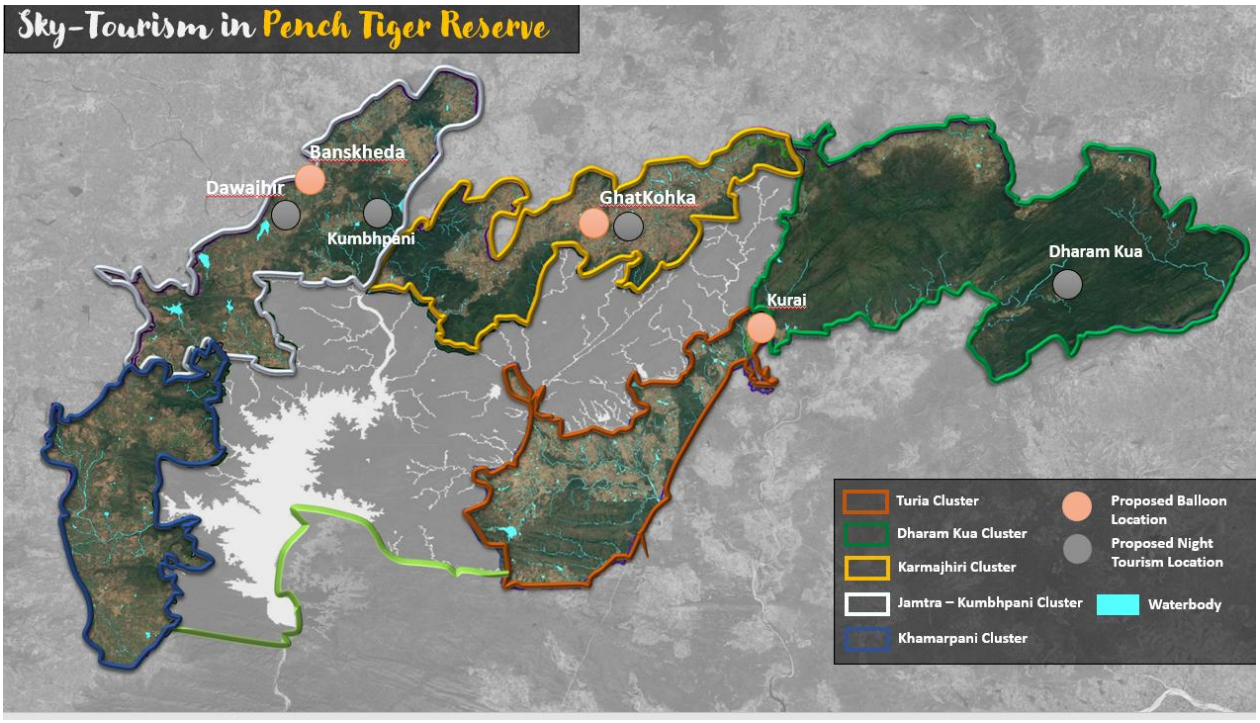


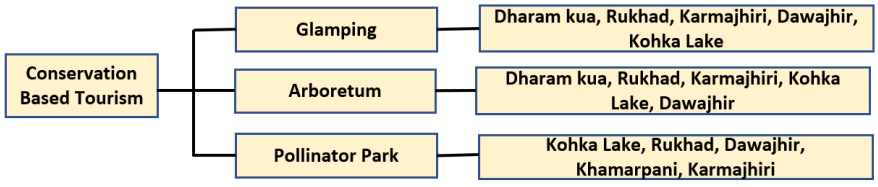
Figure 5- 26: Proposed Sky Tourism

1.2.5.3.7 Hot air Balloon Tourism

Pench Tiger Reserve has almost flat terrain in the Eco-Sensitive Area. But it has combination of dense and open forests, which leads to diversification of the landscapes on flat terrain. To experience the forest and environment from up above sky, a hot air balloon is proposed in the Pench Tiger Reserve. This ride can provide variety of experience to the tourists in and beyond eco-sensitive zone area. With a hot air balloon ride tourist will be able to explore the unseen gems of National Park at its resplendent best. An aerial view of the restricted buffer zone and protected area zone will be an exclusive experience for the safari lovers.

The ride will be at heights of 2000 to 4000 ft and for an hour of duration. The feasibility study of the same to be carried out before implementation of the activity.

1.2.5.4 Conservation based Tourism



Conservation based tourism proposed for enhancing the balance with environment. The purpose of the promoting these activities is to increase awareness about forest and its natural cycles among the tourists.

Pench Tiger Reserve has the rich forest area in Eco-Sensitive zone. Some of the area has degrades to wastelands, agriculture land and other usages. Tourism increases biotic pressure on the region. To tackle those pressure, conservation-based tourism has been introduced to Pench Tiger Reserve. This concept can be helpful to flourish the flora fauna of the region and also helpful to create habitat for some of the species. With proper landscape development and conservation, it may attract the researchers as well as

tourists in the region. With having multi-purpose usage, it creates the win-win situation for environment and development both.

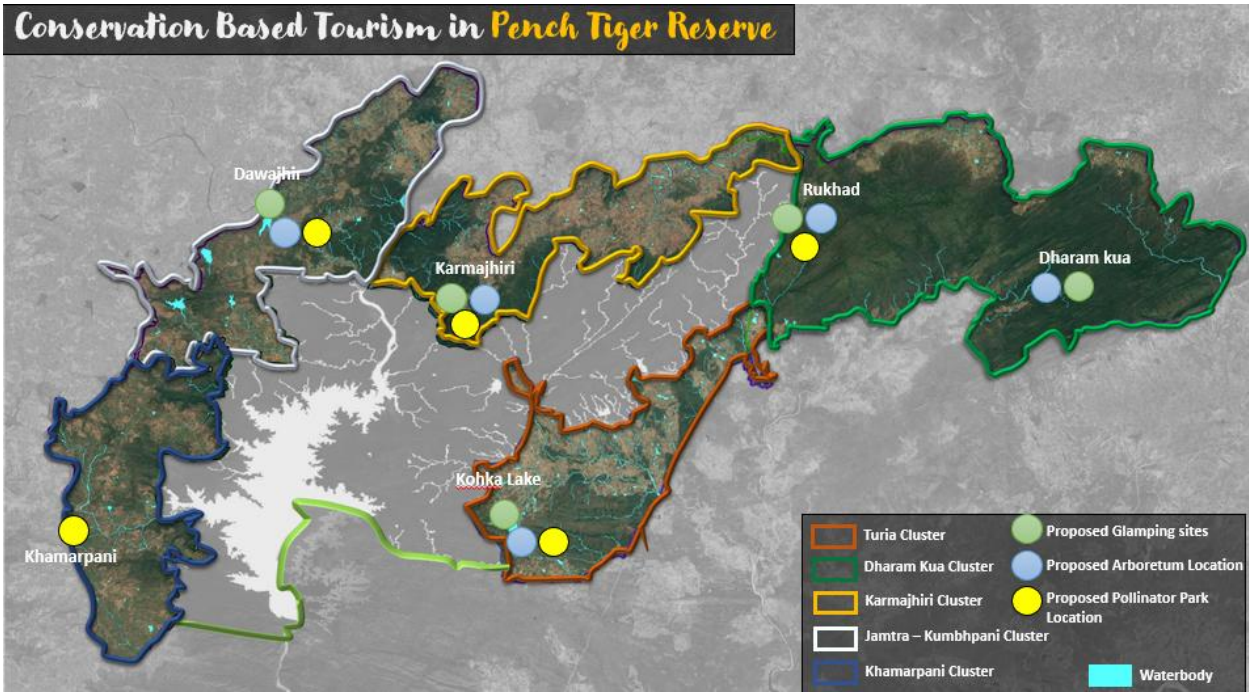


Figure 5- 28: Proposed Conservation based Tourism

1.2.5.4.1 Glamping

Glamping is an ecological, glamorous and innovative concept within the nature tourism category, which aims to awaken the senses of its visitors, in full integration with the surrounding environment. Glamping can be described as outdoor camping with amenities and comforts (such as beds, electricity, and other sanitary infrastructures). Glamping provides experience of an outdoor escape that combines the closeness to nature associated with camping with the luxury and convenience of proper self-catered accommodation. These glamping structures can be suspended in the air, over outcroppings or set on the ground. Cubes, pods and domes represent a very unique category in the glamping industry. Normally cubes, pods and domes are a single room structure that is either completely round or square. Examples of glamping is as below images.

Figure 5- 29: Sample of Glamping activities

As mentioned in notification S.O. 4009(E), no construction is allowed for commercial activities within 1 km from protected area of PTR. There are approximately 18 resorts in Turia cluster which falls under 1 km zone. The Glamping is the similar form of camping, but built with eco-friendly materials, without using

concrete and other hazardous material. The glamping can be developed under 1 km zone of no construction for commercial purpose. Glamping is allowed on proposed Eco-Tourism area.

1.2.5.4.2 Arboretum

An Arboretum is an area devoted to specimen plantings of trees and shrubs. Distinct from a forest, nursery or park, it is in a sense an outdoor museum of trees. It is a place where many varieties of trees are grown for research, educational, and ornamental purposes, where trees and shrubs are cultivated for exhibition.

1.2.5.4.3 Pollinator Park

A pollinator garden is a garden that is planted predominately with flowers that provide nectar or pollen for a wide range of pollinating insects. A pollinator garden can be any size ranging from a small yard to big farms. It does not require exclusive planting policy. There may be other flowers that suitable to grow in region, but the majority of flowers in a pollinator garden should be specifically chosen as per support to pollinators. In this, Birds and insects both can be pollinators which can leads to from habitat for birds also.

Figure 5- 30: Pollinator Parks and activities

In pollinator park following things shall be included:

1. Many pollinating insects can only exploit particular shapes or sizes of flowers. To support pollinator diversity, it must cater for all shapes and sizes of insect mouthparts.
2. Plantation must be done during sunny/ summertime of the year because insects need the sun's warmth to help them stay active.
3. Use flowering hedges, or hedges of native hedgerow shrubs. These will create warm 'micro-habitats' within the garden. Hedges are better than fences at protecting gardens from wind.
4. Avoid planting particular species only. This may lead to locating and exploiting that resource.
5. Plan as per long growing seasons and some types of pollinating insects manage to breed two or more generations to achieve success.
6. Minimize or eliminate use of pesticides and use well known organic methods to control the hazardous elements. i.e. birds can control some of hazardous insects.

These pollinators parks with proper landscapes and variety of species can be used as the tourist attractions. These parks can be developed alongside with resorts, parks and museums or other amenities.

1.2.5.5 Low Impact Tourism Activities

Low-impact tourism activities are designed to minimize environmental damage and promote sustainable travel, especially in sensitive areas like Eco-Sensitive Zones (ESZ) in India. These zones are designated to protect and conserve biodiversity, wildlife habitats, and ecosystems around national parks, wildlife sanctuaries, and protected areas. Below are some key low-impact tourism activities suitable for these areas, along with references:

List of Low Impact Tourism Activities

Nature Walks and Birdwatching **Activity:** Guided walks through forests or grasslands, focusing on observing flora and fauna without disturbing the habitat. **Benefit:** Provides educational value, promotes awareness, and minimizes human impact on the environment **Example:** In the **Western Ghats** (an ESZ), birdwatching and nature walks attract ecotourists while ensuring minimal disturbance to wildlife.	
Camping (Low-Impact, Eco-Friendly) **Activity:** Setting up temporary, environmentally friendly campsites using biodegradable materials and following strict waste management practices. **Benefit:** Allows tourists to experience nature up close while maintaining a low environmental footprint. **Example: Nanda Devi Biosphere Reserve**, an ESZ, permits eco-friendly camping in designated areas with strict guidelines	
Cultural Tourism and Heritage Walks **Activity:** Promoting local culture, traditions, and history through guided tours of villages or towns around protected areas. **Benefit:** Supports local communities and raises awareness of cultural heritage while having a minimal environmental impact. **Example: Sundarbans Reserve Forest ESZ**, where cultural tourism initiatives focus on the heritage of the local communities and their relationship with the environment.	

Wildlife Photography (Non-Intrusive) **Activity:** Encouraging visitors to engage in wildlife photography with a focus on ethical practices, such as not disturbing the animals or their habitats. **Benefit:** Raises awareness and funds for conservation efforts. **Example: Kaziranga National Park**, an ESZ, allows wildlife photography, provided that tourists adhere to strict guidelines to avoid disturbing the animals.	
5. Sustainable Agriculture Tourism (Agro-Tourism) **Activity:** Visitors participate in sustainable farming practices and experience rural life, often around the fringes of ESZs, where agriculture coexists with natural conservation. **Benefit:** Promotes sustainable livelihoods for local farmers and raises awareness about eco-friendly agricultural practices. **Example: Ranthambore National Park**, where agro-tourism projects focus on sustainable farming practices	
River Rafting and Canoeing (Eco-Friendly) **Activity:** Conducting river rafting or canoeing in a manner that ensures minimal environmental impact on water bodies and surrounding ecosystems. **Benefit:** Encourages appreciation of rivers and conservation while avoiding disruptions to aquatic life. **Example: Teesta River** in Sikkim, near an ESZ, offers rafting that is closely regulated to avoid harming riverine ecosystems.	

Herb and Medicinal Plant Tours **Activity:** Guided tours focusing on the identification and conservation of medicinal plants and herbs, which can be sustainable if done correctly. **Benefit:** Promotes knowledge of biodiversity and local flora while ensuring conservation efforts. **Example: Kedarnath Wildlife Sanctuary**, an ESZ area, is home to several medicinal plants that are part of responsible eco-tours	

`**Key Principles for Low-Impact Tourism in Eco-Sensitive Zones:**

- **Minimal Intervention:** Activities should not disturb wildlife, vegetation, or ecosystems.
- **Sustainability:** Tours should be designed to ensure long-term sustainability, involving local communities and conserving natural resources.
- **Environmental Education:** Visitors should be educated about the importance of protecting the environment and wildlife.
- **Regulations and Monitoring:** Strict adherence to environmental guidelines and monitoring of tourism activities is essential to prevent over-tourism.

1.2.5.6 Conservation of Heritage Sites

In Pench Tiger Reserve, there is absence of historic / ASI notified sites in Eco-Sensitive Zone area. Though there is a memorial which is called 'Shahid Smarak' in remembrance of the contribution of Tribal communities in freedom movement of India. This site has presence of some of instruments/ weapons which was used during that era. This needs to be conserved properly under monitoring of central or state level agencies. Apart from that, a mythological place named Kuraigarh in Rukhad Range is said to be first castle of the Gond King. The local people believe that there is a fort underneath mountain and some of remaining of the castle can be observed on site. The site need to be examined by respective authority for the facts. If needed, it shall also be conserved by respective state / centre level authorities.

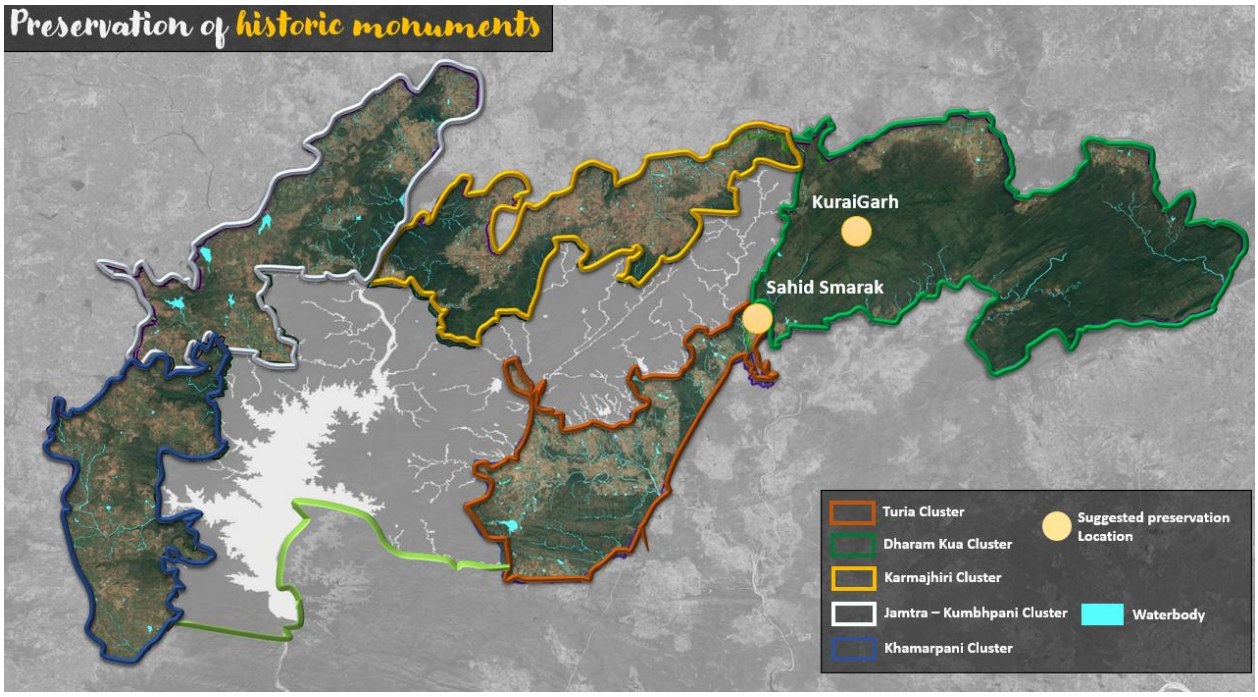
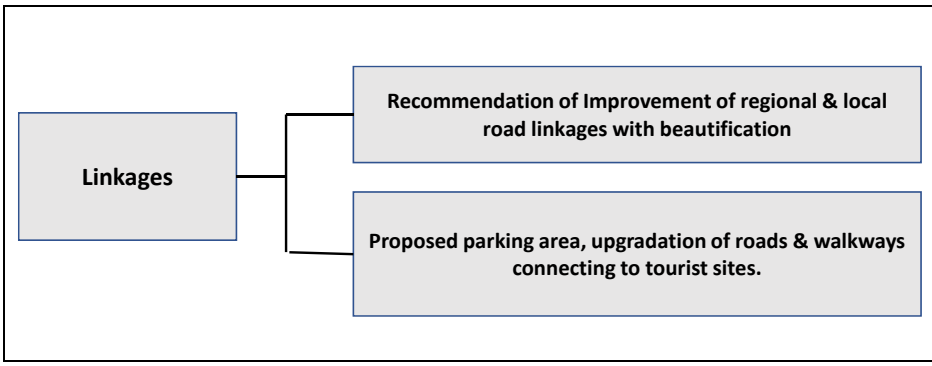


Figure 5- 31: Potential sites for preservation in PTR

1.2.5.7 Connectivity Linkages



Linkages are proposed on regional as well as local level to provide better connectivity in PTR. A circuit route is proposed in PTR to provide connectivity to villages as well as tourism sites.

Figure 5- 32: Connectivity Linkages

Figure 5- 33: Existing Situation of Roads

Figure 5- 34: Proposed Roads

Figure 5- 35: Beautification of Roadside

Statues and artwork as per suitability to area can be developed at entrance of roads of Pench Tiger Reserve and tourism sites. These artworks can promote the unique identity of area with providing elegance to the roads.

Sculpture related to the Jungle Book can be helpful to promote the area at larger extent.

Figure 5- 36: XXXXX

Cultural Monuments and Stories can be part of roadside beautification in Rural tourism cluster. These can lead to increase curiosity in culture of the tribal lands.

The monuments related the Andolans in forest can be designed alongside roads for tourists to acknowledge the history of area. This can be helpful to attach tourist with the area and intensify curiosity about the area.

1.2.5.7.1 Walkway

Not all the sites in PTR are accessible by the roads only. The walkways can be developed as follow:

Paved walkway to sites is preferable for access tourism sites to parking distance.

Figure 5- 37: Walkway

Street Food is essential part of recreation experience. The food street market is proposed at Kohka and Dawajhir Lake to complete the recreational activities. Food vans are permitted in market with having proper chair and table facility in area.

Figure 5- 38: Food Street/ Food Market

Kohka lake and Dawajhir lake can be developed as lake front development walkway like this to attract the tourists. (Working Plan, PTR 2025) The walkway for the dam can be developed with usage of climbers like Bougainvillea, Blue Morning glory, star Jasmine, flame vine and many more. An attractive sculpture of characteristics of the Jungle Book can also be provided for attraction to the dam.

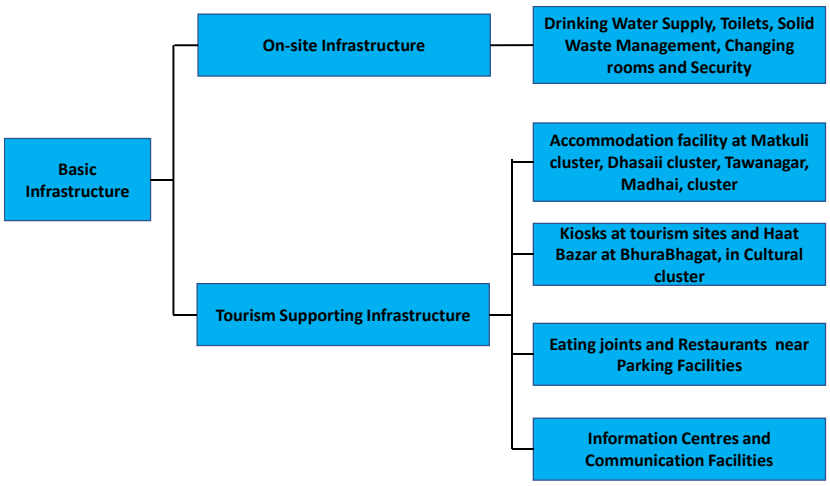
1.2.5.8 Existing Tourist Carrying Capacity

There is total 6 safaris in Pench Tiger Reserve, 3 safaris are from protected area and 3 safaris are in buffer zone. The protected area includes Turia Gate, Karmajhiri Gate and Jamtra Gate. The buffer zone has Rukhad gate, Telia Gate and Kumbhpani Safari. The carrying safari for existing safaris are as below table. (Working Plan, PTR 2025)

Table 5- 9 : Existing Carrying capacities for Pench Tiger Reserve

Sr No	Area of wildlife Safari	Existing Wildlife Safari	Number of Vehicles as per Carrying Capacity
1	Protected Area	Turia Safari	74
2		Karmajhir Safari	16
3		Jamtra Safari	9
4	Buffer Area	Telia - Khawasa	127
5		Rukhad – Masoor nala	68
6		Kumbhpani - Tikadi	39

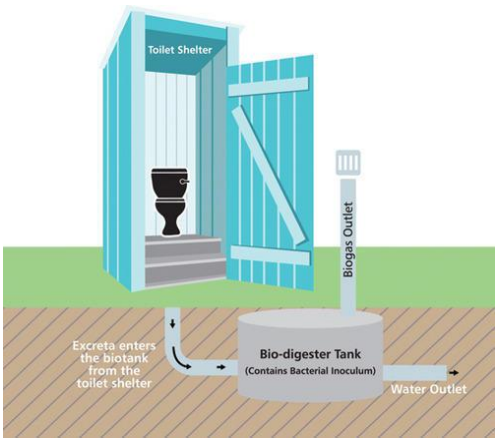
1.2.5.9 Infrastructure



Infrastructure helps to develop tourism sites for tourists. Water stands, toilets, dustbins and security are the basic proposed on-site infrastructure. Supporting infrastructure are accommodation, parking and food kiosks and food streets.

Figure 5- 40: INFRASTRUCTURE

1.2.5.9.1 On site Infrastructure



E-Toilet or Bio-Toilet with one wash basin provided at each refreshment point and at Entry gates of safari.

The bio toilet can be devloped as shown in Image with having bio-digest tank at bottom.

Figure 5- 41: Toilets

Water fountains and water stand posts should be provided at each refreshment point and entry gates of safari.

Stand posts with five water tap is proposed. Each stand post has its water storage and pipe connectivity.

Figure 5- 42: Water Infrastructure

Signages

Signage will be helpful for the people to reach their destinations and easily return from their destination to the respective places. Proper signage on regional routes and town roads should be provided on every major junctions of road. Tourist maps showing location and importance of tourist sites should be placed at important locations. Signages to be provided to Safaris, Nature Trails and on linkage roads of tourist destinations.

Figure 5- 43: Signages

Dustbins with segregation should be provided on tourism sites and a facility to collect and dump the wastage to be developed by the village authorities. A plastic bottle vending machine can be put on site to reduce and segregate plastic waste.

Figure 5- 44: Dustbins

Changing rooms should be provided at waterfalls and pools site as well as recreational and adventure zone sites.

Figure 5- 45: Changing Rooms

1.2.5.9.2 Tourism Supportive Infrastructure

Accommodation

The accommodation in Pench is concentrated on Turia Gate, which surpasses additional carrying capacity of the region. The proposed accommodation is as per below figure.

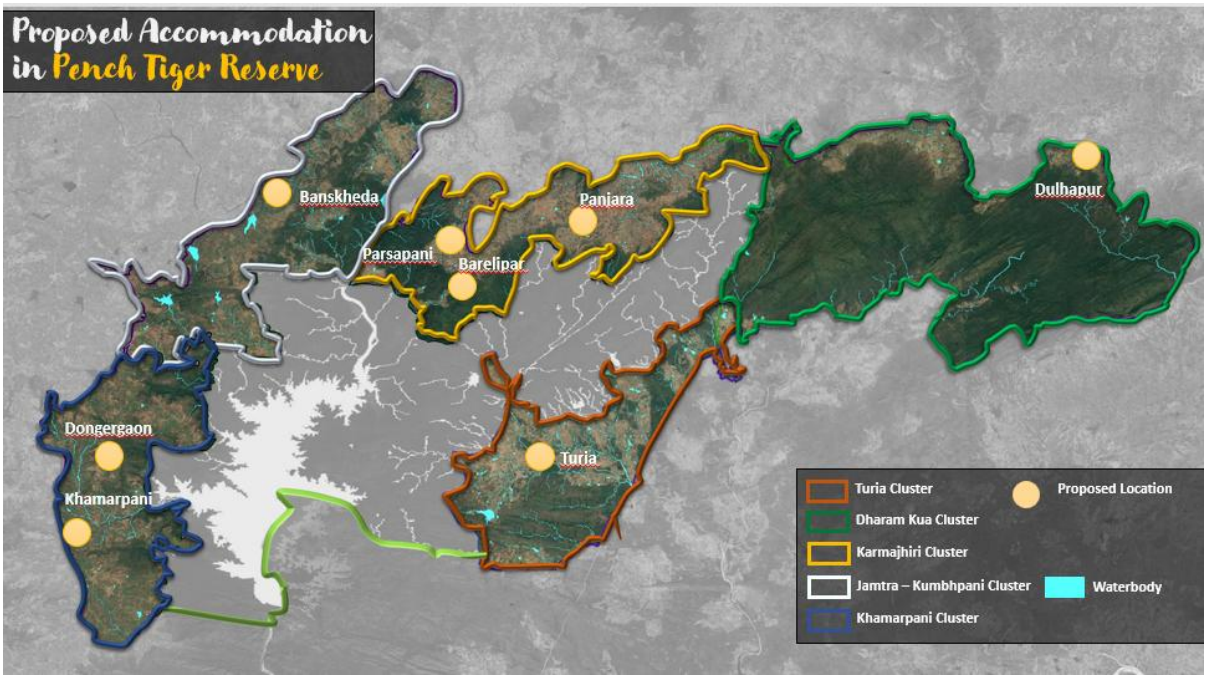


Figure 5- 46: Proposed Accommodation in PTR

Table 5- 10 : Proposed tourism infrastructure Facilities in PTR

Sr.No.	Proposed Tourism Activities	Suggested Tourism infrastructure Facilities
1	Wild-life Safari Dharam Kua Safari (approx. 46 km)	• Tourist Lounge with Waiting area, reception and Ticket counter. • Rest Rooms • Toilets & Bathrooms • Food Kiosks • Water Stand posts
2	Nature Walk i. Naharjhir to Ambamai ii. Mahadeo Kholi iii. Kumbhapani iv. Rukhad to Ussekatta v. Tikadi Mal	• Barriers • Toilets • Water Stand Posts
3	Adventure Zones i. Khamarpani ii. Dongergaon iii. Deni iv. Silota Khurd v. Madariya vi. Barelipar vii. Dhutera viii. Sindaria ix. Mohgaon Titri x. Pachdhar	• Tourist Louge with Waiting area, reception and Ticket Counter • Rest Rooms • Toilets & Bathrooms • Food Kiosks • Water Stand posts

Sr.No.	Proposed Tourism Activities	Suggested Tourism infrastructure Facilities
4	Hot Air Ballon Tourism i. Banskheda ii. Ghatkohka iii. Kurai	• Landing Gears • Safety Equipment's • Fire Safety equipment's
5	Camping Sites i. Pulpuldoah ii. Marjatpur iii. Kokiwara iv. Singardeep v. Kumbhpani vi. Tikari Mal vii. Ghatkohka viii. Mohgaon Titri ix. Dudhia Lake x. Turia xi. Kohka xii. Dharam Kua	• Tourist Lounge with Waiting area, reception, and Ticket counter. • Rest Rooms • Toilets & Bathrooms • Food Kiosks • Kitchen • Dining • Auditorium • Activity Areas
6	Rural Tourism i. Dongergaon ii. Kumbhapani iii. Ghatkohka iv. Rukhad v. Dharam Kua vi. Pachhdhar	• Tourist Lounge with Waiting area, reception, and Ticket counter. • Toilets & Water Facilities • Food Kiosks
7	Stargazing at : i. Dawajhir ii. Kumbhpani iii. Ghatkohka iv. Dharam Kua	• Tourist Lounge with Waiting area, reception, and Ticket counter. • Toilets & Water Facilities • Storage for devices for stargazing devices
8	Glamping i. Dawajhir ii. Karmajhiri iii. Rukhad iv. Dharam Kua v. Kohka	• Tourist Lounge with Waiting area, reception, and Ticket counter. • Toilets & Water Facilities

1.2.5.10 Promotion of Tourism in PTR

Tourism promotion means trying to encourage the actual and potential customers to travel a destination through the spreading of information. Promotion in tourism helps to draw the attention of the potential tourists, modify the behaviour of the existing buyers and influence them to visit a destination. In strategies, First need is to develop brand identity to develop the tourism in regions. Turia is the brand image of Pench Tiger Reserve. It should be associated with other destinations and travel advertisements. The need for coordination of industry promotional material should be recognized and promotion should be done

through various mediums. The importance of experiences to tourists should be involved in promotion of tourism in PTR. Local residents and local businesses should be involved in promotion. This will lead to get beneficial for both as tourism increases. A proper Tourism proposal plan linked with national as well as state plan to be prepared for PTR. The tourism in PTR can be promoted in following way:

1.2.5.10.1 Advertisements

Advertisement is any type of paid mode of non-personal presentation and promotion of ideas, goods, or services by an identified sponsor. In the context of place marketers, purchase of advertisement in form of magazine, newspaper or other forms of advertising. Within the sphere of advertising, public advertising is most promising way of communication. Further, it is argued that a place and its products receive more attention as country of origin effectively assists in communicating the value of a product. Among the variables of advertising vehicles include, advertising through media television, radio, magazines, newspapers, brochures, billboards (outdoor), internet, social media direct mails and so forth. Decision of suitable mode of advertisement, depends with the objective and budget of the concerned marketer. Usually television is the most effective mode of advertisement despite its high cost. In addition to the State Governments efforts to advertise due to proliferation public/private media, tourism promotion has become an important element 24/7 telecast channels.

1.2.5.10.2 Experience based promotions

Digital platform is the best way to express the experience. Various digital platforms like YouTube, Facebook, and many more can be used for promotion of tourism in PTR via experience. One of the best ways to generate this online presence is through blogger outreach. By hosting bloggers and vloggers in tourist destination trips can promote tourism industry on the internet with articles and hashtags on social media as well as video vlogs on YouTube and other platforms. Pench has presence of many tribes with cultural stories and mythological tales. This content can be promoted via digital platform with short films, TV series and film with inclusion of cultural tales. The shooting for movies, digital contents and advertisements should be subsidies as it indirectly promotes tourism in regions.

1.2.5.10.3 Promoting through Trainings, Exhibitions and Gatherings

Kurai has potential to be developed for various training centers like teacher's training centers, forest training centers and army training centers. These training programs like training, Exhibitions and gatherings can promote the awareness about the area and its tourism destinations. Destination Weddings should be promoted in area in resorts and cottages. National level exhibitions can be organized in various area of Pench to promote the local areas.

1.2.6 RESEARCH, MONITORING AND TRAINING

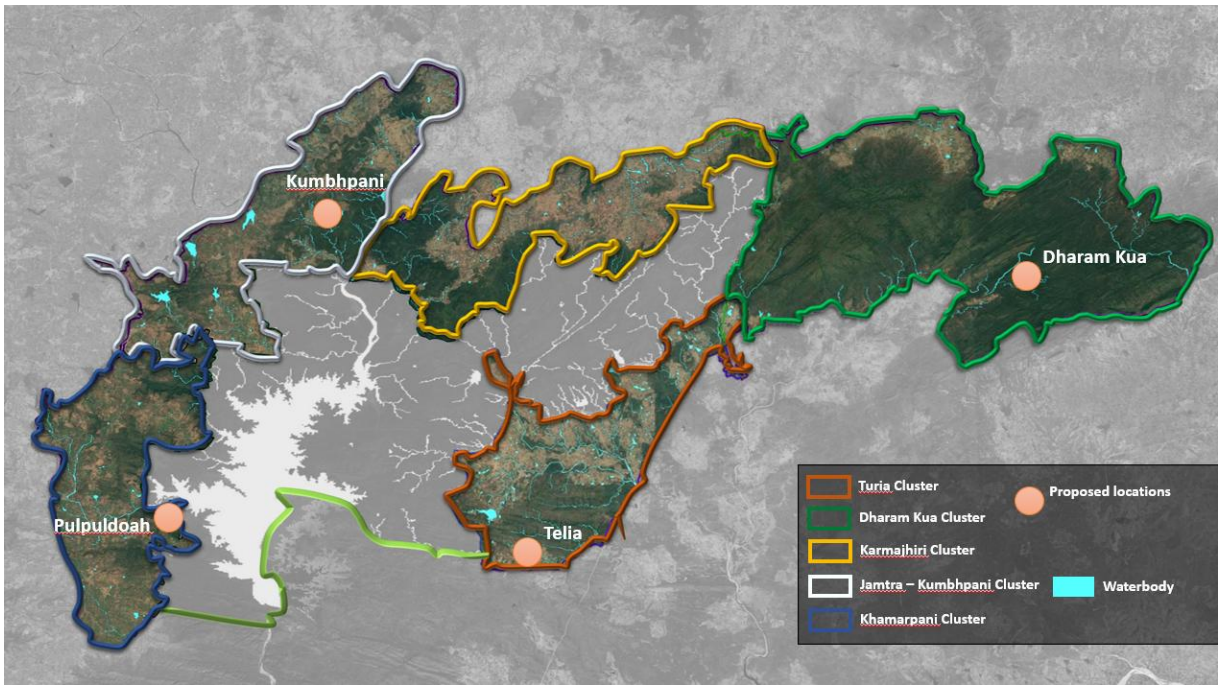


Figure 6- 1: Proposed tentative research area locations

Table 6- 1: Proposed Trainings

Sr No	Sector	Proposed Training
1	Tourism	Etiquette, Behavior Skills, Communication and Public Relation
		Tourist Destination and History
		Marketing and Promotion
		Safety related trainings
		Event Organization and Management
		Tourism Infrastructure Maintenance & Management
2	Conservation	Identification, knowledge and importance of species of flora and fauna
		Eco-friendly construction and management practices
		Ground water recharge and management
		Soil conservation techniques
		Water utilization and conservation techniques
3	Economy	Tasar silk Farming and Development
		Organic Farming
		Farmers awareness and training
		Skill Development and vocational Programs (Automotive, Electrical and Electronics, Mechanical and maintenance and many more)

Sr No	Sector	Proposed Training
		Skill development for art and craft
		Animal husbandry and Poultry farming
		MFP value addition and marketing
4	Infrastructure	Management and maintenance of Infrastructure
		Management and maintenance of Biogas and Solar plants

1.2.7 PERMISSIONS, ORGANIZATION AND ADMINISTRATION

Table 7- 1 :List of Regulatory activities under Regulatory Authority

Sl.No	Regulated Activities	Regulatory Authority
1	Commercial establishment of hotels and resorts	Revenue Department, Forest Department and Local Body
2	Construction activities	Revenue Department, Forest Department and Local Body
3	Small scale non polluting industries	Revenue Department, Forest Department and Local Body
4	Comercial Goat and sheep farming	Revenue Department, Forest Department and Local Body
5	Felling of Trees	Revenue Department, Local Body and Forest Department
6	Goat Farming	Local Body and Forest Department
7	Collection of Forest Produce or Non-Timber Forest Produce (NTFP)	Local Body and Forest Department
8	Migratory graziers	Local Body and Forest Department
9	Erection of Electrical and communication towers and laying of cables and other infrasrtucture	Revenue Department, Local Body, Forest Department and DISCOM
10	Infrastructure including civic amenities	Revenue Department, Forest Department and Local Body
11	Widening and Strengthening of existing roads and construction of new roads	Revenue Department, Forest Department and Local Body
12	Undertaking other activities related to tourism lie over flying the ESZ area by hot air balloon, drones , microlites	Revenue Department, Forest Department and Local Body
13	Protection of Hill slopes and river banks	Local body, Forest Department and Collector
14	Movement of Vehicular Traffic at night	Local body , Forest Department
15	Ongoing agriculture and horticulture practices by local communities along with dairies , dairy farming, acquaculture and Fisheries	Local Body
16	Discharge of treated waste water /effluents in natural water bodies or land area	Local Body, Forest Department and MPPCB
17	Commercial extraction of surface and ground water	Local Body,WRD,CGWA, Collector
18	Open well, Bore well etc for agriculture or other Usage	Local body and Collector
19	Solid Waste Management/Bionmedical Waste Managament	Local Body., CMHO,MPPCB, Health Department
20	Introduction of Exotic Species	Local Body, Collector, Forest Department
21	Eco-Tourism	Local Body, Tourism Department, Forest Department

22	Commercial Sign boards and hoardings	Local Body, Transport Department, Forest Department
23	Noise Pollution	Local Body, MPPCB and district administration

Source: Inter-state departmental meeting

1.2.7.1 Monitoring Committee

Table 7- 2: Monitoring Committee

1.	Divisional Commissioner, Jabalpur	Chairman;
2.	Field Director, Pench Tiger Reserve	Member Secretary;
3.	Representative of the Pollution Control Board	Member;
4.	One representative of Non-Governmental Organization working in the field of environment to be nominated by the Government of Madhya Pradesh for a term of three years in each case	Member;
5.	One expert in the area of ecology and environment from a reputed institution of University in the State to be nominated by the Government of Madhya Pradesh for a term of three years in each case	Member;
6.	Member, State Biodiversity Board	Member;

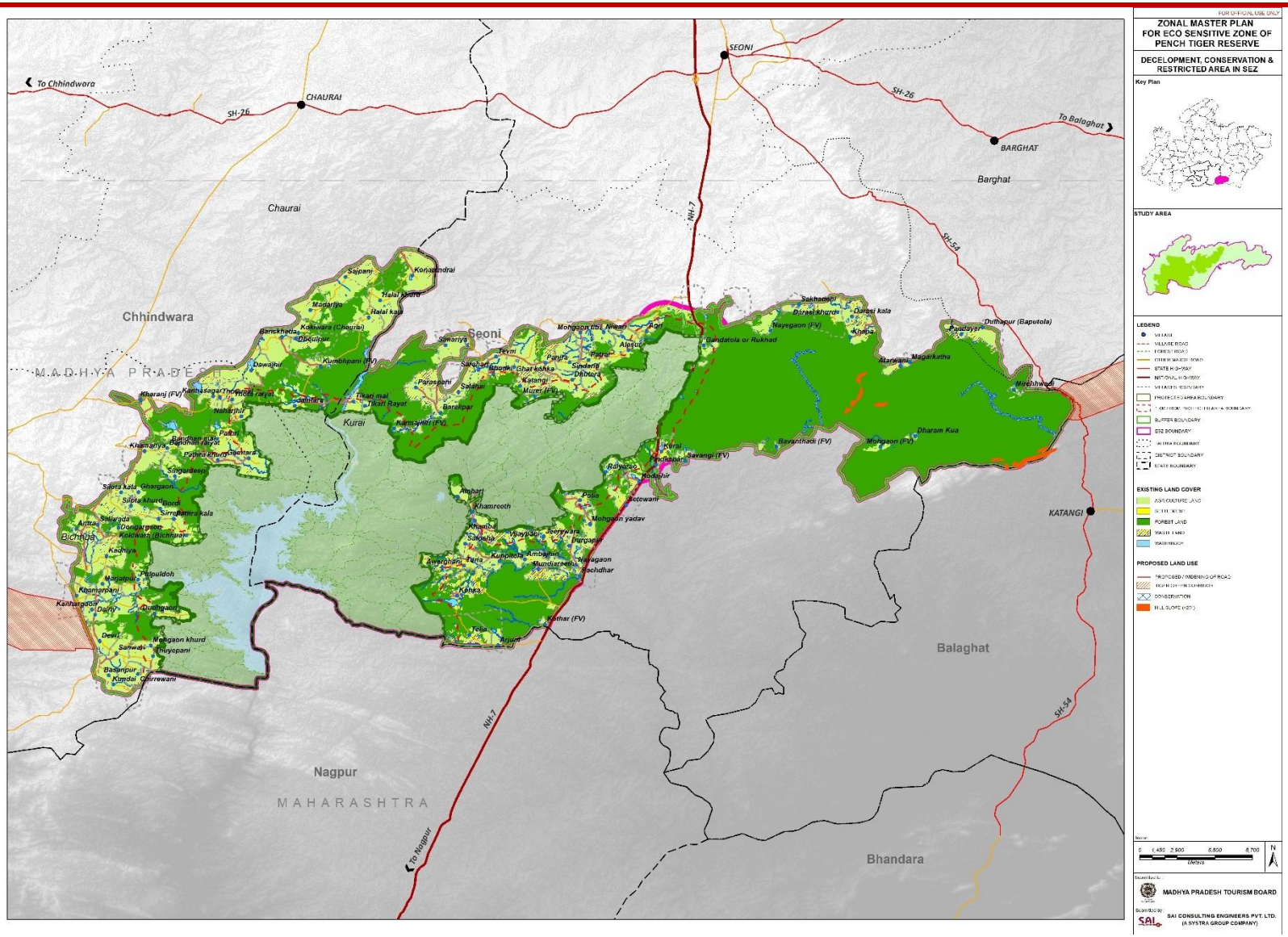


Figure 7- 1: Development, Conservation and Restricted Areas in ESZ

1.2.8 Phasing and Resource Mobilization

1.2.8.1 Phase wise Priority of proposals

Approach for cluster-based proposals in Zonal Master Plan for Eco-Sensitive Zone of Pench Tiger Reserve is considered due to large extent of the area. Total Eco-sensitive Zone area is divided in 14 clusters as per their natural boundaries, characteristics, livelihood and many other factors for proposed development activities like tourism, livelihood and conservation proposals. In below section, the priorities for the proposals are provided in short term (0-7 years), Medium term (7-14 years) and long term (more than 14 years). The priority for the same is suggested with consideration of following parameters:

1. Existing importance of area (i.e. tourism, livelihood activities, etc.)
2. Available infrastructure
3. Potential for development and need of conservation measures
4. Inter-dependencies of the proposals

1.2.8.1.1 Phasing interventions for tourism activities

ESZ of PTR has vast opportunities for the tourism. The priorities for tourism activities are decided based on the existing tourism activities, infrastructure, and potential for development. All activities inside forest areas (both under Buffer and under Revenue) will be done as per FCA activities and as per Working plan /TCP. The brief phasing for the activities are as below table.

Table 8- 1: Phasing interventions for tourism activities

Proposed Activities	Cluster	Location	Priority wise Phasing		
			Short Term	Medium Term	Long term
Wildlife Safari	Dharam Kua	Dharam Kua			
	Dharam Kua	Masoor Nala			
Nature Trails	Dharam Kua	Naharjhir to Amba mata Temple			
	Dharam Kua	Mahadeo Kholi			
	Jamtra - Kumbhpani	Kumbhpani			
	Dharam Kua	Rukhad to Ussekatta			
	Karmajhiri	Tikadi Mal			
Camping	Dharam Kua	Dharam Kua			
	Dharam Kua	Dudhia Lake			
	Turia	Kohka			
	Turia	Turia			
	Karmajhiri	Mohgaon Titri			
	Karmajhiri	Ghatkohka			
	Karmajhiri	Tikari Mal			
	Jamtra - Kumbhpani	Kumbhpani			
	Jamtra - Kumbhpani	Dawajhir			
	Jamtra - Kumbhpani	Singardeep			
	Khamarpani	Kokiwara			
	Khamarpani	Dongergaon			
	Khamarpani	Marjatpur			
	Khamarpani	Pulpuldoah			

Proposed Activities	Cluster	Location	Priority wise Phasing		
			Short Term	Medium Term	Long term
Adventure Activities					
Mountain Cycling and Mountain adventure activities	Turia	Pachhdhar			
Adventure activities hot air ballooning, archery, Burma bridge Mirror House, Human slingshot etc.	Karmajhiri	Mohgaon Titri			
Adventure Activities like commando net, gearing wall, paint wall gun, free fall, multi vine, ladder climbing etc.	Karmajhiri	Sindaria			
	Karmajhiri	Dhutera			
	Jamtra - Kumbhpani	Dawajhir			
	Khamarpani	Silota Khurd			
	Khamarpani	Dongergaon			
	Khamarpani	Deni			
	Khamarpani	Khamarpani			
ATV riding, Mountain based adventure activities	Karmajhiri	Barelipar			
ATV riding, Mountain based adventure activities, water-based adventure activities like river rafting, bamboo canoeing and many more.	Karmajhiri	Madariya			
Hot Air Balloon	Turia	Kurai			

Proposed Activities	Cluster	Location	Priority wise Phasing		
			Short Term	Medium Term	Long term
	Karmajhiri	Ghatkohka			
	Jamtra - Kumbhpani	Banskheda			
Rural Tourism	Dharam Kua	Dharam Kua			
	Dharam Kua	Rukhad			
	Turia	Pachhdhar			
	Karmajhiri	Ghatkohka			
	Jamtra - Kumbhpani	Kumbhpani			
	Khamarpani	Dongergaon			
Late evening safari	Dharam Kua	Dharam Kua			
	Karmajhiri	Ghatkohka			
	Jamtra - Kumbhpani	Kumbhpani			
	Jamtra - Kumbhpani	Dawajhir			
Conservation based Tourism					
Conservation of Tourist Sites	Dharam Kua	Kuraigarh			
	Turia	Sahid Smarak			
Glamping	Dharam Kua	Dharam Kua			
	Dharam Kua	Rukhad			
	Karmajhiri	Karmajhiri			
	Jamtra - Kumbhpani	Dawajhir			
	Turia	Kohka Lake			
Arboretum	Dharam Kua	Dharam Kua			
	Dharam Kua	Rukhad			
	Karmajhiri	Karmajhiri			
	Jamtra - Kumbhpani	Dawajhir			
	Turia	Kohka Lake			
Pollinator Park	Turia	Kohka Lake			
	Jamtra - Kumbhpani	Dawajhir			
	Dharam Kua	Rukhad			
	Karmajhiri	Karmajhiri			
	Khamarpani	Khamarpani			

1.2.8.1.2 Phasing interventions for Development and Conservation Proposals

Development activities like livelihood through Traditional cropping, Apiculture development, Agro-forestry and various value addition for MFPs along with conservation process like ground and surface water protection, Conservation of Dark sky and many more are long term process. These activities are proposed as per the existing schemes and may take time for development. These activities are considered

as continuous development throughout all phase of Zonal Master Plan. The phasing for the activities for development and conservation are as below table.

Table 8- 2: Phasing interventions for development and conservation activities

Proposals for Infrastructure	Cluster	Location	Tentative Phasing		
			Short Term	Medium Term	Long term
Conservation Infrastructure for Traffic and Transportation					
Signages	Whole ESZ	All Notified villages			
Speed Breakers	Whole ESZ	All Notified villages			
Fencing	Whole ESZ	All Notified villages			
Wildlife Passages	Whole ESZ	All Notified villages			
Silence Zone	Whole ESZ	All Notified villages			
Protection to The Source of Water					
Surface Water	Whole ESZ	All Notified villages			
Ground Water	Whole ESZ	All Notified villages			
Rainwater Harvesting	Whole ESZ	All Notified villages			
Development of Resilience to Climate Change					
Promotion of Non-Polluting Mobility	Whole ESZ	All Notified villages			
Electric Vehicles for Safari	Turia	Telia			
	Dharam Kua	Dharam Kua and Rukhad			
	Karmajhiri	Kumbhpani			
Solar Energy	Whole ESZ	All Notified villages			
Biogas	Whole ESZ	All Notified villages			
Conservation of Night Sky	Whole ESZ	All Notified villages			
Measures for Pollution Control					
PUC Centre		Turia			
		Kurai			
		Dharam Kua			
		Ghatkohka			
		Dawajhir			
		Khamarpani			
Noise Observatory and Measurement Centres		Turia			
		Kurai			
		Dharam Kua			
		Rukhad			
		Barelipar			

Proposals for Infrastructure	Cluster	Location	Tentative Phasing		
			Short Term	Medium Term	Long term
		Banskheda			
Soil	Whole ESZ	All Notified villages			
Hills and Mountains	Whole ESZ	All Notified villages			
Conservation Through Agriculture	Whole ESZ	All Notified villages			
Permaculture	Whole ESZ	All Notified villages			
Economy and Livelihood					
Traditional Crops	Whole ESZ	All Notified villages			
Tasar Development	Whole ESZ	All Notified villages			
Agro Forestry	Whole ESZ	All Notified villages			
Minor Forest Produce (MFP)	Whole ESZ	All Notified villages			
Animal Husbandry	Whole ESZ	All Notified villages			
Agro Industries	Whole ESZ	All Notified villages			
Household Industries Through SHGS	Whole ESZ	All Notified villages			
Agro Based Tourism	Whole ESZ	All Notified villages			
Research, Monitoring and Training	Whole ESZ	All Notified villages			

1.2.8.1.3 Phasing Interventions for Infrastructures

The priority of infrastructure development in notified villages are based on the activities proposed in the cluster. Village wise priority for infrastructure development is as below table.

Table 8- 3: Phasing interventions for infrastructure development

Proposals for Infrastructure	cluster	Location	Tentative Phasing		
			Short Term	Medium Term	Long Term
Social Infrastructure: Haat Bazar					
Haat Bazar	Jamtra - Kumbhpani	Banskheda			
	Jamtra - Kumbhpani	Gumtara			
	Jamtra - Kumbhpani	Jamtara			
	Jamtra - Kumbhpani	Khamariya			

Proposals for Infrastructure	cluster	Location	Tentative Phasing		
			Short Term	Medium Term	Long Term
	Jamtra - Kumbhpani	Pathri			
	Jamtra - Kumbhpani	Thotamal			
	Khamarpani	Devri			
	Khamarpani	Khamarpani			
	Dharam Kua	Darasi kala			
	Dharam Kua	Pandayer			
	Turia	Kurai			
	Turia	Pindkapar			
	Turia	Turia			
Traffic and Transportation					
Proposal for Road Widening and improvements of roads	Turia				
	Dharam Kua				
	Karmajhiri				
	Jamtra - Kumbhpani				
	Khamarpani				
Infrastructure for Traffic and Transportation					
Proposal for bus stop	Khamarpani	Khamarpani			
	Jamtra - Kumbhpani	Dawajhir			
	Jamtra - Kumbhpani	Banskheda			
	Jamtra - Kumbhpani	Jamtra			
	Karmajhiri	Barelipar			
	Karmajhiri	Ghatkohka			
	Dharam Kua	Darasi Kala			
	Dharam Kua	Dulhapur			
	Turia	Kurai			
	Turia	Pachhdhar			
	Turia	Turia			

1.2.8.2 Source of Funding and Drawing and Disbursing Mechanism

Table 8- 4: Source of Funding and Drawing and Disbursing Mechanism

<table>
<tr><th>Sr. No.</th><th>Type of Proposals</th><th>Name of Scheme</th><th>Funding Agency/ Department</th><th>Drawing and Disburse Mechanism</th></tr>
<tr><td>1</td><td>Widening and Improvement of Roads</td><td>PMGSY</td><td>National Rural Infrastructure Development Agency,</td><td>States may, each year, distribute the State's Allocation among the Districts giving at least 80% on the basis of road length required for providing connectivity to Unconnected Habitations and up to 20% on the basis of road length requiring Upgradation under the PMGSY.</td></tr>
<tr><td>2</td><td>Dringking Water Supply</td><td>Nal Jal Yojna, JJM</td><td>Panchayat and Rural Development Department, M.P.
Department of Drinking Water & Sanitation
Ministry of Jal Shakti</td><td>Fund allocation criteria under JJM:
The notional allocation of fund among state has been modified by including the number of left-out household connections as additional criteria with 20% weightage and 10% weightage is given to rural population affected by water quality, thus allowing more fund for quality affected states. The states can utilise the funds under JJM for taking up schemes in quality affected areas on priority.
<table>
<tr><th>Criteria</th><th>As per NRDWP</th><th>As per JJM</th></tr>
<tr><td>Rural Population (as per last Census)</td><td>40%</td><td>30%</td></tr>
<tr><td>Rural SC and ST population (as per last Census)</td><td>10%</td><td>10%</td></tr>
<tr><td>States under DDP, DPAP, HADP and special category Hill States in terms of rural areas</td><td>40%</td><td>30%</td></tr>
<tr><td>Population (as per IMIS) residing in habitations affected by chemical contaminants including heavy metals (as on 31st March of preceding financial year)</td><td>10%</td><td>10%</td></tr>
<tr><td>Weightage for balance individual household connections to be provided</td><td>Nil</td><td>20%</td></tr>
</table></td></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Sericulture</td><td>Tasar Sericulture Development and Extension Program</td><td rowspan="2">State silk federation Madhya Pradesh government</td><td>Beneficiaries under this scheme is provided subsidy for rearing equipment , construction of rearing house, irrigation and for establishment reeling units. 25% as state share, 25% of share will be borne by beneficiaries and 50% will be borne by CSB respectively.
In Few schemes 60% as C.S.B. share and 40% will be borne by state and beneficiaries respectively.</td></tr>
<tr><td>Mulberry Sericulture Development and Extension Program</td><td>Landless agriculture labor is being provided with 1 acre of mulberry planted land at Govt. mulberry centers on usufruct right.
Rs.6200/- per beneficiary is provided for cultural operation as revolving fund.</td></tr>
</table>

Sr. No.	Type of Proposals	Name of Scheme	Funding Agency/ Department	Drawing and Disburse Mechanism
		Catalytic Development Program		Beneficiaries under this scheme is provided subsidy for rearing equipment , construction of rearing house, irrigation and for establishment of reeling units. 25% as state share, 25% of share will be borne by beneficiaries and 50% will be borne by CSB respectively. In Few schemes 25% as state share & 50% C.S.B. shares and rest 25% will be borne by beneficiaries.
		Integrated cluster development Program		
4	Agriculture and Horticulture	Mission for Integrated Development of Horticulture Schemes	Ministry of Agriculture and Farmer welfare	Government of India (GOI) contributes 60%, of total outlay for developmental programmes in all the states except states in North East and Himalayas, 40% share is contributed by State Governments. In the case of North Eastern States and Himalayan States, GOI contributes 90%.
		National Mission for Sustainable Agriculture		Department of Agriculture & Cooperation, Government of India will communicate tentative annual outlay to each State/implementing agency, who in turn will prepare respective component-wise allocation for Annual Action Plans

Sr. No.	Type of Proposals	Name of Scheme	Funding Agency/ Department	Drawing and Disburse Mechanism
		Rashtriya Krishi Vikas Yojana		Funds under RKVY-RAFTAAR would be provided to the States as grant by the Central Government in the following streams. A. Regular RKVY-RAFTAAR -70% of annual outlay will be allocated among States as per criteria under following heads. 1. Infrastructure and assets- 50% (of 70%) of regular RKVY-RAFTAAR outlay- pre-harvest infrastructure- 20%, post-harvest infrastructure- 30% 2. Value addition linked production projects (agribusiness models) that provide assured/ additional income to farmers including Public Private Partnership for Integrated Agriculture Development (PPPIAD) projects- 30% (of 70%) of regular RKVY outlay. 3. Flexi funds- 20% (of 70%) of regular RKVY-RAFTAAR outlay. States can use this fund for supporting any projects as per their local needs preferably for innovative activities in agriculture and allied sectors. B. RKVY-RAFTAAR special sub-schemes – 20% of total annual outlay - based on national priorities as notified by Govt. of India from time to time for development of region and problem specific areas. C. Innovation and agri-entrepreneur development - 10% of annual outlay- for encouraging innovation and agri-entrepreneurs through skill development and financial support. It will support incubatees, incubation centers, KVKs, awards etc. These funds will be with Central Govt. (DAC&FW) including 2% of administrative costs at the Centre. In case the funds not utilized, it will be diverted to regular RKVY & sub-schemes.
		National Livestock Mission	MINISTRY OF FISHERIES, ANIMAL HUSBANDRY & DAIRYING	The sub-scheme National Livestock Mission is being implemented on a cost sharing ratio of 60:40 between Central & State Government except NE and Himalayan States where the ratio is 90:10 and 100% in case of Union Territories. The component Entrepreneurship Development and Employment Generation (EDEG) and Small Livestock Institute are being implemented on 100% Central Assistance. However, the EDEG is a beneficiary-oriented scheme wherein the entire subsidy portion (25% for General and 33.33% for SC&ST beneficiary) to eligible beneficiary is provided by Central Government

Sr. No.	Type of Proposals	Name of Scheme	Funding Agency/ Department	Drawing and Disburse Mechanism
				through NABARD. Under EDEG the back ended subsidy in North- East /Hill /Left Wing Extremism (LWE) and difficult areas varies between 35% to 60%.
5	Minor Forest Produces	Pradhan mantri Van Dhan Yojna	Tribal Co-Operative Marketing Development Federation of India Limited (TRIFED)	TRIFED spearheads implementation of the Van Dhan programme in 27 States and 307 Districts with availability of MFPs and significant forest dwelling tribal population. Collection and sale of MFPs contribute 40 – 60 % of tribal annual earnings and further "Value Addition" helps in tripling or quadrupling their income.
6	Enterprenureship	The Prime Minister's Employment Generation Program (PMEGP)	MSME	General category beneficiaries can avail of margin money subsidy of 25% of the project cost to set up projects in rural areas and 15% in urban areas where as for beneficiaries belonging to SC/ST/Women/PH/Minorities/Ex-Servicemen/NER, the margin money subsidy is 35% for rural areas and 25% for urban areas. The maximum cost of projects eligible for margin money subsidy is Rs.25 lakh in the manufacturing sector and Rs.10 lakh in the service sector.
7	Household Industries/ Cotttage Industries	Deendayal Upadhyay Grameen Kaushal Yojana (DUGKY)	Ministry of Rural Deveopment. GOI	Benefits to candidates are in the form of free training, free uniform, free course material, free lodging and board in case of residential programs, reimbursements of expenses in non-residential programs, post placement salary top-ups every month for 2-6 months depending on location of placement and placement for at least 70% of all trained with a minimum salary of Rs. 6,000/- per month (as cost to company).
		Equity Grant Scheme	Small Farmers' Agri-Business Consortium (SFAC), Society promoted by Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmers Welfare, Govt. of India	Equity Grant Scheme extends support to the equity base of Farmer Producer Companies (FPCs) by providing matching equity grants subject to maximum of Rs. 15.00 lakh per FPC in two tranches with in a period of 3 Year and to address nascent and emerging FPCs which have paid up capital not exceeding Rs. 30.00 lakh with a view to the undernoted primary objectives a) Enhancing viability and sustainability of FPCs. b) Enhancing credit worthiness of FPCs. c) Enhancing the shareholding of members to increase their ownership and participation in their FPC.

<table>
<tr><th>Sr. No.</th><th>Type of Proposals</th><th>Name of Scheme</th><th>Funding Agency/ Department</th><th>Drawing and Disburse Mechanism</th></tr>
<tr><td></td><td></td><td>Credit Guarantee Fund Scheme</td><td></td><td>The Equity Grant Fund enables eligible FPCs to receive a grant equivalent in amount to the equity contribution of their shareholder members in the FPC, thus enhancing the overall capital base of the FPC. The Scheme shall address nascent and emerging FPCs, which have paid up capital not exceeding Rs. 30 lakhs as on the date of application.</td></tr>
<tr><td rowspan="2">8</td><td rowspan="2">Promotion of Biogas</td><td>Gobar Dhan Yojna</td><td>Ministry of Drinking Water and Sanitation</td><td></td></tr>
<tr><td>New National Biogas and Organic Manure Programme (NNBOMP)</td><td>Ministry of New and Renewable Energy</td><td>Central Financial Assistance (CFA)
Based on the capacity of the plant, the CFA offered under this programme is as follows:
<table><tr><th>Particulars of Central Financial Assistance (CFA) and States / UTs, Regions & Categories of beneficiaries</th><th colspan="5">Biogas Plants under NNB OMP (size 1 to 25m^3 biogas per day)(In Rupees per plant)
Central Subsidy Rates Applicable</th></tr><tr><td></td><td>1 m^3</td><td>2-6 m^3</td><td>8-10 m^3</td><td>15 m^3</td><td>20-25 m^3</td></tr><tr><td>NER States, including Sikkim and including SC and ST Categories of NER.</td><td>17,000</td><td>22,000</td><td>24,000</td><td>25,000</td><td>35,000</td></tr><tr><td>Special Category States (Jammu & Kashmir, Himachal Pradesh, Uttarakhand, and Andaman &Nicobar Islands) and Scheduled Castes / Scheduled Tribes of all other States.</td><td>10,000</td><td>13,000</td><td>18,000</td><td>21,000</td><td>28,000</td></tr><tr><td>All other States (General Category)</td><td>7,500</td><td>12,000</td><td>16,000</td><td>20,000</td><td>25,000</td></tr><tr><td>Additional Subsidy for cattle dung based biogas plants if linked with sanitary toilets, only for individual households (Rs. Per Biogas Plant) fixed amount.</td><td>1,600</td><td>1,600</td><td>1,600</td><td>NIL</td><td>NIL</td></tr></table></td></tr>
</table>

Sr. No.	Type of Proposals	Name of Scheme	Funding Agency/ Department	Drawing and Disburse Mechanism
9	Promotion of Solar Energy in Agriculture	KUSUM (Kisan Urja Suraksha evam Utthaan Mahabhiyan) Scheme	Ministry of new and renewable energy	3 Components of the scheme: **Component A** Under Component A, Renewable power plants of capacity 500 KW to 2 MW will be setup by individual farmers/ cooperatives/panchayats /farmer producer organisations (FPO) on their barren or cultivable lands. The power generated will be purchased by the DISCOMs at Feed in tariffs determined by respective SERC. The scheme will open a stable and continuous source of income to the rural land owners. Performance Based Incentives @ Rs. 0.40 per unit for five years to be provided to DISCOMs. For both **Component-B** and **Component-C**, central financial assistance (CFA) of 30% of the benchmark cost or the tender cost, whichever is lower, will be provided. The State Government will give a subsidy of 30%; and the remaining 40% will be provided by the farmer. Bank finance may be made available for meeting 30% of the cost. The remaining 10% will be provided by the farmer. Higher CFA of 50% will be provided for North Eastern States, Sikkim, Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Lakshadweep and A&N Islands.

1.2.9 Monitoring And Evaluation Committee Meetings

1.2.9.1 Stakeholders and Monitoring Committee Members for Zonal Masterplans for Eco-Sensitive Zone

A Monitoring Committee Meeting and stakeholder consultation meeting for baseline assessment study for Eco Sensitive Zone of Pench Tiger Reserve was scheduled by The Divisional Commissioner, Jabalpur vide letter no. 135/ Kshetriya Sakha/ 2021 and 35/Kshetriya Sakha/ 2021 at Eco centre Karmajhiri on 11th February, 2021 and 12th January 2021 respectively. The list of stakeholders as per above mentioned letter is as below.

1	The Divisional Commissioner, Jabalpur
2	The Field Director, Pench Tiger Reserve
3	The District Collector, Seoni
4	The District Collector, Chhindwara
5	The Chief Executive Officer, Seoni
6	The Chief Executive Officer, Chhindwara
7	Regional Manager, Madhya Pradesh State Tourism Development Corporation
8	Regional Manager, Madhya Pradesh Pollution Control Board
9	Executive Engineer Public Health Department, Seoni
8	Executive Engineer Public Health Department, Chhindwara
10	Executive Engineer Public Works Department, Seoni
11	Executive Engineer Public Works Department, Chhindwara

1.2.9.2 Evaluation of Baseline Assessment Study (Part-1)

1.2.9.2.1 Stakeholder Consultation and Monitoring Committee meetings

The agenda of the meeting was to share this study with stakeholders and local people and getting feedbacks and inputs from them. The minutes of the meeting for Monitoring Committee is as follows:

कार्यालय मुख्य वन संरक्षक एवं क्षेत्र संचालक
पेंच टाईगर रिजर्व, सिवनी (म.प्र.)

Phone - 07692-223794, Fax-07692-223204, www.penchtiger.co.in, e-mail- fdpenchnp@mpforest.org,

क्रमांक/मा.चि./ 1360 सिवनी/दिनांक/ 26/2/21

प्रति,

1. कलेक्टर, जिला–सिवनी/छिन्दवाड़ा
2. संयुक्त आयुक्त, जबलपुर
3. मुख्य कार्यपालन अधिकारी, जिला पंचायत, सिवनी/छिन्दवाड़ा
4. क्षेत्रीय प्रबंधक, म.प्र. पर्यटन विकास जबलपुर
5. क्षेत्रीय अधिकारी म.प्र. प्रदूषण नियंत्रण बोर्ड जबलपुर संभाग
6. उप संचालक, पेंच टाइगर रिजर्व, सिवनी
7. अनुविभागयी अधिकारी (राजस्व) कुरई/चौरई
8. कार्यपालन यंत्री लोक स्वास्थ्य यंत्रिकी विभाग, सिवनी/छिन्दवाड़ा
9. कार्यपालन यंत्री लोक निर्माण विभाग, सिवनी/छिन्दवाड़ा
10. श्री केवल राना सांई, कंस्लटिंग इंजीनियर्स प्रा.लि. अहमदाबाद
11. श्री निसर्ग तनकी सांई, कंस्लटिंग इंजीनियर्स प्रा.लि. अहमदाबाद

विषय – Preparation of ZMP for ESZ Cluster 4 MP – Minutes of the Meeting.

संदर्भ – कार्यालय कमिश्नर, जबलपुर संभाग जबलपुर का पत्र क्रमांक/283/क्षे.शा./वि. जां/2021 जबलपुर दिनांक 24.02.2021।

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विषयातर्गत पेंच टाइगर रिजर्व, सिवनी के ईको सेंसटिव जोन के मास्टर प्लान के संबंध में बैठक दिनांक 12.02.2021 के कार्यवाही विवरण का अनुमोदन संभागीय आयुक्त जबलपुर के द्वारा किया गया है।

अनुमोदित कार्यवाही विवरण की छायाप्रति संलग्न है, कृपया पालन प्रतिवेदन शीघ्र प्रेषित करने का कष्ट करें।

संलग्न – अनुमोदित कार्यवाही विवरण।

मुख्य वनसंरक्षक एवं क्षेत्र संचालक
(सदस्य सचिव)
निगरानी समिति
पेंच टाइगर रिजर्व, सिवनी (म.प्र.)

क्रमांक/मा.चि./1360 सिवनी/दिनांक/

प्रतिलिपि – संभागीय आयुक्त जबलपुर संभाग जबलपुर की ओर सूचनार्थ प्रेषित।

मुख्य वनसंरक्षक एवं क्षेत्र संचालक
(सदस्य सचिव)
निगरानी समिति
पेंच टाइगर रिजर्व, सिवनी (म.प्र.)

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Preparation of ZMP for ESZ for Cluster 4 MP – Minutes of the Meeting

Subject	**Minutes of the Meeting for Preparation of Zonal Master Plan and Sub- Zonal Tourism Master Plan for Eco-Sensitive Zone (ESZ) listed in Cluster 4 (Satpura Tiger Reserve (STR) and Pench Tiger Reserve (PTR)) of Madhya Pradeshwith Notified Monitoring Committee and other Stakeholders**	
Meeting Date	11th February, 2021	
Place	Eco Center, Karmajhiri, Pench Tiger Reserve, Madhya Pradesh	
Participants	***From Stakeholder/ Monitoring Committee***	***From SAI Consulting Engineers Pvt. Ltd.***
	The Divisional Commissioner, Jabalpur Division The Field Director, Pench Tiger Reserve The District Collector, Seoni The Chief Executive Officer, Seoni The Regional Manager, Madhya Pradesh Tourism The Regional Officer, Madhya Pradesh Pollution Control Board	Mr. Kewal Rana, Urban Planner
	The Deputy Field Director, Pench Tiger Reserve The Joint Commissioner, Jabalpur Division The SDM, Kurai Representatives from PHE and PWD, Seoni	Mr. Nisarg Thanki, Urban Planner

S. No.	Points Discussed/suggestions made
1.	The Stakeholder Consultation Meeting was organised for presentation of Baseline Assessment Study of Eco Sensitive Zone of Pench Tiger Reserve vide letter no. 135/Kshetriya shakha/2021 from the office of the Divisional Commissioner, Jabalpur dated 30th January, 2021 at Karmajhiri on 11th February, 2021 at 12:00 P.M. Team of SAI Consulting Engineers Pvt.Ltd. – A Systra group Company presented the Baseline Assessment Study for Eco Sensitive Zone of Pench Tiger Reserve with all the stakeholders and staff of forest department during the meeting.
2.	A brief introduction about work plan, the methodology adopted, and components of Zonal Master Plan was presented in the meeting. The detailed presentation covering analysis of all the existing components of Zonal Master Plan. Forest, Tourism, settlement areas, infrastructure facilities and existing landuse, landcover etc. were discussed in detail during above stakeholder consultation.
3.	The Divisional Commissioner, Jabalpur division and The District Collector, Seoni district suggested for improvement of roads 1. Karmajhiri to Jamtra (WBM road) 2. Arjun to Telia
4.	During the presentation, it was discussed that Karmajhiri is going to relocate in near future. The Divisional Commissioner suggested to provide proposals accordingly in Draft Zonal Master Plan.

5.	During the presentation, following points were suggested by the Field Director: • Verify data for poaching cases from the office of Pench Tiger Reserve. • Verify the data for number of rooms available in accommodation facilities. • Consider tourism routes of Kumbhpani and Masood Barrier as well as redevelopment of Bison retreat in the study.
6.	The Divisional Commissioner suggested for inclusion of overview of tourism scenario in Pench Tiger Reserve that falls on the other side of State border, in Maharasthra.
7.	The Consultant presented all the explored and potential tourism sites in the presentation. The Field Director and the Divisional Commissioner have suggested not to promote religious tourism sites in the Sub Zonal Tourism Master Plan as religious tourism increases pollution and biotic pressure in the area. Also, religious tourism may lead to haphazard and unorganized commercialization in the area which may harm the forest and wildlife. The local tribal community can perform their rituals in traditional way but not to promote these kinds of tourism in forest area.
8.	During the presentation, the Divisional Commissioner suggested to identify and plan for inclusive and packaged theme-based tourism in ESZ. In addition to that it was also suggested to promote local art, food etc. through culture theme-based tourism. A boost to local economy can be generated with help of suitable skill training to local villagers. Moreover, it was also suggested to develop model villages in ESZ areas for rural development / tourism in order to generate employment opportunities.
9.	The District Collector, Seoni and The Field Director suggested to highlight issue of fishing as threat in overall SWOT analysis. In addition to that, it was also suggested for proposals related to provide alternate opportunities in order to reduce fishing activities.

The meetings ended with vote of thanks.

आयुक्त महोदय द्वारा अनुमोदित

23/2/21

क्षेत्र संचालक (सदस्य सचिव)
पेंच टायगर रिजर्व प्रबन्धकीय समिति
छिंदवाड़ा (म. प्र.)

These valuable suggestions/ comments mentioned in Minutes of Meeting above were incorporated in baseline assessment study report. The compliance report for the same is as below.

Compliance Report for comments received on Baseline Assessment Report for Eco Sensitive Zone of Pench Tiger Reserve		
Sr. No.	**Points Discussed/ Suggestions made**	**Remarks**
1	The Divisional Commissioner, Jabalpur division and The District Collector, Seoni district suggested for improvement of roads	Noted & to be considered in Draft Zonal Master Plan
	1. Karmajhiri to Jamtra (WBM road)	
	2. Arjuni to Telia	
2	During the presentation, it is discussed that Karmajhiri is going to relocate in near future. The Divisional Commissioner suggested to provide proposals accordingly in Draft Zonal Master Plan.	Noted & to be considered in Draft Zonal Master Plan
3	During the presentation, following points were suggested by the Field Director:	
	· Verify data for poaching cases from the office of Pench Tiger Reserve.	Approved data for poaching in PTR was collected during site visit (copy of data is enclosed herewith for reference). Consultant has requested for any further updated data for the same which is still pending to be received. The same will be updated once the data is received in next stage.
	· To verify the data for number of rooms available in accommodation facilities	Data Verified with the Field Director Sir, and is same as mentioned in the report in Chapter-6, Section- 6.5 (page no. 171)
	· Consideration tourism routes of Kumbhpani and Masood Barrier as well as redevelopment of Bison retreat in the study.	Noted & to be considered in Draft Zonal Master Plan
4	The Divisional Commissioner suggested for inclusion of overview of tourism scenario in Pench Tiger Reserve of Maharashtra.	Noted. Overview of Tourism Scenario of Maharashtra is added in Chapter-8, Section- 8.2 (Page. No.207) of Baseline Assessment Study Report of Pench Tiger Reserve
5	The Consultant have presented all the explored and potential tourism sites in the presentation. The Field Director and the Divisional Commissioner have suggested not to promote religious tourism sites in the Sub Zonal Tourism Master Plan as religious tourism increases pollution and biotic pressure in the area. Also, religious tourism may lead to haphazard and unorganized commercialization in the area which may harm the forest and wildlife. The local tribal community can perform their rituals in traditional way but not to promote these kinds of tourism in forest area.	Noted & to be considered in Draft Zonal Master Plan

Compliance Report for comments received on Baseline Assessment Report for Eco Sensitive Zone of Pench Tiger Reserve		
6	During the presentation, the Divisional Commissioner suggested to identify and plan for inclusive and packaged theme-based tourism in ESZ. In addition to that it was also suggested to promote local art, food etc. through culture theme-based tourism. A boost to local economy can be generated with help of suitable skill training to local villagers. Moreover, it was also suggested to develop model villages in ESZ areas for rural development / tourism in order to generate employment opportunities.	Noted & to be considered in Draft Zonal Master Plan
7	The District Collector, Seoni and The Field Director suggested to highlight issue of fishing as threat in overall SWOT analysis. In addition to that, it was also suggested for proposals related to provide alternate opportunities in order to reduce fishing activities.	Noted. The Issue of fishing is already mentioned in Chapter-12 (Page no. 253). The same will be included in Draft Zonal Master Plan.

Inputs and feedback received from stakeholders in form of Minutes of Meetings vide Memo No. 94 / Kshetriya Sakha/ 2021 as follows:

OFFICE OF THE COMMISSIONER JABALPUR DIVISIONAL JABALPUR

Memo NO. - 94/संभाग/2021 Date - 19/1/2021

Prepration of ZMP for ESZ for Cluster 4 MP- Minutes of the Meeting

Subject	**Minutes of the Meeting for Preparation of Zonal Master Plan and Sub- Zonal Tourism Master Plan for Eco-Sensitive Zone (ESZ) listed in Cluster 4 (Satpura Tiger Reserve (STR) and Pench Tiger Reserve (PTR)) of Madhya Pradesh with The Field Director, Pench Tiger Reserve, Seoni**	
Meeting Date	12th January, 2021	
Place	Eco Center, Karmajhiri, Pench Tiger Reserve, Madhya Pradesh	
Participants	***From Stakeholder***	***From SAI Consulting Engineers Pvt. Ltd.***
	The Divisional Commissioner, Jabalpur Division The Filed Director, Pench Tiger Reserve The Joint Commissioner, Jabalpur Division The Deputy Field Director, Pench Tiger Reserve Executive Engineer, PHE/PWD, Seoni and Chhindwara Staff of PTR, Representative of Pollution Board & Tourism Jabalpur Division	Mr. Kewal Rana, Urban Planner Mr. Nisarg Thanki, Urban Planner

S. No.	Points Discussed/suggestions made
1.	The Stakeholder Consultation Meeting is organised for presentation of Baseline Assessment Study of Eco Sensitive Zone of Pench Tiger Reserve vide letter no. 35/kshetriyashakha/2021 from the office of the Divisional Commissioner, Jabalpur dated 05/01/2021 at Karmajhiri on 12/01/2021 on 3:00 P.M. Team of SAI Consulting Engineers Pvt ltd – A Systra group Company presented the Baseline Assessment Study for Eco Sensitive Zone of Pench Tiger Reserve with all the stakeholders and staff of forest department during the meeting.
2.	A brief introduction about work plan, the methodology adopted, and components of Zonal Master Plan is presented in the meeting. The detailed presentation covering analysis of all the existing components of Zonal Master Plani.e. Forest, Tourism, settlement areas, infrastructure facilities and existing landuse landcover etc. were discussed in detail during above said stakeholder consultation.
3.	During the presentation, The Consultant have presented the previously available data for poaching, forest fire, illegal timber collection and animal accident up to year 2014-2015 in the presentation. Hence, the Field Director suggested to collect latest data for the same from his office and update the report accordingly.
4.	The Demographic and Worker Profile Analysis wascarried out based on primary survey and data of Census 2011 in the study, the commissioner suggested to consider latest data from NSSO for analysis.
5.	The Commissioner pointed out that per acre yield of wheat mentioned in the presentation is large in numbers compared to actual figures and have suggested to confirm and rectify the data in consultation with the local farmers.
6.	The Consultant presented analysis of ground water data, the Divisional Commissioner and The Field Director mentioned that if the trend of decreasing ground water level will continue at current rate as mentioned in the presentation, the aquifer of the area might get dry in near future and have suggested to consider proposals for rain water harvesting in the zonal master plan.

19/01/21

7.	The Consultant have highlighted lack of solid and liquid waste management in the area near Khawasa and Turia Gate. The Field Director agreed with the current issue of solid waste management in the area.
8.	During the presentation of Tourist Data, the Divisional Commissioner suggested that as tourism in core area is closed for 3 months (July to September), tourism in buffer area can be developed and promoted during this time period.
9.	The Consultant have presented all the explored and potential tourism sites in the presentation. The Field Director and the Divisional Commissioner have suggested not to promote religious tourism sites in the Sub Zonal Tourism Master Plan as religious tourism increases pollution and biotic pressure in the area. Also, religious tourism may lead to haphazard and unorganized commercialization in the area which may harm the forest and wildlife. The local tribal community can perform their rituals in traditional way but not to promote these kinds of tourism in forest area.
10.	The Field director have suggested to update data for resorts and rooms (already provided by the Field Director during the meeting) in the ESZ and have also suggested that proposal should be made on a framework to regularize development of resorts and hotels in ESZ.

The meetings ended with vote of thanks.

(B. Chandrashekhar)
Commissioner
Jabalpur Divisional Jabalpur

Memo No.- 94 A /क्रमांक/2021
Forwarded,

Date - 19 **/1/2021**

1- Collector Seoni / Chhindwara
2- Field Director Pench Tiger Reserve Seoni
3- Team Leader SAI Consulting Engineers Pvt. Ltd.
4- R.M. MP Tourism Jabalpur
5- Regional Manager MPPCB Jabalpur
6- EEPWD Seoni/ Chhindwara
7- EEPHE Seoni/ Chhindwara

(B. Chandrashekhar)
Commissioner
Jabalpur Divisional Jabalpur

Figure Error! No text of specified style in document.**-1 : Photographs from the stakeholder's consultation meeting:**

These valuable suggestions/ comments mentioned in Minutes of Meeting above were incorporated in baseline assessment study report. The compliance report for the same is as below.

Table Error! No text of specified style in document.**-1 : Compliance Report- Monitoring Committee Meeting**

Sr No.	Comments on Baseline Study	Remarks
1	During the presentation, The Consultant have presented the previously available data for poaching, forest fire, illegal timber collection and animal accident up to year 2014-2015 in the presentation. Hence, the Field Director Sir suggested to collect latest data for the same from his office and update the report accordingly.	Noted. Data updated in following sections of Chapter 4 Forest: 1. Poaching in Section 4.8.2 (Page no.71) 2. Forest fire in Section 4.8.1 . (Page no.69) 3. Illegal Timber Collection in Section 4.8.4 (Page no.73) 4. Animal accidents in Section 4.8.3 (Page no.73)
2	The Demographic and Worker Profile Analysis was carried out based on primary survey and data of Census 2011 in the study, the commissioner sir suggested to consider latest data from NSSO for analysis.	Noted. village wise NSSO latest data for notified region is not available. In absence of NSSO data, latest data was recorded from primary survey and analysed considering the same. The primary survey was carried out during field visit with local villagers, shop keepers, farmers, Panchayat member, Government officials, Resort owners, Gypsy drivers, guides and other workers during field survey. Minutes of Meeting for these consultations are attached herewith in Annexure 2.1 of Baseline Study Assessment Report.
3	The Commissioner Sir pointed out that per acre yield of wheat mentioned in the presentation is large in numbers compared to actual figures and have suggested to confirm and rectify the data in consultation with the local farmers.	Noted . Incorporated in Section 5.2 of Chapter 05 Village Profile. (Table No. 5.2,Page No. 100)
4	The Consultant presented analysis of ground water data, the Divisional Commissioner Sir and The Field Director Sir mentioned that if the trend of decreasing ground water level will continue at current rate as mentioned in the presentation, the aquifer of the area might get dry in near future and have suggested to consider proposals for rain water harvesting in the zonal master plan.	Noted. It will be a part of the proposals and will be incorporated in Draft stage.
5	The Consultant have highlighted lack of solid and liquid waste management in	Noted. It will be a part of the proposals and will be incorporated in Draft stage.

Sr No.	Comments on Baseline Study	Remarks
	the area near Khawasa and Turia Gate. The Field Director Sir agreed with the current issue of solid waste management in the area.	
6	During the presentation of Tourist Data, the Divisional Commissioner Sir suggested that as tourism in protected area is closed for 3 months (July to September), tourism in buffer area can be developed and promoted during this time period.	Noted. It will be a part of the proposals and will be incorporated in Draft stage.
7	The Consultant have presented all the explored and potential tourism sites in the presentation. The Field Director sir and the Divisional Commissioner sir have suggested not to promote religious tourism sites in the Sub Zonal Tourism Master Plan as religious tourism increases pollution and biotic pressure in the area. Also, religious tourism may lead to haphazard and unorganized commercialization in the area which may harm the forest and wildlife. The local tribal community can perform their rituals in traditional way but not to promote these kinds of tourism in forest area.	Noted. It will be a part of the proposals and will be incorporated in Draft stage.
8	The Field director sir have suggested to update data for resorts and rooms (already provided by the Field Director sir during the meeting) in the ESZ and have also suggested that proposal should be made on a framework to regularize development of resorts and hotels in ESZ.	Noted . Incorporated in Section 6.5 of Chapter 6 Sub-Zonal Tourism Master Plan and annexure 6.1. (Page No. 171)

1.2.9.2.2 Evaluation Committee meetings by Madhya Pradesh Tourism Board

The Evaluation committee meeting was held on date 23rd March 2021 at office of Madhya Pradesh Tourism Board, Bhopal.

The attendees of meeting and Minutes of Meetings for the same is as below.

Madhya Pradesh Tourism Board

Bhopal

Date- 23 April 2021

Minutes of Meeting

Please find enclosed herewith duly approved minutes of Evaluation Committee meeting held on 23rd and 24th March 2021 for 'Preparation of Zonal Master Plan for Eco-Sensitive Zones of National Parks/ Wildlife Sanctuaries of M.P.' for information and necessary action.

Managing Director

To,

1. Mr. H.S. Negi, Addl. PCCF, Wildlife, Bhopal
2. Dr. Amit Gajbhiye, Joint Director, Directorate of Town and Country Planning, Bhopal
3. Mr. Sanjeev Sachdev, Chief Scientific Officer, EPCO Bhopal
4. Mr. V. Venugopal (Nodal Officer), Manager GIS, MAP-IT Department, Bhopal
5. Mr. L. Krishnamoorthy, Field Director, Satpura Tiger Reserve, Hoshangabad, M.P.
6. Mr. Vikram Singh Parihar, Field Director, Pench Tiger Reserve, Seoni, M.P.
7. Mr. Vincent Rahim, Field Director, Bandhavgarh Tiger Reserve, Umaria, M.P.
8. Mr. Y.P. Singh, Field Director, Sanjay Tiger Reserve and Bagdara Wildlife Sanctuary, Seedhi, M.P.
9. Mr. Madhu V. Raj, Divisional Forest Officer, Jeevashm National Park, Dindori, M.P.
10. Mr. Karn Joshi, Team Leader, M/s Sai Consulting Engineers Pvt. Ltd., Ahmedabad
11. Mr. Virendra Kumar, Sr. Vice President, M/s Feedback Infra Pvt. Ltd., Gurugram
12. Mr. Vineet Trivedi, Manager, M/s IPE Global Ltd., Delhi

Managing Director

PROCEEDINGS OF THE EVALUATION COMMITTEE MEETING FOR DRAFT ZONAL MASTER PLAN/ BASELINE STUDY

Evaluation Committee meeting for 'Preparation of Zonal Master Plan for Eco-Sensitive Zones of National Parks/ Wildlife Sanctuaries of M.P.' was held on 23rd and 24th March 2021 at 11:00 a.m. under the chairmanship of Ms. Sonia Meena, Additional Managing Director, MPTB, Bhopal.

LIST OF PARTICIPANTS

Evaluation Committee Members

1. Ms. Sonia Meena, Additional Managing Director, MPTB (Chairperson)
2. Mr. H.S. Negi, Addl. PCCF, Wildlife, Bhopal
3. Dr. Amit Gajbhiye, Joint Director, Directorate of Town and Country Planning, Bhopal
4. Mr. Sanjeev Sachdev, Chief Scientific Officer, EPCO Bhopal
5. Mr. V Venugopal (Nodal Officer), Manager-GIS, MAP-IT Department, Bhopal
6. Mr. L. Krishnamoorthy, Field Director, Satpura National Park, Hoshangabad, M.P. (for Satpura Tiger Reserve only)
7. Mr. Vikram Singh Parihar, Field Director, Pench Tiger Reserve, Seoni, M.P. (for Pench Tiger Reserve only)
8. Mr. Vincent Rahim, Field Director, Bandhavgarh Tiger Reserve, Umaria, M.P. (for Bandhavgarh Tiger Reserve only)
9. Mr. Y.P. Singh, Field Director, Sanjay Tiger Reserve and Bagdara Wildlife Sanctuary, Seedhi, M.P. (for Sanjay Tiger Reserve and Bagdara Wildlife Sanctuary only)
10. Mr. Madhu V. Raj, Divisional Forest Officer, Jeevashm National Park, Dindori, M.P. (for Jeevashm National Park only)

Representatives from Madhya Pradesh Tourism Board, Bhopal

1. Mr. Prashant Singh Baghel, Joint Director (Planning), MPTB
2. Mrs. Tanvi Shrivastava, Tourism Planner, MPTB

Representatives from M/s Sai Consulting Engineers Pvt. Ltd., Ahmedabad

1. Mr. Karn Joshi, Team Leader
2. Mr. Kewal Rana, Urban Planner
3. Mr. Nisarg Thanki, Urban Planner

Representatives from M/s Feedback Infra Pvt. Ltd.

1. Mr. Virendra Kumar, Sr. Vice President
2. Ms. Karishma Prasad, Dy. Manager

Representatives from M/s IPE Global Ltd.

1. Mr. Vineet Trivedi, Manager
2. Ms. Sayali Khokale, Environmental Planner
3. Mr. Vineesh Das K, Assistant Planner
4. Manas Shukla, Consultant

The softcopy of the Draft Zonal Master Plan/ Baseline Study was already sent to the evaluation committee members by mail. The presentations were made by the consultants on their Draft Zonal Master Plan/ Baseline Study to present it in the meeting. Evaluation committee members analyzed the studies on the basis of scope of work and framework provided to them for the 'Preparation of Zonal Master Plan for the Eco-Sensitive Zones of National Parks/ Wildlife Sanctuaries of M.P.' and they provided their inputs and suggestions.

Points to note:-

1. Final ZMP has to be submitted in Hindi also. (2 copies)
2. Hard copies of the reports are to be provided to all the Evaluation committee members for their inputs.
3. Contact Mrs. Swati Pramar for Homestay & Rural Tourism data, Mr. Ram Tiwari for Adventure data & Mr. Suresh Jhariya for Investment Promotion data (data of MPT land parcel, hotels, MPT infrastructures and other info) in MPTB, collect MPT data from all the three & incorporate all the data in the reports & map.
4. All the below-mentioned points that are suggested by the evaluation committee members have to be incorporated in the reports. Two hard copies of the updated Baseline/ Draft Zonal Master Plan report have to be submitted to MPTB and softcopy (pdf and editable version) of the report has to be mailed by the consultant.
5. Carrying Capacity formula for accommodation (no. of beds) has been sent to all the clusters by mail. Carrying Capacity formula for National Park was already mailed to all the clusters before. Both the formulas are to be incorporated for finding out the carrying capacity.
6. Restructure the chapters/ template according to draft guidelines by MoEFCC.

Date- 23rd March 2021

1. **Presentation by M/s Sai Consulting Engineers Pvt. Ltd on Draft Zonal Master Plan of Satpura Tiger Reserve (Cluster-4)**

Sai Consulting Engineers Pvt. Ltd. made a presentation on the updated Draft Zonal Master Plan report of Satpura Tiger Reserve of Cluster-4. The Evaluation committee members gave their inputs and suggestions.

The Evaluation Committee recommended that:

1. Provide hard copies to all the EC members for their inputs. Comments received within 10 days have to be incorporated in the report.
2. Consultant has to submit individual chapters from the Draft Zonal Master Plan report to MPTB which are to be sent to all the concerned departments. Comments received within 10 days are to be incorporated in the report by the consultant.
3. Land use / Land cover has to be checked & to be discussed in detail with F.D. Satpura. Presentation has to be done in presence of F.D. Satpura in LAC meeting to concerned stakeholders in Pachmarhi.

2. **Presentation by M/s Sai Consulting Engineers Pvt. Ltd on Baseline Study of Pench Tiger Reserve (Cluster-4)**

Sai Consulting Engineers Pvt. Ltd. made a presentation on the Baseline study report of Pench Tiger Reserve of Cluster-4. The Evaluation committee members gave their inputs and suggestions.

The Evaluation Committee recommended that:

1. For poaching & illegal fishing data, please check & contact F.D. Pench. Data for year 2019-2020 & 2021.
2. Check data till 2021 for worker profile in section "Settlements in ESZ".
3. Masurnala has to be added into identified activity routes.
4. Mention Tourist footfall data of 2021
5. Carrying Capacity for accommodation has to be rechecked. Mention number of beds instead of rooms. Take updated data for no. of rooms from F.D. Pench.

3. **Presentation by M/s Feedback Infra Pvt. Ltd on Draft Zonal Master Plan of Jeevashm National Park Ghughwa (Cluster-2)**

M/s Feedback Infra Pvt. Ltd. made a presentation on the Draft ZMP of Jeevashm National Park of Cluster-2. The Evaluation committee members gave their inputs and suggestions.

The Evaluation Committee recommended that:

1. Correct the data for no. of notified, draft & not yet notified ESZs.
2. Mention some successful case studies from other parts of the country. Best practices of waste management, water conversation, agricultural activities may also be mentioned.
3. Only focusing on Tourism should not be the aim. Holistic Development is to be done.
4. Zoning has to be done on map.
5. Itinerary has to be proposed in a logical member.
6. Interventions are to be reconsidered. Find out methods for improvising Agricultural activities, water regimes, etc. Homestays, Rurals tourism and Camping related activities may be suggested for proposal.
7. Follow everything according to the Gazette Notification strictly.
8. Within the National Park (Protected area) proposal cannot be given. However suggestive measures can be proposed.
9. Natural integrity of the National park has to be maintained, followed by some tourist activities.

Date- 24th March 2021

4. **Presentation by M/s IPE Global Ltd on Draft Zonal Master Plan of Sanjay Tiger Reserve (Cluster-1)**

M/s IPE Global Ltd. made a presentation on the Draft ZMP of Sanjay Tiger Reserve under Cluster-1. The Evaluation committee members gave their inputs and suggestions.

The Evaluation Committee recommended that:

1. Mr. H.S. Negi asked the consultants to read the final Notification by GOI very carefully and follow it strictly. He also instructed them to specifically see the Prohibited, Regulated & Permitted activities listed in the notifications.
2. F.D. Sanjay suggested to exclude villages from the plan which lies inside the core area. Those village will be relocated in future.
3. Overall 100m proposed area of no development zone in Draft ESZ should be removed or renamed. No Development Zone word should not be used. Strict additional restrictions should not be made.
4. List down the name of villages in the report in Sanjay N.P.
5. Suggestive Mitigation measures shall be proposed of sustainable nature.
6. Safari Charges are wrong – Please correct. Contact F.D. Sanjay for authentic data.
7. As per NTCA guidelines, hot air balloon activity is restricted activity. Therefore, this activity should be restricted in this area – Don't propose this activity (Outside the protected area this can be proposed.)
8. Nearest airport from Rewa – Mention it in map & report (Complete connectivity shall be mentioned). Also show clear connectivity from different parts of India to capture tourists.
9. On the way from Parsil to Rewa, Baharatpur is situated in between which can be included in the circuit for handloom. Handloom activities are prominent in Bharatpur.
10. Karwahi village is beside the core area, so no hotels & permanent structures can be proposed as it is within 1 km. Suitable only for camping (TPA-1)
11. Check 1 km from core boundary, no new construction activities shall be permitted within the area. Only accommodation for temporary occupation of tourists related to Eco Tourism activities are permitted.
12. Kusmi, Bastna, Poodhi and Badkadol- Promotion of tourism activities in these four areas is suitable for this park.
13. For the conservation of water bodies, please look at the suggestive measures again more carefully (read notification)
14. For proposals, list the existing schemes & mention how can they be implemented under these schemes in these areas.
15. Mention some best practices & case studies from other parts of the country are needed.
16. Planning of leguminous trees- exotic plants shall not be proposed (coffee, cocoa, banana etc). Authentic survey from local people is needed & add it in proposals (trees / plants)
17. Banas and Gopal river - near this river there are many beautiful spots where tented accommodation can be proposed.
18. Home stays, Rural Tourism, Adventure related activities shall be promoted.

NOTE:-

- 15 days timeline is given to submit the updated report.
- Mention references in the report
- Justified reasons are needed for the areas in which proposals are proposed. (Areas should be justified). Link provisions of notifications with the proposals.

5. Presentation by M/s IPE Global Ltd on Draft Zonal Master Plan of Bagdara Wildlife Sanctuary (Cluster-1)

M/s IPE Global Ltd. made a presentation on the Draft ZMP of Bagdara Wildlife Sanctuary under Cluster-1. The Evaluation committee members gave their inputs and suggestions.

The Evaluation Committee recommended that:

1. Adventure activities / sports, training program and camping can be proposed in Bagdara.
2. Livelihood opportunities can be created though proposal.

6. Presentation by M/s IPE Global Ltd on Baseline Study report of Bandhavgarh Tiger Reserve (Cluster-1)

M/s IPE Global Ltd. made a presentation on the Draft ZMP of Bagdara Wildlife Sanctuary under Cluster-1. The Evaluation committee members gave their inputs and suggestions.

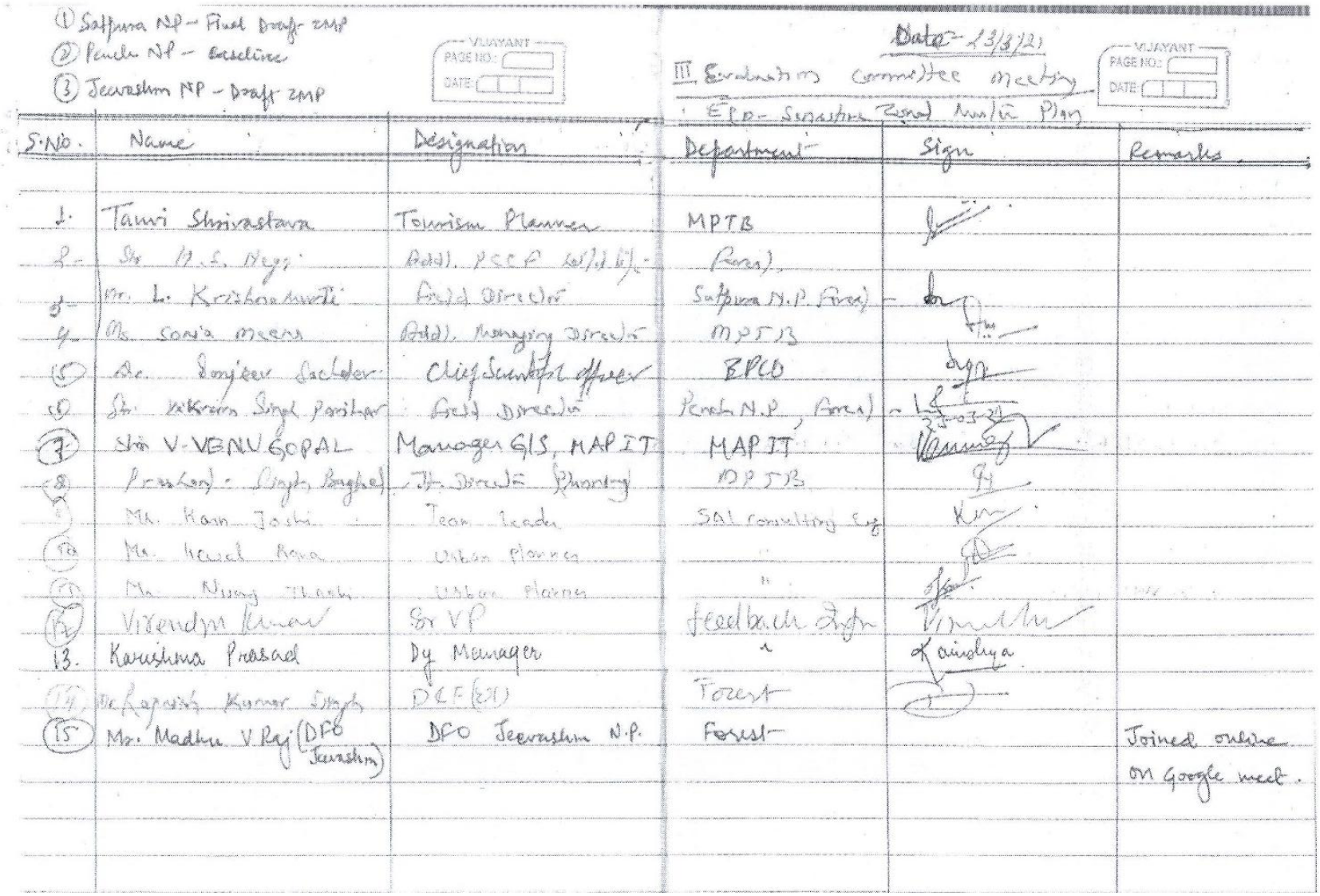
The Evaluation Committee recommended that:

1. Mention Human - animal conflict in the report and its measures.
2. For forest area classification & changes in forest, refer Forest survey of India.
3. No. of ESZ – 27, Draft notified– 4, Not yet notified – 02, Notified – 21 – correct the data in the presentation/ report.
4. Collect the Elephant movement map from F.D. Bandhavgarh and include it in the report.
5. Literacy rate shall be mentioned.
6. Collect the correct data of charges of Tourism & Heritage from F. D Bandhavgarh.
7. Correct the data for number of booking offices - Change it from 3 to 1 (Tala office only)
8. Tourism consultant in high Tourism areas can be one of the proposals.
9. Land use & Planning legislation (Below mentioned points shall be included in the report under this heading)
    - Existing planning framework.
    - Legislative framework
    - Observations & Inferences.
10. Data Analysis Methodology (Below mentioned points shall be included in the report under this heading)
    - SWOC
    - Land Suitability Analysis
    - Carrying capacity analysis
    - Development analysis

NOTE:

1. Consultant from Cluster- 1 met Mrs. Swati Pramar (Advisor, Rural Tourism and Homestays), Mr. Ram Tiwari (Deputy Director, Adventure) and Mr. Suresh Jhariya (Joint Director, Investment Promotion) in MPTB on 24/03/21 for collecting the data of MPT for all the National Parks falling under cluster-1. It is instructed to include all the data of Rural Tourism, Homestays, Adventure and I.P. of MPT to all the Draft Zonal Master Plans and maps.
2. Points given in the Minutes of Meeting for Satpura Tiger Reserve- Draft ZMP and Sanjay Tiger Reserve- Draft ZMP shall be applicable to all the ESZ – Draft ZMP wherever relevant.
3. Implementable Solid Waste Management Plan shall be given in all the ESZ- Draft ZMP.

The meeting ended with a vote of thanks to the chair.



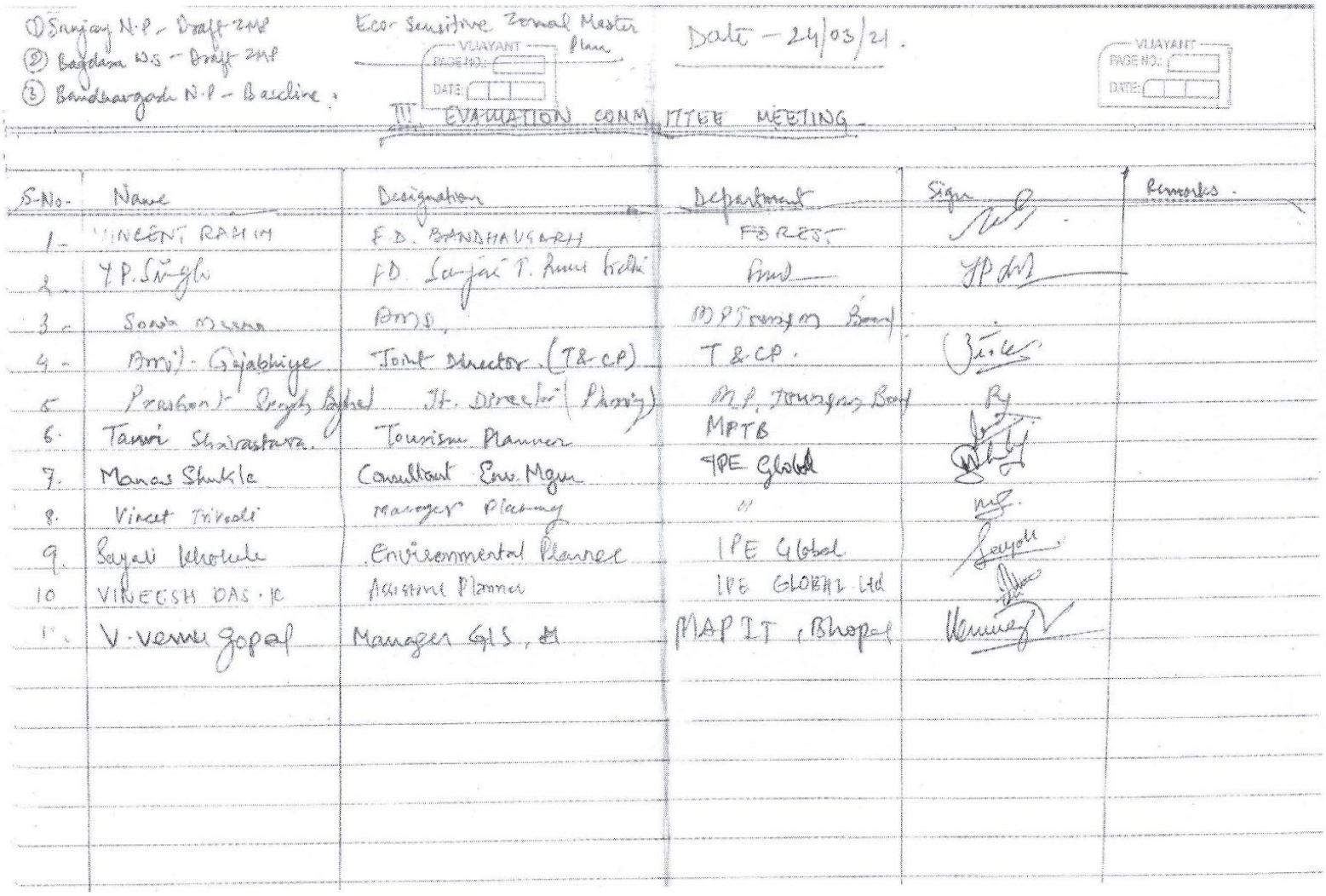
① Satpura NP – Final Draft ZMP
② Pench NP – Executive
③ Jeerashm NP – Draft ZMP

VIJAYANT PAGE NO: DATE

Date – 23/3/21

III Evaluation committee meeting
Eco-Sensitive Zonal Master Plan

S.No.	Name	Designation	Department	Sign	Remarks
1.	Tanvi Shrivastava	Tourism Planner	MPTB		
2.	Sh. M.S. Negi	Addl. PCCF (Wildlife)	Forest		
3.	Mr. L. Krishnamurthi	Field Director	Satpura N.P. Forest		
4.	Ms. Sonia Meena	Addl. Managing Director	MPSTB		
5.	Dr. Sanjeev Sachdeva	Chief Executive officer	BPCD		
6.	Sh. Vikram Singh Parihar	Field Director	Pench N.P. Forest		
7.	Sh. V. VENUGOPAL	Manager GIS, MAPIT	MAPIT		
8.	Prem Lata Singh Baghel	Jt. Director Planning	MPSTB		
9.	Mr. Ram Joshi	Team leader	SAI consulting Engg.		
10.	Mr. Kunal Rana	Urban planner	"		
11.	Mr. Nitin Thakur	Urban planner	"		
12.	Virendra Kumar	Sr VP	feedback Infra		
13.	Karishma Prasad	Dy Manager	"	Karishya	
14.	Mr. Rajesh Kumar Singh	DCF (ET)	Forest		
15.	Mr. Madhu V. Raj (DFO Tourism)	DFO Jeerashm N.P.	Forest		Joined online on Google meet.



1) Sanjay N.P. – Draft 2nd
2) Bagdara W.S – Draft 2nd
3) Bandhavgarh N.P – Baseline.

Eco-Sensitive Zonal Master Plan

Date – 24/03/21.

III EVALUATION COMMITTEE MEETING

S-No.	Name	Designation	Department	Sign	Remarks
1.	VINCENT RAHIM	F.D. BANDHAVGARH	FOREST		
2.	Y.P. Singh	FD Sanjay T. Rani Sidhi	Forest	YP Singh	
3.	Sonia Meena	DMO	MP Tourism Board		
4.	Bmj) - Gajabhiye	Joint Director (T&CP)	T&CP.		
5	Prashant Singh Baghel	Jt. Director (Planning)	MP Tourism Board		
6.	Tanvi Shivastava.	Tourism Planner	MPTB		
7.	Manas Shukla	Consultant Env. Mgm	IPE Global		
8.	Vinit Trivedi	manager Planning	"		
9.	Sayali Ithole	Environmental Planner	IPE Global		
10	VINEESH DAS. P	Assistant Planner	IPE GLOBAL Ltd		
11.	V. Venu Gopal	Manager GIS, M	MAP IT, Bhopal		

Table Error! No text of specified style in document.**-2 : Compliance Report- Evaluation Committee Meeting**

Compliance for comments received during Evaluation Committee Meeting for Baseline Assessment report of ESZ of PTR on 23/03/2021		
Sr No	**Comments/ Suggestions from Evaluation Committee**	**Remarks**
1	For poaching & illegal fishing data, please check & contact F.D. Pench. Data for year 2019- 2020 & 2021.	The data incorporated was received from the office of Pench Tiger Reserve vide email dated 14/06/2021 in reply of our letter no.SAI/BAUP219009/HO/0957/2021 dated 08/06/2021 to varify the updated data. The same has been incorporated in section 4.8.2. (Page No. 71)
2	Check data till 2021 for worker profile in section "Settlements in ESZ"	Noted. The authenticated data for working profile is available only for year 2011 as per Census. To understand the worker profile at local level and to understand the existing situations, we have conducted primary consultations and surveys with local villagers, Government officials and other stakeholders reffred in annexure 2.1 and 2.2. (Page no. 273 and 314) The same has been discussed locally during the stakeholder consultation meeting held on 11th February, 2021 at Karmajhiri chaired by the Divisional Commissioner, Jabalpur.
3	Masurnala has to be added into identified activity routes.	Noted. To be incorporated in Draft stage.
4	Mention Tourist footfall data of 2021	Noted. Tourist footfall data was collected in March 2020 during primary consultations and survey. The data for year 2020 and 2021 can be misguiding to understand trend of tourism as study area was under lockdown in view of covid-19.
5	Carrying Capacity for accommodation has to be rechecked. Mention number of beds instead of rooms. Take updated data for no. of rooms from F.D' Pench.	Noted. Total Numbers of bed is mentioned in section 6.5 of Chapter 6 in the Baseline Assessment Report (Page No. 171). The occupancy rate data has been received from Madhya Pradesh Tourism Board. The consultant used the same for analysis of occupancy rate.(Page No. 192)

1.2.9.3 Evaluation of Draft Zonal Master Plan (Part-2)

1.2.9.3.1 Stakeholder Consultation and Monitoring Committee meetings

The agenda of the meeting was to share this study with stakeholders and local people and getting feedbacks and inputs from them. The minutes of the meeting for Monitoring Committee is as follows:

कार्यालय मुख्य वनसंरक्षक एवं क्षेत्र संचालक,
पेंच टाईगर रिजर्व, सिवनी (म.प्र.)

Phone - 07692-223794, Fax-07692-223204, www.penchtiger.co.in, e-mail- fdpennp.snt@mp.gov.in

क्रमांक/मा.चि./ सिवनी/दिनांक/

प्रति,

01. कलेक्टर
सिवनी/छिन्दवाड़ा
02. मुख्य कार्यपालन अधिकारी,जिला पंचायत सिवनी/छिन्दवाड़ा
03. क्षेत्रीय प्रबंधक, मध्यप्रदेश राज्य पर्यटन विकास निगम, जबलपुर संभाग
04. क्षेत्रीय अधिकारी, मध्यप्रदेश प्रदूषण नियंत्रण बोर्ड जबलपुर संभाग
05. कार्यपालन यंत्री लोक स्वास्थ्य यांत्रिकी सिवनी /छिन्दवाड़ा
06. कार्यपालन यंत्री सिं चाई एवं बाढ़ नियंत्रण सिवनी/छिन्दवाड़ा
07. कार्यपालन यंत्री लोक निर्माण विभाग,सिवनी /छिन्दवाड़ा
08. उप संचालक, कृषि एवं उद्यानिकी विभाग सिवनी/छिन्दवाड़ा
09. अनुविभागीय अधिकारी राजस्व, कुरई/चौरई
10. उप संचालक, नगर एवं ग्राम निवेश छिन्दवाड़ा
11. अधीक्षक भू–अभिलेख सिंचाई एवं बाढ़ नियंत्रण कक्ष, सिवनी/छिन्दवाड़ा

विषय : **इको सेंसटिव जोन की मानीटरिंग कमेटी की बैठक दिनांक 07.01.2022 का कार्यवाही विवरण।**

संदर्भ :– कार्यालय कमिश्नर जबलपुर संभाग जबलपुर का कार्यालयीन पत्र क्रमांक/13/समन्वय शाखा/2022 जबलपुर दिनांक 31.01.2022

–0–

विषयांकित संदर्भ में लेख है कि पेंच टाइगर रिजर्व, सिवनी के ईको सेन्सटिव जोन मानीटरिंग कमेटी की बैठक आयुक्त जबलपुर संभाग की अध्यक्षता में दिनांक 07 जनवरी 2022 आयोजित की गयी थी। उक्त बैठक का अनुमोदित कार्यवाही विवरण संलग्न कर प्रेषित है, कृपया पालन प्रतिवेदन प्रेषित करने का कष्ट करें।

संलग्न – उपरोक्तानुसार।

सही

सदस्य सचिव
ईको सेंसटिव जोन मानीटरिंग कमेटी
एवं
मुख्य वन संरक्षक एवं क्षेत्र संचालक,
पेंच टाइगर रिजर्व, सिवनी (म.प्र.)

पृ. क्रमांक/मा.चि./513 सिवनी/दिनांक/31/2/22

प्रतिलिपि – 01. संभागायुक्त जबलपुर संभाग जबलपुर की ओर सूचनार्थ प्रेषित।
03. कर्नल के. जोशी सांई सत्या ग्रुप सांई कन्सलटिंग इंजीनियर्स प्राइवेट लिमिटेड, ब्लाक "ए" सांई हाउस, सत्यम कार्पोरेट स्केयर, राजपथ क्लब के पीछे, बोदकदेव, अहमदाबाद– 380059 की ओर सूचनार्थ अग्रेषित।

संलग्न – उपरोक्तानुसार।

सदस्य सचिव
ईको सेंसटिव जोन मानीटरिंग कमेटी
एवं
मुख्य वन संरक्षक एवं क्षेत्र संचालक,
पेंच टाइगर रिजर्व, सिवनी (म.प्र.)

Preparation of ZMP for ESZ for Cluster 4 MP- Minutes of the Meeting

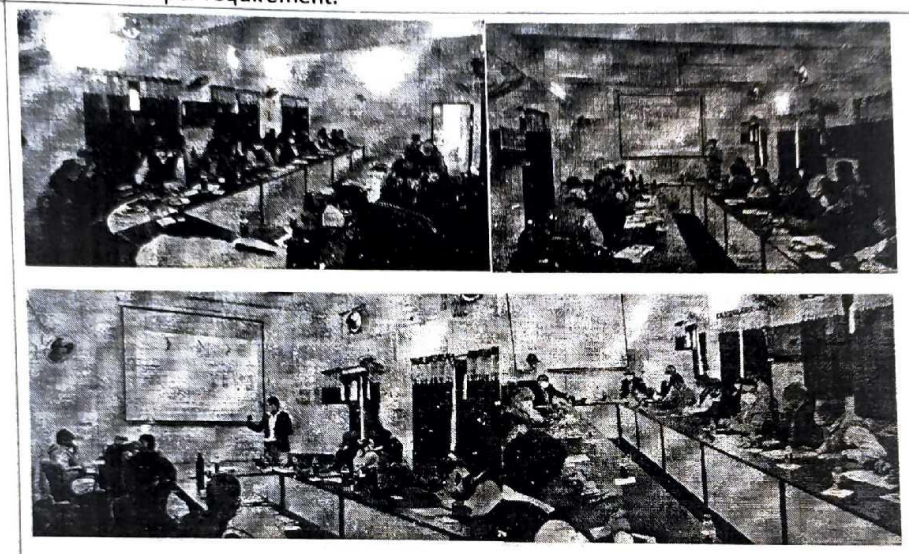
Subject	**Minutes of the Meeting for Preparation of Zonal Master Plan and Sub- Zonal Tourism Master Plan for Eco-Sensitive Zone (ESZ) listed in Cluster 4 (Pench Tiger Reserve (PTR)) of Madhya Pradeshwith Notified Monitoring Committee and other Stakeholders**	
Meeting Date	7th January 2022	
Place	Eco Center, Karmajhiri, Pench Tiger Reserve, Madhya Pradesh	
Participants	***From Stakeholder/ Monitoring Committee***	***From SAI Consulting Engineers Pvt. Ltd.***
	The Divisional Commissioner, Jabalpur Division The Field Director, Pench Tiger Reserve The Deputy Field Director, Pench Tiger Reserve The District Collector, Seoni The Chief Executive Officer, Jilla Panchayat, Seoni The Regional Manager, Madhya Pradesh Tourism The Deputy Director (Agriculture) The Assistant Director (Horticulture and Food Processing) The Senior Scientist, Madhya Pradesh Pollution Control Board, Jabalpur Representatives from Environmental NGO The Joint Commissioner, Jabalpur Division The Public Relation Officer The SDM, Kurai Representatives from PHE and PWD Representative from State Land Record	Mr. Kewal Rana, Urban Planner Mr. Nisarg Thanki, Urban Planner

S. No.	Points Discussed/suggestions made
1.	The Stakeholder Consultation Meeting wasorganized for presentation of Draft Zonal Master Planfor Eco Sensitive Zone of Pench Tiger Reserve vide letter no. 6609 from the office of the Field Director, Pench Tiger Reserve, Seoni dated 27th December2021. Accordingly meeting was organized at Karmajhiri with all concerned stakeholder, Monitoring Committee on 7th January 2022at1:30 P.M.Team of SAI Consulting Engineers Pvt.Ltd. – A Systra group Company presented the proposals ofDraft Zonal Master Plan for Eco Sensitive Zone of Pench Tiger Reserve to all the concerned stakeholders, members of monitoring committee and staff of forest department during the meeting.
2.	A brief introduction about work plan, the methodology adopted, and components of Zonal Master Plan was presented in the meeting. The detailed presentation coveringproposals coveringDraft Zonal Master Plan for Eco Sensitive Zone of Pench Tiger Reservei.e. Proposed Land Use Land Cover, Development Control Regulations, Traffic and Transportation, Sub Zonal Tourism Master Plan, Livelihood and local economy, Conservation, Physical and Social infrastructure were discussed in detail during above said stakeholder consultation.
3.	The Divisional Commissioner suggested to include a section named as"Definitions"fordefining major technical terms.
4.	The Divisional Commissioner suggested to provide identification numbers to waterbodies and provide a table for the same mentioning type, area and coordinates during discussion of proposed buffer area in proposed land-use land cover.

5.	A brief discussion was carried out regarding environmental safeguard criteria for camping. It was suggested that provision of camping site shall be modified to more than 1000 m from core boundary instead of 150 m.
6.	During brief discussion for Proposed Land-use Land cover of Eco- Sensitive Zone of Pench Tiger Reserve, it was suggested that Public and Semi-public Amenities should be permissible in all the land-use categories. It was further discussed that the proposed land-use land cover shall not restrain the development activities pursued by the local people.
7.	In further discussion regarding proposed land-use land cover, it was pointed out that all the proposed land-use land cover of Eco Tourism and Industrial categories shall be proposed beyond 1 km boundary from core. Further adding to the same, it is suggested that all the tourism activities should be proposed beyond 1 km boundary of core zone.
8.	Additionally, the Development Control Regulation Guidelines were discussed in depth. It was suggested that the regulations should not be restrictive for residential and commercial activities(C1) for locals. It was further added that the generalized guidelines should be providedfor rural development.
9.	It was discussed during the meeting that activities that includes brick kiln process shall be shifted outside the ESZ area considering livelihood dependency of the villagers over a period of time.
10.	The proposals for the traffic and transportation and conservation mitigations for linear infrastructure were briefly discussed during the meeting. It was suggested by the Divisional Commissioner and the Field Director, PTR to modify mentioned below criteria for conservation mitigations for linear infrastructure. • Criteria to provide speed breakers should be modified from 5 – 9 km to 1 – 3 km for Turia clusters and accordingly to that change the other criteria of wildlife passages.
11.	During the discussion on the proposals for silence zone, the Divisional Commissioner agreed that the noise is one of the major disturbance factors for wildlife. It was suggested that the norm has to be modified for noise pollution changing from 40dB to 70 dB as 70dB noise for mechanical instruments are more feasible. In further discussion, it was concluded that the noise shall not exceed to 70dB beyond the periphery of hotels and resorts as well it is only permissible within indoor structures with noise reduction techniques.
12.	A brief discussion took place for providing guidelines pertaining to design and construction of roads. Finally, it was concluded that EIA should only be carried out for providing Tar and Pucca Road only and shall be exempted for gravel and WBM roads.
13.	The components for the sub zonal tourism master plan have been discussed briefly in the meeting. The following points have been suggested. • Extension of safari route for proposed safari of Sakata till Chandarpur. It was also suggested that Nallair eco-tourism area to be mentioned as existing tourism site. • The Field Director suggested to modify the carrying capacities for proposed safari of Sakata. • In further discussion, it was suggested to promote herbal Park instead of Arboretums. • It was suggested to mention for permissible development of tourism sites/ activities other than proposed tourism sites / activities with consent of office of Local Area Committee.
14.	The proposals for livelihood and rural economy have been discussed briefly with the members of Monitoring Committee. It was suggested that there should be more emphasis on promoting the Sitafal (Custard apple) as one of major product of horticulture of ESZ area. It was also suggested that pottery shall be promoted as part of rural tourism.
15.	The proposals for Conservation measures including proposals for water, soil, forest etc. It was suggested that promotion of local species like Arjun and Jamun can be beneficial for riparian buffer and shall be included in the report.

Page2

Preparation of ZMP for ESZ for Cluster 4 MP- Minutes of the Meeting

16.	For strengthening the governance process, proposed institutional framework was discussed during the meeting. institutional framework Proposed by the consultant should be indicative only. It was discussed that the same will be finalized by the Monitoring committee as per requirement.
17.	

The meetings ended with vote of thanks.

(आयुक्त द्वारा अनुमोदित)

(अरविंद यादव)
संयुक्त आयुक्त (विकास)
जबलपुर संभाग, जबलपुर

क्षेत्र संचालक
पेंच टाईगर रिजर्व, सिवनी (म.प्र.)

Figure Error! No text of specified style in document.**-2 : Photographs from the stakeholder's consultation meeting**

These valuable suggestions/ comments mentioned in Minutes of Meeting above were incorporated in baseline assessment study report. The compliance report for the same is as below.

Table Error! No text of specified style in document.**-3 : Compliance Report- Monitoring Committee Meeting**

S. No.	Points Discussed/suggestions made	Remarks
1	The Divisional Commissioner suggested to include a section named as "Definitions" for defining major technical terms.	Noted. Incorporated in section 9.4. (Page No.01)
2	The Divisional Commissioner suggested to provide identification numbers to waterbodies and provide a table for the same mentioning type, area and coordinates during discussion of proposed buffer area in proposed land-use land cover.	Noted. Incorporated in Annexure 11.4 of Part -3. (Page No. 147)
3	A brief discussion was carried out regarding environmental safeguard criteria for camping. It was suggested that provision of camping site shall be modified to more than 1000 m from Protected boundary instead of 150 m.	Noted. Incorporated in section 10.4.2. (Page No.47)
4	During brief discussion for Proposed Land-use Land cover of Eco-Sensitive Zone of Pench Tiger Reserve, it was suggested that Public and Semi-public Amenities should be permissible in all the land-use categories. It was further discussed that the proposed land-use land cover shall not restrain the development activities pursued by the local people.	Noted. Incorporated in section 10.4.2. (Page No.47)
5	In further discussion regarding proposed land-use land cover, it was pointed out that all the proposed land-use land cover of Eco Tourism and Industrial categories shall be proposed beyond 1 km boundary from protected area. Further adding to the same, it is suggested that all the tourism activities should be proposed beyond 1 km boundary of protected zone.	Noted. Incorporated in section 10.4.2. (Page No. 47)

S. No.	Points Discussed/suggestions made	Remarks
6	Additionally, the Development Control Regulation Guidelines were discussed in depth. It was suggested that the regulations should not be restrictive for residential and commercial activities(C1) for locals. It was further added that the generalized guidelines should be provided for rural development.	Noted. Development Control Regulation guidelines has been proposed in line with RADPFI guidelines for rural areas.
7	It was discussed during the meeting that activities that includes brick kiln process shall be shifted outside the ESZ area considering livelihood dependency of the villagers over period of time.	Noted. Incorporated in section 10.4.1. (Page No.46)
8	The proposals for the traffic and transportation and conservation mitigations for linear infrastructure were briefly discussed during the meeting. It was suggested by the Divisional Commissioner and the Field Director, PTR to modify mentioned below criteria for conservation mitigations for linear infrastructure. · Criteria to provide speed breakers should be modified from 5 – 9 km to 1 – 3 km for Turia clusters and accordingly to that change the other criteria of wildlife passages.	Noted. Incorporated in section 11.10.5 and 11.10.7. (Page No.180 and 181)
9	During the discussion on the proposals for silence zone, the Divisional Commissioner agreed that the noise is one of the major disturbance factors for wildlife. It was suggested that the norm has to be modified for noise pollution changing from 40dB to 70 dB as 70dB noise for mechanical instruments are more feasible. In further discussion, it was concluded that the noise shall not exceed to 70dB beyond the periphery of hotels and resorts as well it is only permissible within indoor structures with noise reduction techniques.	Noted. Incorporated in section 11.10.8. (Page No.184)
10	A brief discussion took place for providing guidelines pertaining to design and construction of roads. Finally, it was concluded that EIA should only be carried out for providing Tar and Pucca Road only and shall be exempted for gravel and WBM roads.	Noted. Incorporated in section 11.10.9(2). (Page No.185)
11	The components for the sub zonal tourism master plan have been discussed briefly in the meeting. The following points have been suggested. 1. Extension of safari route for proposed safari of Dharam Kua till Chandarpur. It was also suggested that Nallair eco-tourism area to be mentioned as existing tourism site. 2.The Field Director suggested to modify the carrying capacities for proposed safari of Dharam Kua. 3.In further discussion, it was suggested to promote herbal Park instead of Arboretums. 4.It was suggested to mention for permissible development of tourism sites/ activities other than proposed tourism sites / activities with consent of office of Local Area Committee.	1. Noted. Incorporated in section 13.3.1 and 13.2.1. (Page No.281 and 276) 2. Noted. Incorporated in section 13.7.3. (Page No.300) 3. Already proposed in section 10.6.2. (page No.84) 4. Noted. Incorporated in section 10.4.1. (Page No.46)
12	The proposals for livelihood and rural economy have been discussed briefly with the members of Monitoring Committee. It was suggested that there should be more emphasis on promoting the Sitafal (Custard apple) as one of major product of horticulture of ESZ area. It was also suggested that pottery shall be promoted as part of rural tourism.	Noted. Incorporated in section 12.3.2. (Page No.252)

S. No.	Points Discussed/suggestions made	Remarks
13	The proposals for Conservation measures including proposals for water, soil, forest etc. It was suggested that promotion of local species like Arjun and Jamun can be beneficial for riparian buffer and shall be included in the report.	Noted. Incorporated in section 11.14.1. (Page No.190)
14	For strengthening the governance process, proposed institutional framework was discussed during the meeting. institutional framework Proposed by the consultant should be indicative only. It was discussed that the same will be finalized by the Monitoring committee as per requirement.	Noted. Incorporated in section 15.2. (Page No.311)

1.2.9.3.2 Monitoring Committee meeting

The Evaluation committee meeting was held on date 23rd March 2021 at office of Madhya Pradesh Tourism Board, Bhopal.

The attendees of meeting and Minutes of Meetings for the same is as below.

Madhya Pradesh Tourism Board

Bhopal

Date-31/03/2022

Minutes of Meeting

Please find enclosed herewith duly approved minutes of **Fifth Evaluation Committee meeting** held on 11th March 2022 for **'Preparation of Zonal Master Plan for Eco-Sensitive Zones of National Parks/ Wildlife Sanctuaries of M.P.'** for information and necessary action.

29/3/22
Managing Director

To,

1. Mr. Ashok Barnwal, Principal Secretary, Forest, Bhopal
2. Mr. J.S. Chouhan, PCCF, Wildlife, Bhopal
3. Mrs. Kamalika Mohanta, CCF, Ujjain
4. Mr. Pradeep Vasudeva, CCF, Jabalpur
5. Dr. Amit Gajbhiye, Joint Director, Directorate of Town and Country Planning, Bhopal
6. Mr. Alok Nayak, Senior Scientific Officer, EPCO Bhopal
7. Mr. V. Venugopal (Nodal Officer), Manager GIS, MAP-IT Department, Bhopal
8. Mr. Ashok Kumar Mishra, Field Director, Pench Tiger Reserve, Seoni, M.P.
9. Mr. Sahil Garg, Divisional Forest Officer, Fossil National Park, Dindori, M.P.
10. Mr. Adarsh Shrivastava, Divisional Forest Officer, Gandhisagar Wildlife Sanctuary, Mandsaur, M.P.
11. Mr. Devesh Mishra, Divisional Forest Officer, Kheoni Wildlife Sanctuary, Dewas, M.P.
12. Mr. Karn Joshi, Team Leader, M/s Sai Consulting Engineers Pvt. Ltd., Ahmedabad
13. Mr. Virendra Kumar, Sr. Vice President, M/s Feedback Infra Pvt. Ltd., Gurugram
14. Mr. Kaustubh Kurlekar, Manager, Sr. General Manager, M/s Aakar Abhinav Consultants Pvt. Ltd., Mumbai.

29/3/22
Managing Director

PROCEEDINGS OF THE EVALUATION COMMITTEE MEETING FOR DRAFT ZONAL MASTER PLAN/ BASELINE STUDY

Evaluation Committee meeting for 'Preparation of Zonal Master Plan for Eco-Sensitive Zones of National Parks/ Wildlife Sanctuaries of M.P.' was held on 7th and 8th September 2021 under the chairmanship of Mrs. Shilpa Gupta, Additional Managing Director, MPTB, Bhopal and in the presence of Mr. Sheo Shekhar Shukla, Managing Director, MPTB.

LIST OF PARTICIPANTS

Evaluation Committee Members

1. Mr. Sheo Shekhar Shukla, Principal Secretary Tourism and Managing Director, MPTB.
2. Mr. Ashok Barnwal, Principal Secretary, Forest, Bhopal
3. Mr. J.S. Chouhan, PCCF, Wildlife, Bhopal
4. Mrs. Shilpa Gupta, Additional Managing Director, MPTB (Chairperson)
5. Mrs. Kamalika Mohanta, CCF, Ujjain
6. Mr. Pradeep Vasudeva, CCF, Jabalpur
7. Dr. Amit Gajbhiye, Joint Director, Directorate of Town and Country Planning, Bhopal
8. Mr. Alok Nayak, Senior Scientific Officer, EPCO Bhopal
9. Mr. Faizaan Rasheed, Project Manager, EPCO Bhopal
10. Dr. Neetu Malik, PF, EPCO Bhopal
11. Mr. V Venugopal (Nodal Officer), Manager-GIS, MAP-IT Department, Bhopal
12. Mr. Ashok Kumar Mishra, Field Director, Pench Tiger Reserve, Seoni, M.P.
13. Mr. Sahil Garg, Divisional Forest Officer, Fossil National Park, Dindori, M.P.
14. Mr. Adarsh Shrivastava, Divisional Forest Officer, Gandhisagar Wildlife Sanctuary, Mandsaur, M.P.
15. Mr. Devesh Mishra, Divisional Forest Officer, Kheoni Wildlife Sanctuary, Dewas, M.P.

Representatives from Madhya Pradesh Tourism Board, Bhopal

1. Mr. Sheo Shekhar Shukla, Managing Director
2. Mrs. Shilpa Gupta, Additional Managing Director (Chairperson)
3. Mr. Prashant Singh Baghel, Joint Director (Planning)

Representatives from M/s Sai Consulting Engineers Pvt. Ltd., Ahmedabad

1. Mr. Karn Joshi, Team Leader
2. Mr. Nisarg Thanki, Urban Planner
3. Mr. Jagdish Chandra, Forest Consultant

Representatives from M/s Feedback Infra Pvt. Ltd., Gurugram

1. Mr. Virendra Kumar, Sr. Vice President
2. Ms. Karishma Prasad, Dy. Manager
3. Ms. Nandini Choudhary
4. Mr. S.R.K. Varshney

Representatives from M/s Aakar Abhinav Consultants Pvt. Ltd., Mumbai.

1. Mr. Kaustubh Kurlekar, Manager, Sr. General Manager
2. Mr. Shubhankar Nag, Urban Planner

The softcopy of the Draft Zonal Master Plan/ Baseline Study was already sent to the evaluation committee members by mail. The presentations were made by the consultants on their Draft Zonal Master Plan/ Baseline Study to present it in the meeting. Evaluation committee members analyzed the studies on the basis of scope of work and framework provided to them for the 'Preparation of Zonal Master Plan for the Eco-Sensitive Zones of National Parks/ Wildlife Sanctuaries of M.P.' and they provided their inputs and suggestions.

1. **Presentation by M/s Aakar Abhinav Consultants Pvt. Ltd., Mumbai. on Baseline study of Gandhisagar Wildlife Sanctuary (Cluster-3)**

The Evaluation Committee recommended that:

a. AACPL presented the Baseline report presentation of Gandhisagar WLS ESZ to the evaluation committee.
b. AACPL highlighted the differences between the MOEFCC notified villages of the ESZ and the villages as per the latest data received from APCCF IT and MAPIT. The evaluation committee informed Forest Department to verify the said differences and share any update if necessary.
c. The Evaluation Committee informed that the focus shall be on the developments near two gates Bhanpura and Navali. AACPL informed that they shall include the same in the ZMP reports.
d. The evaluation committee recommended that the proposals regarding the Solid waste management needs to be given. AACPL informed that they shall include the same in the ZMP reports.
e. The evaluation committee informed that the focus of the ZMP shall be on new tourism products and identification of new tourism circuits. AACPL informed that they shall include the same in the ZMP reports.
f. Interventions shall be proposed near both the gates of the sanctuary.
g. The evaluation committee directed that the Draft ZMP report for Gandhisagar should be submitted by 11th April 2022.

2. **Presentation by M/s Aakar Abhinav Consultants Pvt. Ltd., Mumbai. on Baseline study of Kheoni Wildlife Sanctuary (Cluster-3)**

The Evaluation Committee recommended that:

a. AACPL presented the Baseline report presentation of Kheoni WLS ESZ to the evaluation committee.
b. AACPL highlighted the differences between the MOEFCC notified villages of the ESZ and the villages as per the latest data received from APCCF IT and MAPIT. The evaluation committee informed Forest Department to verify the said differences and share any update if necessary.
c. The evaluation committee recommended addition of Sawalipahad in the ZMP proposals, in the tourist circuit. AACPL informed that they shall include the same in the ZMP reports.

d. The evaluation committee recommended that Dolatpur should be promoted as an entrance gate, and further include proposals in Gandhisagar colony. AACPL informed that they shall include the same in the ZMP reports.
e. The evaluation committee informed that the focus of the ZMP shall be on new tourism products and identification of new tourism circuits. AACPL informed that they shall include the same in the ZMP reports.
f. The evaluation committee directed that the Draft ZMP report for Kheoni should be submitted by 11th April 2022.

3. **Presentation by M/s Feedback Infra Pvt. Ltd., Gurugram on Draft Zonal Master Plan of Fossil National Park (Cluster-2)**

The Evaluation Committee recommended that:

a. Since the petrified fossils are the USP of Jeevashm Fossil NP, suggest and focus more on tourist activities related to viewing and experiencing the fossils and related interventions may also be proposed.
b. In Fossil NP-2 focus should be on preservation & protection of fossils. Tourist activities in Fossil Park-1 only.
c. Geological mapping of surrounding area shall be included.

4. **Presentation by M/s Sai Consulting Engineers Pvt. Ltd., Ahmedabad on ~~Baseline study of~~ Draft Zonal Master Plan of Pench Tiger Reserve (Cluster-4)**

The Evaluation Committee recommended that:

a. The Evaluation Committee Meeting was organized for discussion on proposals prepared for Draft Zonal Master Plan of Eco Sensitive Zone of Pench Tiger Reserve at Vallabh Bhavan, Bhopal, Madhya Pradesh. Team of SAI Consulting Engineers Pvt. Ltd. – A Systra group Company discussed all the proposals prepared for Eco Sensitive Zone of Pench Tiger Reserve with all the dignitary members during the meeting.

b. The chapter of traffic and transportation briefly discussed in the meeting. It was suggested to replace the roads of 12 m cross-sections with 9 m cross-section. The consultant replied that the carriage way is proposed for 9 m only and additional space is for infrastructure purpose like street-light, wildlife passages and water drains.

c. In section of conservation measures, it was suggested to propose buffer categories as per stream order and area of waterbodies. The team of consultant replied that the criteria for provision of buffer to waterbodies are proposed according to stream order and area of waterbodies. The same has already been mentioned in chapter 11 of the Draft Zonal Master Plan Reports.

d. The Sub-Zonal Master Plan for tourism activities was briefly discussed during the meeting and following suggestions receive:

1. A broad discussion took place regarding provision of camping sites in 1 km of no permanent construction for commercial purpose. The Divisional Commissioner recommended that the camping may promote the various other activities, which will result to disturbance to wildlife. The Principal Secretaries and the PCCF agreed to the same.
2. A suggestion to include innovative activities like bird walking, nature walk, river walking/ trekking activities near Bawanthadi river in Sakata cluster. These (innovative activities) shall be proposed in the ZMP report.
3. It was also suggested for consideration of ongoing tourism related activities by Village Camp organization in Pench Tiger Reserve.
4. A list of tourism activities to be provided in the Draft Zonal Master Plan.

e. A detailed discussion was carried out for analysis and proposal of Dark Night Conservation in Pench Tiger Reserve. It was suggested to incorporate the latest data for analysis, if available.

f. A suggestion for inclusion of Key Performance Indicators and other indicators in the Draft Zonal Master Plan for Pench Tiger Reserve. The team of consultant replied that it has already been incorporated in Chapter 10 of Part-2 of the Draft Zonal Master Plan reports.

g. The Principal Secretary (Tourism) recommended that the procedure for finalization of Draft Zonal Master Plan shall be completed by 10th April 2022.

5

Date - 10/03/2022. PREPARATION OF ZONAL MASTER PLAN.

FIFTH EVALUATION COMMITTEE MEETING. - Pench (DZMP), Jeevashm (DZMP), Gandhisagar & Kheoni (Baseline)

S.No.	Name	Designation	Dept	Signature	Remark
1.	Shri. Sheo Shekhar Shukla	PS Tourism			
2.	Shri. Ashok Barnwal	PS forest.			
3.	Smt. Shilpa Gupta	AMD, MPTB.			
4.	Shri. J.S. Chouhan	PCCF wildlife			
5.	Shri. Shubhranjan Sen	A PCCF wildlife.			
6.	V. Venugopal	MPSEDC (MAPIT)	for CO, Bhopal		
7.	Fouzan Rasheed	E.P. ... Bhopal			
8.	Prashant Singh Baghel	Joint Dir. Planning	MP Tourism Board		
9.	Alok Nayak. Sr. Scientific Officer	Sr Scientific Officer	EPCO Bhopal		
10.	Adarsh Shrivastava	DFO Mandala			
11.	Ashok Kumar Mishra	Field Director Pench TR	Forest.		
12.	Kamalika Mohanta	APCCF Ujjain	Forest.		
13.	Shri J.S. Chauhan	CWLW	Forest.		
14.	Satyanand	CEO, MP Ecotourism Board,	Forest		
15.	Dr Amit Gajbhiye	JD T&CP	T&CP		
16	Sahil Garg	DFO DINDORI	Forest		
17	Subhankar Nag	AAKAR ABHINAV CONSULTANTS			
18	Kaustubh Kurlekar.	AAKAR ABHINAV	Consultants		
19.	Dr.S.R.K. Varshney	Consultant, Urifra Facility	Consultant		
20	Nandini Choudhary	Consultant, Feedback Infra	Consultant		
21	VIRENDRA KUMAR	-do-	-do-		
22.	Kavishma Prasad	"	"		
23.	Jagdish chandra IFS(R)	Retd. CF (Forest)	SAI consultant		
24.	Devesh Mishra	DFO Dewas	Forest.		
30.	Karan Joshi	Team leader	SAI consultant		
31.	Nisarg Thanki	Urban Planner	"		
32.	Jagdish Chandra	Forest consultant	"		

6

Table Error! No text of specified style in document.**-4 : Compliance Report- Evaluation Committee Meeting**

No.	Points	Remarks
a	The Evaluation Committee Meeting was organized for discussion on proposals prepared for Draft Zonal Master Plan of Eco Sensitive Zone of Pench Tiger Reserve at Vallabh Bhavan, Bhopal, Madhya Pradesh. Team of SAI Consulting Engineers Pvt. Ltd. — A Systra group Company discussed all the proposals prepared for Eco Sensitive Zone of Pench Tiger Reserve with all the dignitary members during the meeting.	Noted.
b	The chapter of traffic and transportation briefly discussed in the meeting. It was suggested to replace the roads of 12 m cross-sections with 9 m cross-section. The consultant replied that the carriage way is proposed for 9 m only and additional space is for infrastructure purpose like street-light, wildlife passages and water drains.	Noted and already mentioned in section 11.10.1 of Chapter 11 in Part-2 of Draft Zonal Master Plan. (Page-176)
c	In section of conservation measures, it was suggested to propose buffer categories as per stream order and area of waterbodies. The team of consultant replied that the criteria for provision of buffer to waterbodies are proposed according to stream order and area of waterbodies. The same has already been mentioned in chapter 11 of the Draft Zonal Master Plan Reports.	Noted. The criterias are mentioned in Section 10.5 of Chapter 10 in Part-2 of Draft Zonal Master Plan. (Page-74)
d.1	The Sub-Zonal Master Plan for tourism activities was briefly discussed during the meeting and following suggestions received: A broad discussion took place regarding provision of camping sites in 1 km of no permanent construction for commercial purpose. The Divisional Commissioner recommended that the camping may promote the various other activities, which will result to disturbance to wildlife. The Principal Secretaries and the PCCF agreed to the same.	Noted.
d.2	A suggestion to include innovative activities like river walking/ trekking activities near Bawanthadi river in Dharam Kua cluster. These (innovative activities) shall be proposed in the ZMP report.	Noted. Incorporated in Section 13.3.2 of Chapter 13 in Part-2 of Draft Zonal Master Plan. (Page-283 to 285)
d.3	It was also suggested for consideration of ongoing tourism related activities by Village Camp organization in Pench Tiger Reserve.	Noted. The activities already considered in Section 5.3 of Chapter 5 in Part 1 of Draft Zonal Master Plan. (Page-168 to 175)
d.4	A list of tourism activities to be provided in the Draft Zonal Master Plan.	Noted. Already mentioned in Table-13.12 in Section 13.8 of Chapter 13 in Part-2 of Draft Zonal Master Plan. (Page-307)
e	A detailed discussion was carried out for analysis and proposal of Dark Night Conservation in Pench Tiger Reserve. It was suggested to incorporate the latest data for analysis, if available.	Noted. Recent available data has been analyzed and incorporated accordingly in Section 11.15.5 of Chapter 11 in Part-2 of Draft Zonal Master Plan. (Page-218)
f	A suggestion for inclusion of KPIs and other indicators in the Draft Zonal Master Plan for Pench Tiger Reserve. The team of consultant replied that it has already been incorporated in Chapter 10 of Part-2 of the Draft Zonal Master Plan reports.	Noted. Already mentioned in Section 7.9 of Chapter 7 in Part-1 of Draft Zonal Master Plan. (Page-226 to 238)

No.	Points	Remarks
g	The Principal Secretary (Tourism) recommended that the procedure for finalization of Draft Zonal Master Plan shall be completed by 10th April 2022.	Noted.

1.2.9.4 Comments Received From Various Departments

The different sections of the draft zonal master plan have been shared with various departments vide letters mentioned below by Madhya Pradesh Tourism Board for review and comments. The same letters have been annexed in annexure 17.1.

Table Error! No text of specified style in document.**-5 : Letters send to various departments by Madhya Pradesh Tourism Board**

Sr No.	Letter No.	Date	Section of Draft Zonal Master Plan	Departments
1	2445/PLG/MPTB/2022	20/04/2022	Section for Conservation	Water Resource Department
2	2453/PLG/MPTB/2022	20/04/2022	Section for Tourism	Madhya Pradesh Ecotourism Development Board
3	2462/PLG/MPTB/2022	20/04/2022	Section for Agriculture and Livelihood	State Rural Livelihood Mission
4	2450/PLG/MPTB/2022	20/04/2022	Section for Conservation	Department of Archaeology Archives and Museums
5	2464/PLG/MPTB/2022	20/04/2022	Section for Agriculture and Livelihood	Horticulture and Animal Husbandry
6	2443/PLG/MPTB/2022	20/04/2022	Section for Infrastructure	PCCF (Wildlife) Department of Forests, Govt Of MP, Bhopal
7	2451/PLG/MPTB/2022	20/04/2022	Section for Traffic and Transportation	Divisional Commissioner, Jabalpur
8	2454/PLG/MPTB/2022	20/04/2022	Section for Tourism	Madhya Pradesh State Tourism Development Corporation
9	2463/PLG/MPTB/2022	20/04/2022	Section for Agriculture and Livelihood	Panchayat & Rural Development Department
10	2459/PLG/MPTB/2022	20/04/2022	Section for Agriculture and Livelihood	Department of Agriculture
11	Copied in letter 2459/PLG/MPTB/2022			Director Farmer Welfare and Agriculture Department

Sr No.	Letter No.	Date	Section of Draft Zonal Master Plan	Departments
12	2447/PLG/MPTB/2022	20/04/2022	Section for Conservation	Environment Department
13	Copied in letter 2447/PLG/MPTB/2022			Director (Environment), Madhya Pradesh Pollution Control Board
14	2441/PLG/MPTB/2022	20/04/2022	Section for Infrastructure and section for Traffic and Transportation	Panchayat & Rural Development Department
15	Copied in letter 2441/PLG/MPTB/2022			Chief Executive officer, Madhya Pradesh Rural Road Development Authority
16	2440/PLG/MPTB/2022	20/04/2022	Section for Infrastructure and section for Traffic and Transportation	Public Works Department
17	2439/PLG/MPTB/2022	20/04/2022	Section for Infrastructure	Urban Development and Housing
18	2455/PLG/MPTB/2022	20/04/2022	Section for Proposed Landuse Landcover	Urban Development and Housing
19	Copied in letter 2455/PLG/MPTB/2022			Commissioner, Town and Country Planning, Govt.
20	2461/PLG/MPTB/2022	20/04/2022	Section for Agriculture and Livelihood	Micro, Small and Medium Enterprises Department
21	2449/PLG/MPTB/2022	20/04/2022	Section for Conservation	Archeological Survey of India

The comments/ suggestions received from various departments are in annexure 17.1. The compliance report for the same is ad in below tables.

Madhya Pradesh Pollution Control Board, Madhya Pradesh

Table Error! No text of specified style in document.**-6 : Compliance report for comments from Madhya Pradesh Pollution Control Board of Madhya Pradesh**

Sr No	Comments	Remarks
1	The background environmental monitoring data pertaning to Air/water quality and noise level has not been mentioned in the document (1.11 p-34,1.12 p-35-36,2.9 & 2.10 p-79).The same shall be required to set ther limits while regulating the future activities likely to come up in the ESZ and the vehiculer movement in the region.	The data for Air, Water / noise is not available with MPPCB office as there are no stations to measure the same. The inwarded letter to MPPCB office is attached in Section - 2.10 of Part-1. (Page No. 45)

2	The ESZ should essentially cover the current scenerio of the Health care facilities,hotel industries,etc operating in this region so as to appropriately manage/plan of disposal of the current & future Bio-Medical waste,SWM plastics etc the same is not mentioned in the report.	The section for existing infrastructure amenities are already mentioned in section - 3.8 of Part-1. (Page No. 76 to 135) Identification of hotels and resorts are mentioned in Section - 5.5 (page No. 180)
3	The municipal solid waste and plastic waste generation and estimation has not been done in the report which is envisaged due tourism.	The estimation for generation of solid waste and liquid waste management has been incorporated in Section - 11.5 and 11.6 of Part-2 (Page No. 127 to 148) and detailed calculation is mentioned in Annexure -11.1 (Page No.126)
4	Presently, MP Pollution Control Board do not have Air/ Water/ Noise level monitoring stations at the delinated ESZ region however the monitoring of baseline data on these has to be carried out through a NABL or any Govt. approved laboratories as the Air/waiter quality and noise level of the region will be pivotal to reveal impact on the life cycless of Flora & Fauna of the region time to time.	The consultant has identified and proposed locations for Air, Water and Noise Monitoring station in Section - 11.15.6 of Part -2. (Page No.222)
5	The data pertaining to MSW,Hazadous waste, plastic waste etc has to be incorporated in the reports as the small shall be required for planing of the regulated activities such as setting up Bio- gas plants and other similar activities envisaged in the master plan.	This has been already mentioned in Section - 11.12 and 11.13 (Page No.188 to 190)

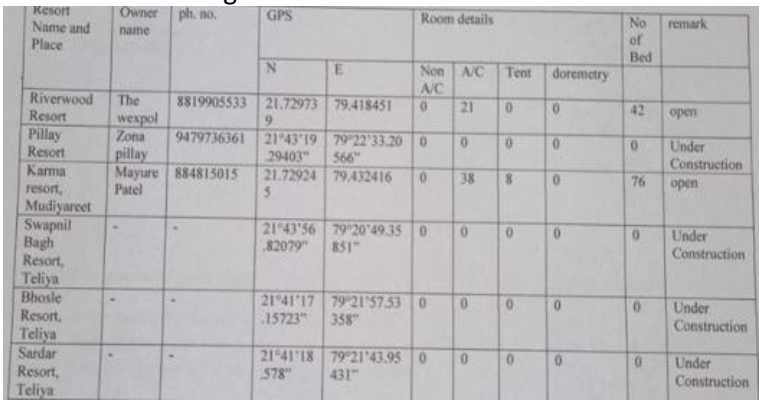
Comments from MPSTDC

Table Error! No text of specified style in document.**-7 : Compliance report for comments from MPSTDC**

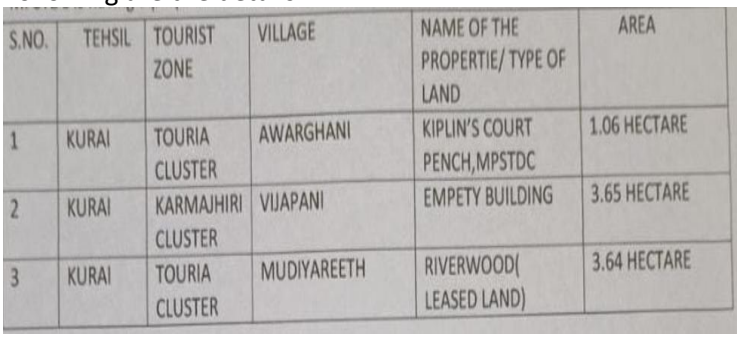
Sr No	Comments	Remarks
1	With reference to above mentioned letter would like to share following input/ comment/suggestion regarding clause 1.2.4 under Ecotourism. Under the clause 1.2.4point 2(Rukhad)& 8 (Bison Lodge):- Both the site has been outsourced to PVT Firm to operate and maintain the destination and currently it is open to serve the guests.	Noted. Incorporated in Section 5.2.4 (2 and8) of Part-1. (Page No.163)

Comments from MPSTDC

Table Error! No text of specified style in document.**-8 : Compliance report for comments from MPSTDC**

Comments	Remarks
1- Update:- The list of 57 Properties which you provide have some changes which are following. 	Noted. Incorporated in Section 5.5 of Part -1 (Page No 180)

Resort Name and Place	Owner name	ph. no.	GPS		Room details				No of Bed	remark
			N	E	Non A/C	A/C	Tent	doremetry		
Riverwood Resort	The wexpol	8819905533	21.729739	79.418451	0	21	0	0	42	open
Pillay Resort	Zona pillay	9479736361	21°43'19.29403"	79°22'33.20566"	0	0	0	0	0	Under Construction
Karma resort, Mudiyareet	Mayure Patel	884815015	21.729245	79.432416	0	38	8	0	76	open
Swapnil Bagh Resort, Teliya	-	-	21°43'56.82079"	79°20'49.35851"	0	0	0	0	0	Under Construction
Bhosle Resort, Teliya	-	-	21°41'17.15723"	79°21'57.53358"	0	0	0	0	0	Under Construction
Sardar Resort, Teliya	-	-	21°41'18.578"	79°21'43.95431"	0	0	0	0	0	Under Construction

2-Suggetion:- **A** - There is a village (Khamreeth) interior cluster which is well known for its handicrafts souvenir. In village there is a Pench craft center which is run by women's of local villages, Where tourist can choose to buy locally made souvenirs and they also try their hands on making their own cafts souvenir.Craft center also gives the livelihood of Gond tribe and also tells their stories of coexistence with the tigers.The Gonds of Penh have been true guardians of Pench National Park since eons.This craft center is an intiative by PashooPakshee and Conservation Wildlands Trust(CWT)that supports Community led tourism to led the tourist get a taste of life near protected forests.Experience a village life trail of attend a workshopor simply visit to shop for souvenirs.A brief details PPT regarding this Pench craft center and khamreeth village are enclosure with this letter.	Noted. Incorporated in Section 4.4 and 5.3.3 of Part -1 (Page No 153 and 170)
B- Touria cluster also witnessed the adventures activity of Paramotering run by a private firm in Pench Tiger Reserve.	Noted. Incorporated in Section 5.3.2 of Part -1 (Page No 170)
3-Information MPSTDC is having 3 Properties in Pench Tiger reserve . Following are the details…. 	Noted. Incorporated in Section 5.5 of Part -1 (Page No 180)

S.NO.	TEHSIL	TOURIST ZONE	VILLAGE	NAME OF THE PROPERTIE/ TYPE OF LAND	AREA
1	KURAI	TOURIA CLUSTER	AWARGHANI	KIPLIN'S COURT PENCH,MPSTDC	1.06 HECTARE
2	KURAI	KARMAJHIRI CLUSTER	VIJAPANI	EMPETY BUILDING	3.65 HECTARE
3	KURAI	TOURIA CLUSTER	MUDIYAREETH	RIVERWOOD(LEASED LAND)	3.64 HECTARE

Comments from Field Director, Pench Tiger Reserve

Table Error! No text of specified style in document.**-9 : Compliance report for comments from Field Director, Pench Tiger Reserve**

Sr No	Comments			Remarks
Part-I				
1	टाइटल पेज	सतपुड़ा राष्ट्रीय उद्यान का विवरण है	यहाँ पर टाइटल में इंदिरा प्रियदर्शिनी पेंच राष्ट्रीय उद्यान	Noted. Incorporated.

			एवं पेंच मोगली अभ्यारण्य लिखा होना था।	
2	पेज नं. 9 पॉइन्ट नं. 1.8	पहले पैराग्राफ में टेण्डर प्रोसेस के बारे में लिखा है, उक्त जानकारी जो कि संबंधित नहीं है।	विलोपित करे।	Noted. Incorporated in Section 1.8. (Page No. 09)
	पेज नं. 26 एवं पॉइन्ट 2 एवं 2.1	सतपुड़ा राष्ट्रीय उद्यान का विवरण है।	यहाँ पर टाइटल में इंदिरा प्रियदर्शिनी पेंच राष्ट्रीय उद्यान एवं पेंच मोगली अभ्यारण्य के विवरण का उल्लेख करे।	Noted. Incorporated in Section 2.1. (Page No. 26)
3	पेज नं 27 पॉइन्ट नं 2.2	सतपुड़ा राष्ट्रीय उद्यान का विवरण है।	यहाँ पर टाइटल में इंदिरा प्रियदर्शिनी पेंच राष्ट्रीय उद्यान एवं पेंच मोगली अभ्यारण्य के विवरण का उल्लेख करे।	Noted. Incorporated in Section 2.2. (Page No. 27)
4	पेज नं 29 पॉइन्ट नं 2.4	सतपुड़ा राष्ट्रीय उद्यान का विवरण है।	यहाँ पर टाइटल में इंदिरा प्रियदर्शिनी पेंच राष्ट्रीय उद्यान एवं पेंच मोगली अभ्यारण्य के विवरण का उल्लेख करे।	Noted. Incorporated in Section 2.4. (Page No. 29)
5	पेज नं 31 पॉइन्ट नं 2.5	सतपुड़ा राष्ट्रीय उद्यान का विवरण है।	यहाँ पर टाइटल में इंदिरा प्रियदर्शिनी पेंच राष्ट्रीय उद्यान एवं पेंच मोगली अभ्यारण्य के विवरण का उल्लेख करे।	Noted. Incorporated in Section 2.5. (Page No. 31)
6	पेज नं. 35	मैप स्पष्ट नहीं है।	मैप को अलग से एक फूल पेज में लगाये।	An A3 size map is provided in Annexure 18
7	पेज नं. 47 एवं पॉइन्ट 3	सतपुड़ा राष्ट्रीय उद्यान का विवरण है।	यहाँ पर टाइटल में इंदिरा प्रियदर्शिनी पेंच राष्ट्रीय उद्यान एवं पेंच मोगली अभ्यारण्य के विवरण का उल्लेख करे।	Noted. Incorporated in Section 3. (Page No. 48)
8	पेज नं. 58	मैप स्पष्ट नहीं है।	मैप को अलग से एक फूल पेज में लगाये।	An A3 size map is provided in Annexure 18
9	पेज नं. 146	मैप स्पष्ट नहीं है।	वर्षवार मैप को अलग अलग पेज पर लगाये।	An A3 size map is provided in Annexure 18
10	पेज नं. 158	मैप स्पष्ट नहीं है।	इस मैप को पेज नं. 148 मैप के समान बनाये।	An A3 size map is provided in Annexure 18
11	पेज नं. 175	मैप स्पष्ट नहीं है।	इस मैप को पेज नं. 174 मैप के समान बनाये।	An A3 size map is provided in Annexure 18

12	पेज नं. 180	मैप स्पष्ट नहीं है।	इस मैप को स्पष्ट बनाये।	An A3 size map is provided in Annexure 18
13	पेज नं. 180 से 190	5.6 की लिस्ट मैप एवं विवरण में समानता नहीं है। लिस्ट में 22 साईट का नाम हे 5 - 43 मैप में 10 जगह दिखाया गया है एवं विवरण सिर्फ 19 का दिया गया है।	आंकड़ों में समानता एवं विवरण स्पष्ट करे।	All sites are mentioned in indicative map for visual purpose only.
14	पेज नं. 197	मैप स्पष्ट नहीं है।	इस मैप को पेज नं. 174 मैप के समान बनाये।	An A3 size map is provided in Annexure 18
15	पेज नं. 217	मैप स्पष्ट नहीं है।	इस मैप को पेज नं. 174 मैप के समान बनाये।	An A3 size map is provided in Annexure 18
16	पेज नं. 231 एवं पॉइन्ट 7.9.2	सतपुड़ा राष्ट्रीय उद्यान का विवरण है।	यहाँ पर टाइटल में इंदिरा **प्रियदर्शिनी पेंच राष्ट्रीय उद्यान एवं** पेंच मोगली अभ्यारण्य के विवरण का उल्लेख करे।	Noted. Incorporated in Section 7.5 (Page No. 231) and Section 7.9.2 (Page No. 239)
Part -II				
17	पेज नं. 74	मैप स्पष्ट नहीं है।	इस मैप को पेज नं. 12 मैप के समान बनाये।	Noted.
18	पेज नं. 75	मैप स्पष्ट नहीं है।	इस मैप को पेज नं. 12 मैप के समान बनाये।	An A3 size map is provided in Annexure 18
19	पेज नं. 115	मैप स्पष्ट नहीं है।	इस मैप को पेज नं. 12 मैप के समान बनाये।	An A3 size map is provided in Annexure 18
20	पेज नं. 177,178,184,190,204,222	मैप स्पष्ट नहीं है।	इस मैप को पेज नं. 84 मैप के समान बनाये।	An A3 size map is provided in Annexure 18

Comments from PCCF, Madhya Pradesh

Table Error! No text of specified style in document.**-10 : Compliance report for comments from PCCF**

No.	Comments	Remarks

1	An order is passed by Hon'ble Supreme Court, Court order, Court No. 5, Items No. 1501, section PIL-W, Writ Petition(s) (civil) No.(s) 202/1995 on 03/06/2022 regarding Eco Sensitive Zones of National Parks/Wildlife Sanctuaries of MP. Comments regarding the same has been received from PCCF(WL). Any kind of permanent construction in the Eco-Sensitive Zone area of any National Park/Wildlife Sanctuary is restricted. Therefore it is instructed to amend all the Zonal Master plan of Eco Sensitive Zone of National Parks/wildlife sanctuaries falling under Cluster -4 and prepare Zonal master plan of Cluster -5 according to the Hon'ble Supreme court Order.	Noted. Incorporated in Section 10.4.1 (Page-44) and Section 10.4.3 (Page-47). Copy of an order of Hon. Supreme Court (date 03/06/2022 and subsequent amendment vide Order no. 10 SCC 544 on 26th April 2023 & 28th April 2023) is also added into annexure. (Page 229 and 260 & 313)

Comments from Town and Country Planning, Madhya Pradesh

Table Error! No text of specified style in document.**-11: Compliance report for comments from Joint Director, TCPO-Madhya Pradesh**

Sl.No.	Comments	Remarks
1	It was suggested by joint director to confirm on the data source for decadal Change.	The source for the decadal change is procured from *The Oak Ridge National Laboratory Distributed Active Archive Center (ORNL DAAC) from NASA'S Earth Science Mission* as mentioned in Chapter-4, section -4.1.1, page no-147 in Part-1 Report
2	The joint director mentioned to identify the stream order in study area.	The buffer for streams is mentioned at Chapter-11, Table-11-22, Page No- 157, Part- 2 report.
3	It was suggested to procure the satellite data from State IT in order to show the Landuse/Land cover change in Pench Tiger Reserve. It is suggested that Mr. Venugopal will provide the satellite image.	The accuracy of the data has been achieved from GIS file shared by the State IT- Madhya Pradesh
4	The joint director has advised to mark the man-animal conflict in the map	The Human -Conflict points are mentioned at Chapter -2, section 2.8.5, page No- 44, Part-1 Report
5	It was recommended to verify provisions of wildlife corridors at SH and NH crossing within the ESZ	Noted. The same has been complied in Chapter-11, section -11.10.7, page no-186, Part-2 Report
6	It was informed to ensure inclusion of phasing strategy as part of the implementation framework	Noted. The same has been complied in Chapter-16, Page no-336, Part-2 Report

Sl.No.	Comments	Remarks
7	It was suggested to confirm on the methods adopted for population projection.	Complied. Refer Chapter-3, section-3.4, page no - 61, Part -1 Report