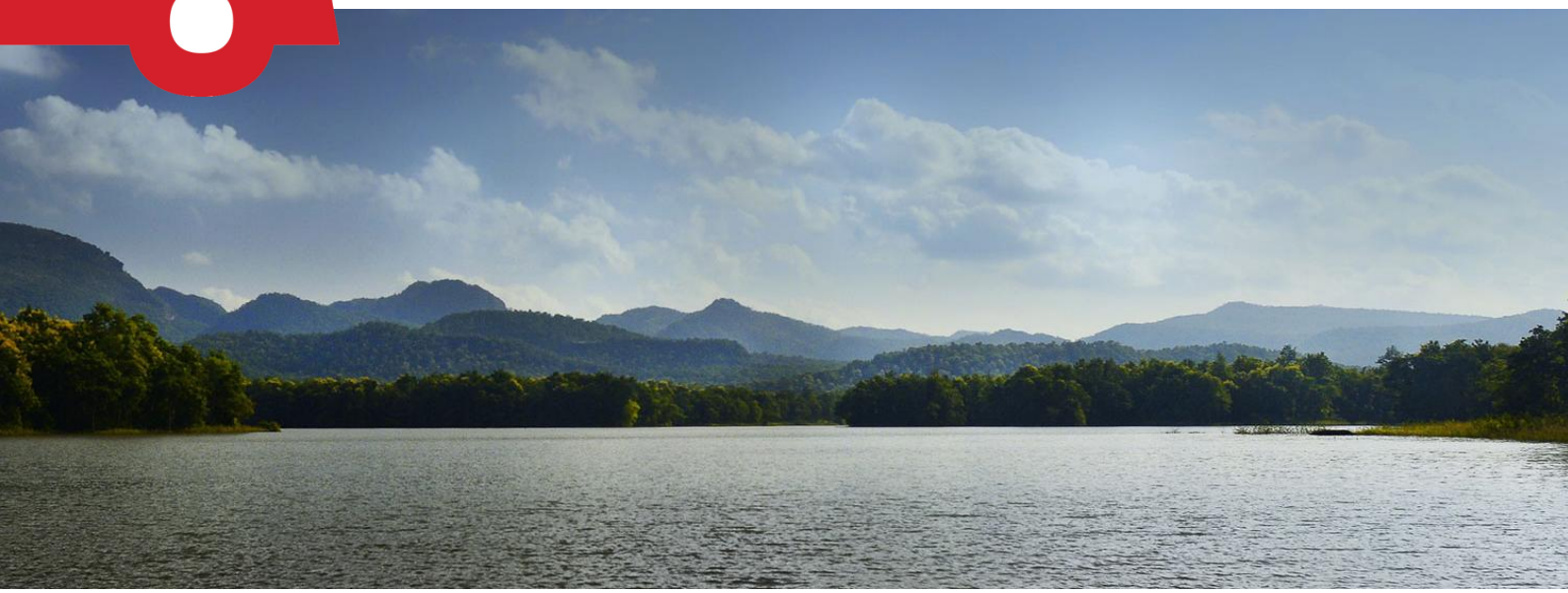
PREPARATION OF ZONAL MASTER PLANS FOR ECO SENSITIVE ZONES: SATPURA NATIONAL PARK AND PACHMARHI & BORI WILDLIFE SANCTUARY




VOLUME 2 - ANNEXURES



Madhya Pradesh Tourism Board, Bhopal

SYSTRA SAL GROUP

PREPARATION OF ZONAL MASTER PLANS FOR ECO SENSITIVE ZONES: SATPURA NATIONAL PARK AND PACHMARHI & BORI WILDLIFE SANCTUARY

IDENTIFICATION TABLE	
Client/Project owner	Madhya Pradesh Tourism Board, Bhopal
Project	PREPARATION OF ZONAL MASTER PLANS FOR ECO SENSITIVE ZONES: SATPURA NATIONAL PARK AND PACHMARHI & BORI WILDLIFE SANCTUARY
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ANNEXURE 1.1 : LIST OF NOTIFIED VILLAGES

S.No	Name of Villages	District	Longitude	Latitude
1	Maharajgang	Hoshangabad	78.46429	22.71103
2	Nayagaon	Hoshangabad	78.43874	22.71579
3	Ghogri matha	Hoshangabad	78.4425	22.70425
4	Amadeh	Hoshangabad	78.43636	22.67732
5	Raitwadi	Hoshangabad	78.42187	22.68221
6	Madho	Hoshangabad	78.40464	22.67686
7	Bori	Hoshangabad	78.40213	22.68853
8	Dokrikheda	Hoshangabad	78.37633	22.65786
9	Choka	Hoshangabad	78.37167	22.64446
10	Aanhoani	Hoshangabad	78.35181	22.63494
11	Muharikhurd	Hoshangabad	78.33859	22.64513
12	Muharikala	Hoshangabad	78.30226	22.66343
13	Sanghii	Hoshangabad	78.28484	22.66993
14	Sehra	Hoshangabad	78.16963	22.5831
15	Kamti	Hoshangabad	78.15882	22.60744
16	Tekapar	Hoshangabad	78.15037	22.58358
17	Sarangpur	Hoshangabad	78.14555	22.57775
18	Ghogri	Hoshangabad	78.12046	22.58567
19	Mangaria	Hoshangabad	78.10279	22.59454
20	Urdaon	Hoshangabad	78.09624	22.57956
21	Kharpawad	Hoshangabad	78.07262	22.57528
22	Pathai	Hoshangabad	78.03309	22.60285
23	Tawanagar	Hoshangabad	77.97639	22.56691
24	Ranipur	Hoshangabad	77.95484	22.56772
25	Chicha	Hoshangabad	77.91397	22.54456
26	Daudi	Hoshangabad	77.89123	22.52201
27	Chatua	Hoshangabad	77.90593	22.46937
28	Jhunkar	Hoshangabad	77.90672	22.42959
29	Kotmi	Hoshangabad	77.90457	22.40127
30	Maruapura	Hoshangabad	77.89348	22.37951
31	Chichadhana	Hoshangabad	77.89974	22.37151
32	Ladema	Hoshangabad	77.8942	22.37073
33	Bardha	Hoshangabad	77.91484	22.33553
34	Dhasaii	Betul	77.9483	22.32502
35	Kelipunji	Betul	77.99334	22.30717
36	Bhatodi	Betul	78.19238	22.38626
37	Baruth	Chhindwara	78.29046	22.40346

S.No	Name of Villages	District	Longitude	Latitude
38	Dundalum	Chhindwara	78.28078	22.38458
39	Chhatiaam	Chhindwara	78.31345	22.3877
40	Kurrai	Chhindwara	78.34644	22.41302
41	Alimod	Chhindwara	78.37416	22.39472
42	Bijori	Chhindwara	78.4486	22.37362
43	Sangakheda	Chhindwara	78.45733	22.36393
44	Kundaidhana	Chhindwara	78.47338	22.36198
45	Nishan	Chhindwara	78.53165	22.40401
46	Umardole	Chhindwara	78.54858	22.3972
47	Belkhedi	Chhindwara	78.56243	22.41129
48	Lukkhadhana	Chhindwara	78.57616	22.41081
49	Anjandhana	Chhindwara	78.57781	22.42217
50	Bandhan	Chhindwara	78.5465	22.51054
51	Dundi	Chhindwara	78.5416	22.50832
52	Aaditoria	Chhindwara	78.51853	22.57712
53	Jhirpa	Chhindwara	78.51465	22.59659
54	Khanchari	Chhindwara	78.50298	22.59473
55	Navatola	Chhindwara	78.50639	22.59775
56	Karer	Chhindwara	78.50785	22.60683
57	Matkuli	Hoshangabad	78.45486	22.59284
58	Chhirrai	Hoshangabad	78.47814	22.59286
59	Chillod	Hoshangabad	78.45909	22.60774
60	Khari	Hoshangabad	78.44981	22.61203
61	Mohagaun	Hoshangabad	78.4489	22.60754
62	Malli	Hoshangabad	78.43623	22.59764
63	Pisua	Hoshangabad	78.40352	22.59627
64	Bindakheda	Hoshangabad	78.41941	22.58834
65	Mehandikheda	Hoshangabad	78.43892	22.58256
66	Pachmarhi	Hoshangabad	78.42086	22.45545
67	Fiferi	Hoshangabad	78.53644	22.51033
68	Manakachar	Hoshangabad	78.5295	22.55292
69	Devi	Hoshangabad	78.40429	22.66339

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	115.95	15.35%
Built up	6.25	0.83%
Forest	573.03	75.84%
Waste Land	18.34	2.43%
Waterbodies	42.03	5.56%
Total Area	**755.60**	**100.00%**

Source: State IT department- Bhopal

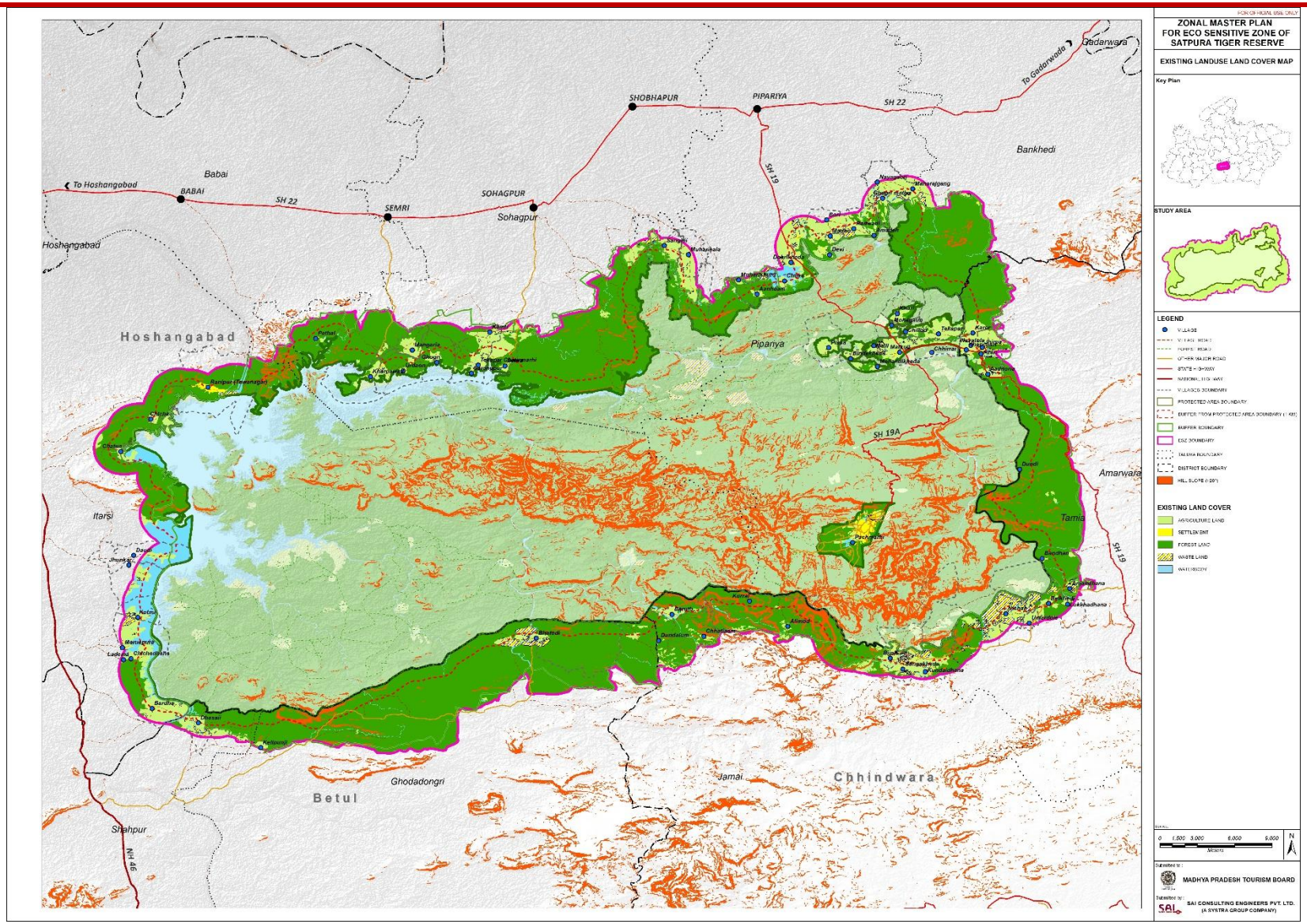


Figure 2- 1:Existing land Use/Land Cover for STR

1.2.2.2 Areas for Sustainable Development

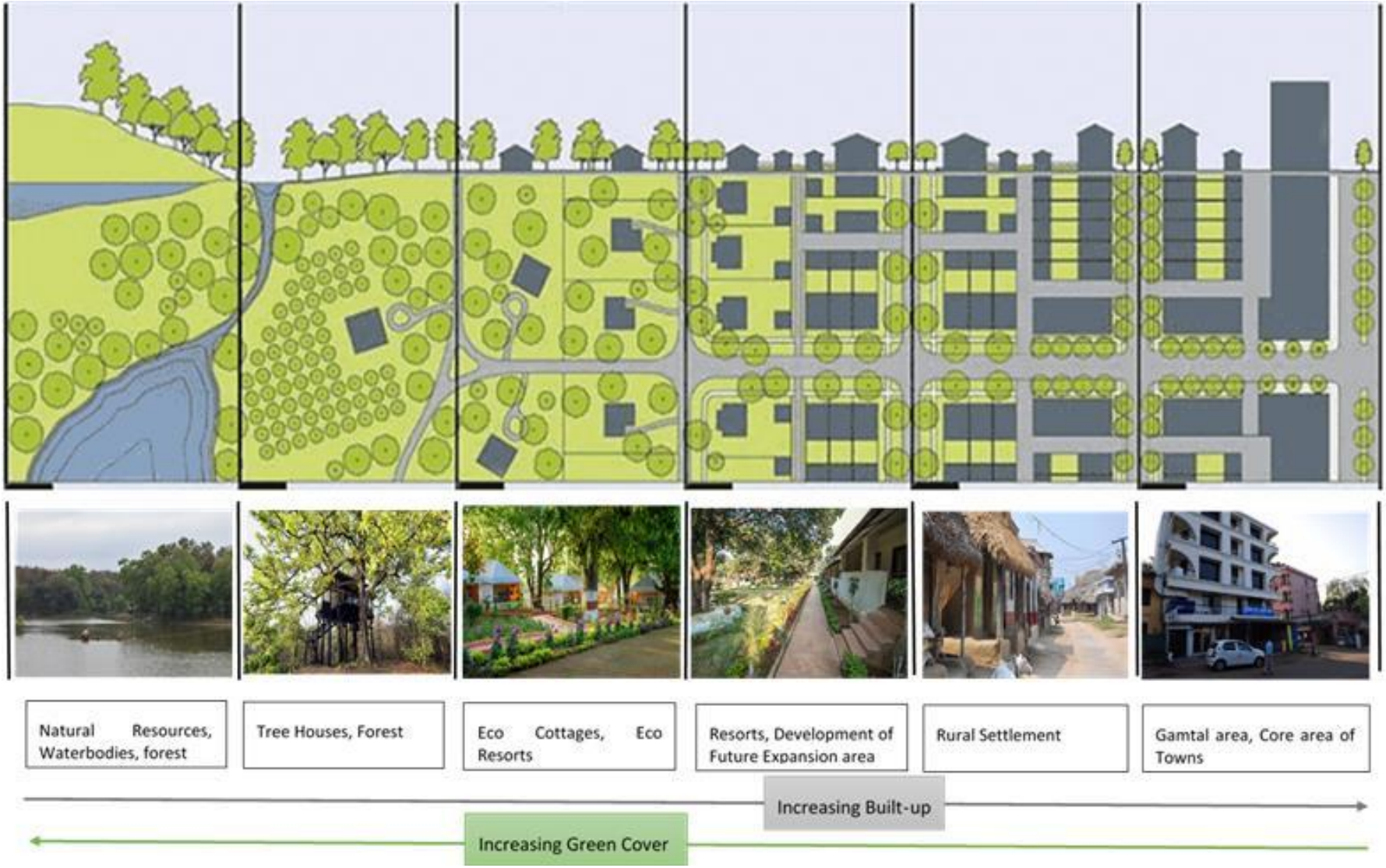


Figure 2- 2 Concept of proposed development in Eco Sensitive zone of Satpura Tiger Reserve

1.2.2.3 Suggestive Guidelines for Development

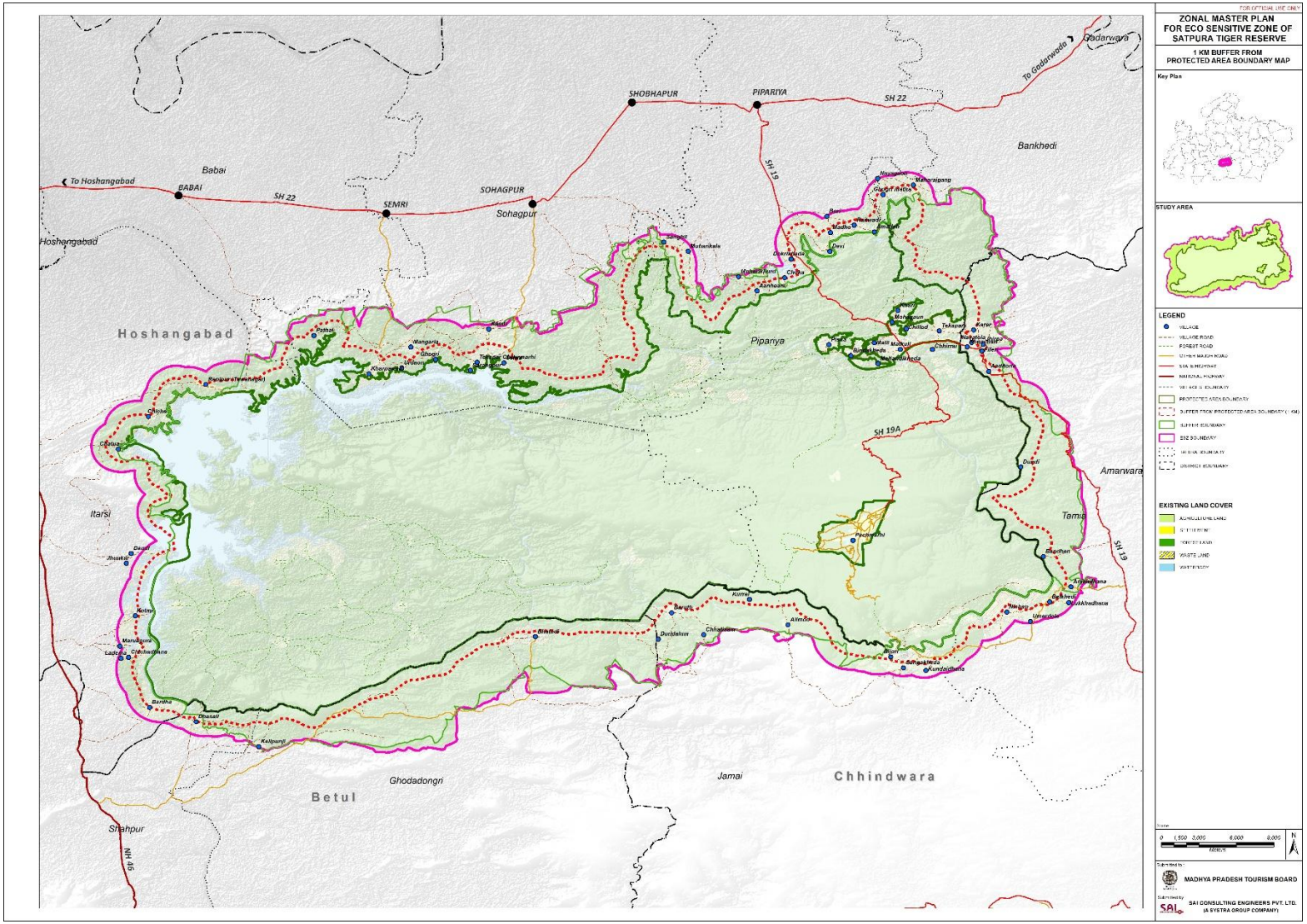


Figure 2- 3: 1 km from Protected area Boundary Map

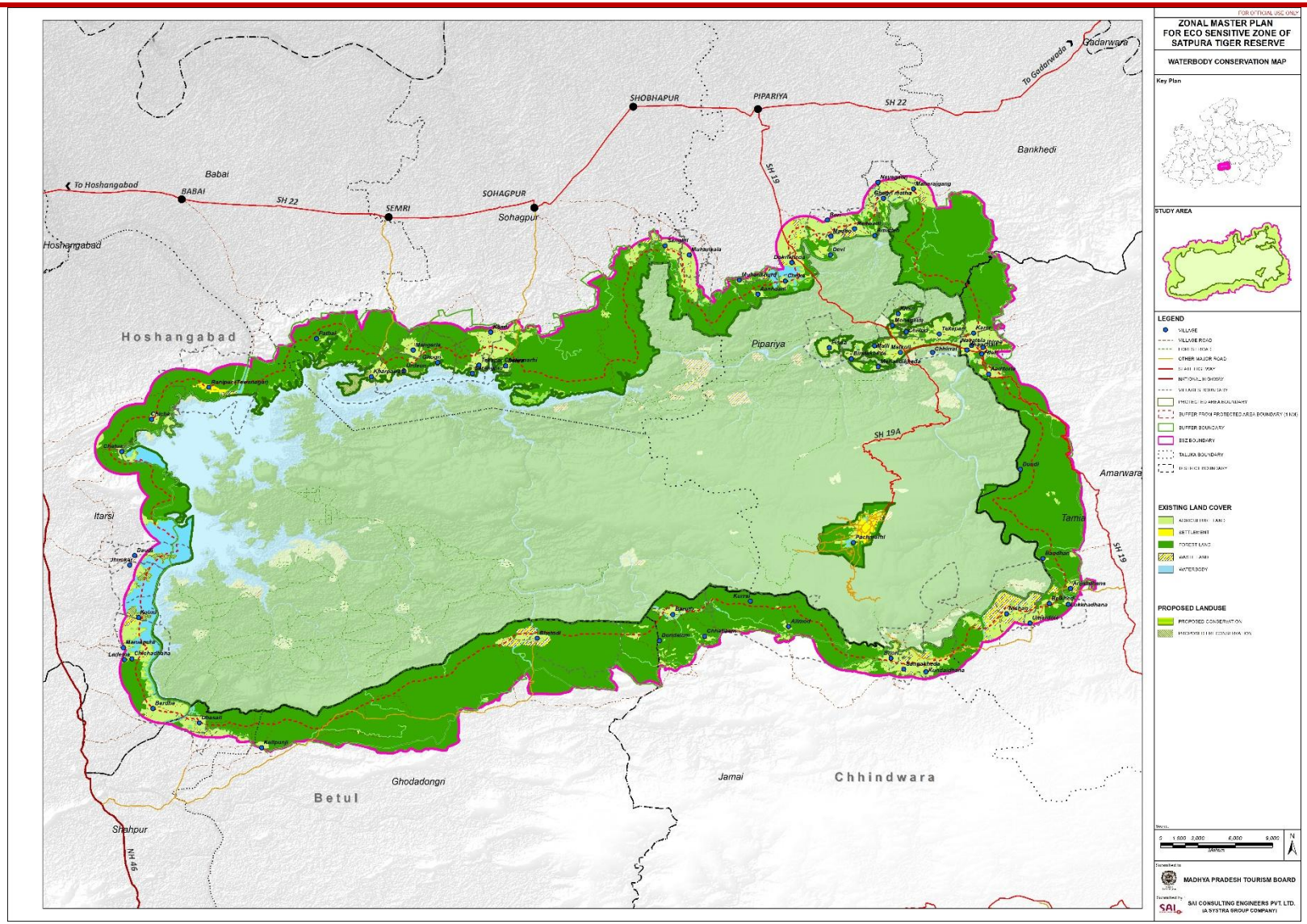


Figure 2- 4:Waterbody Conservation Map

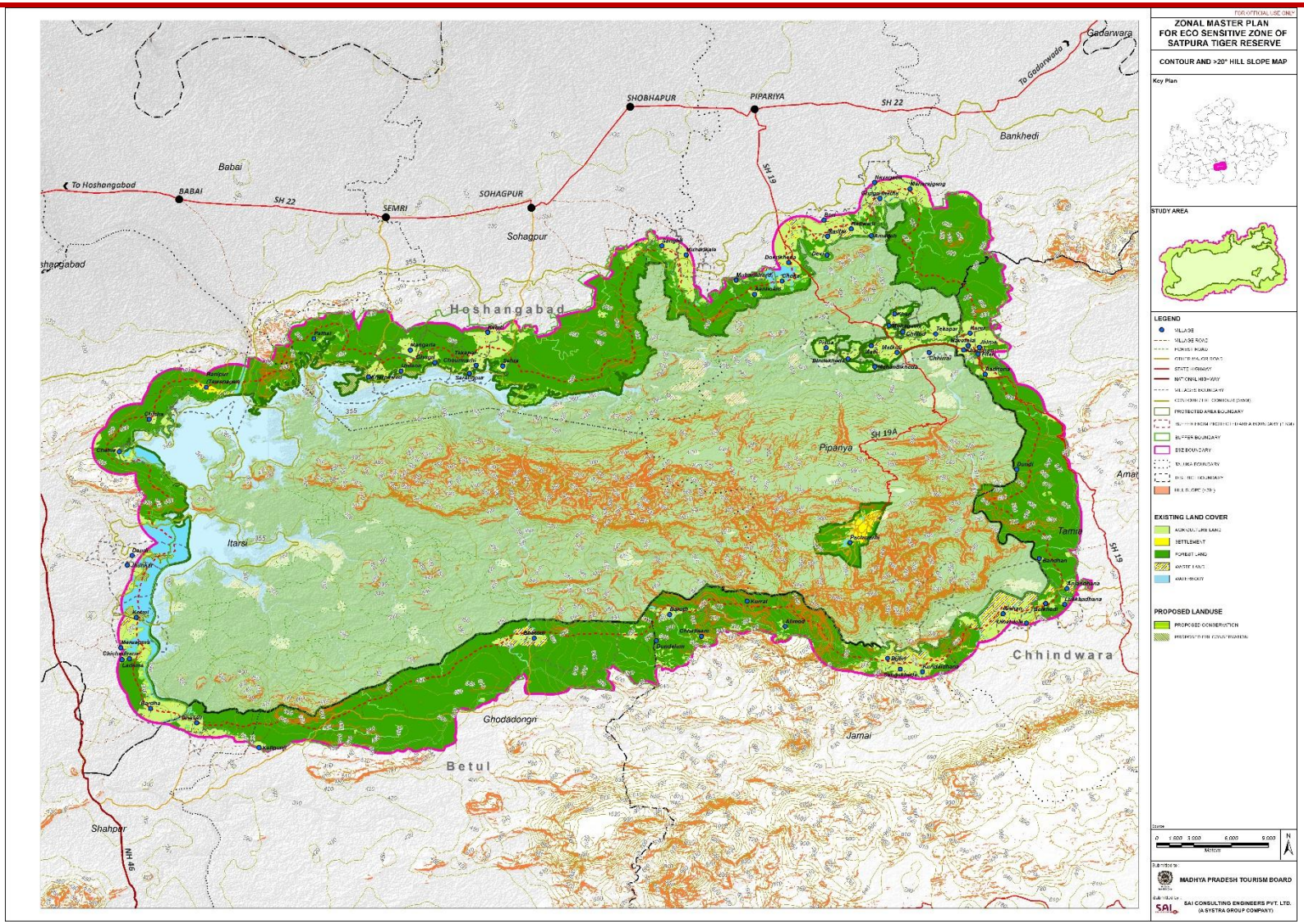


Figure 2- 5: Slope more than 20° in STR

Source: NRSC-Bhuvan

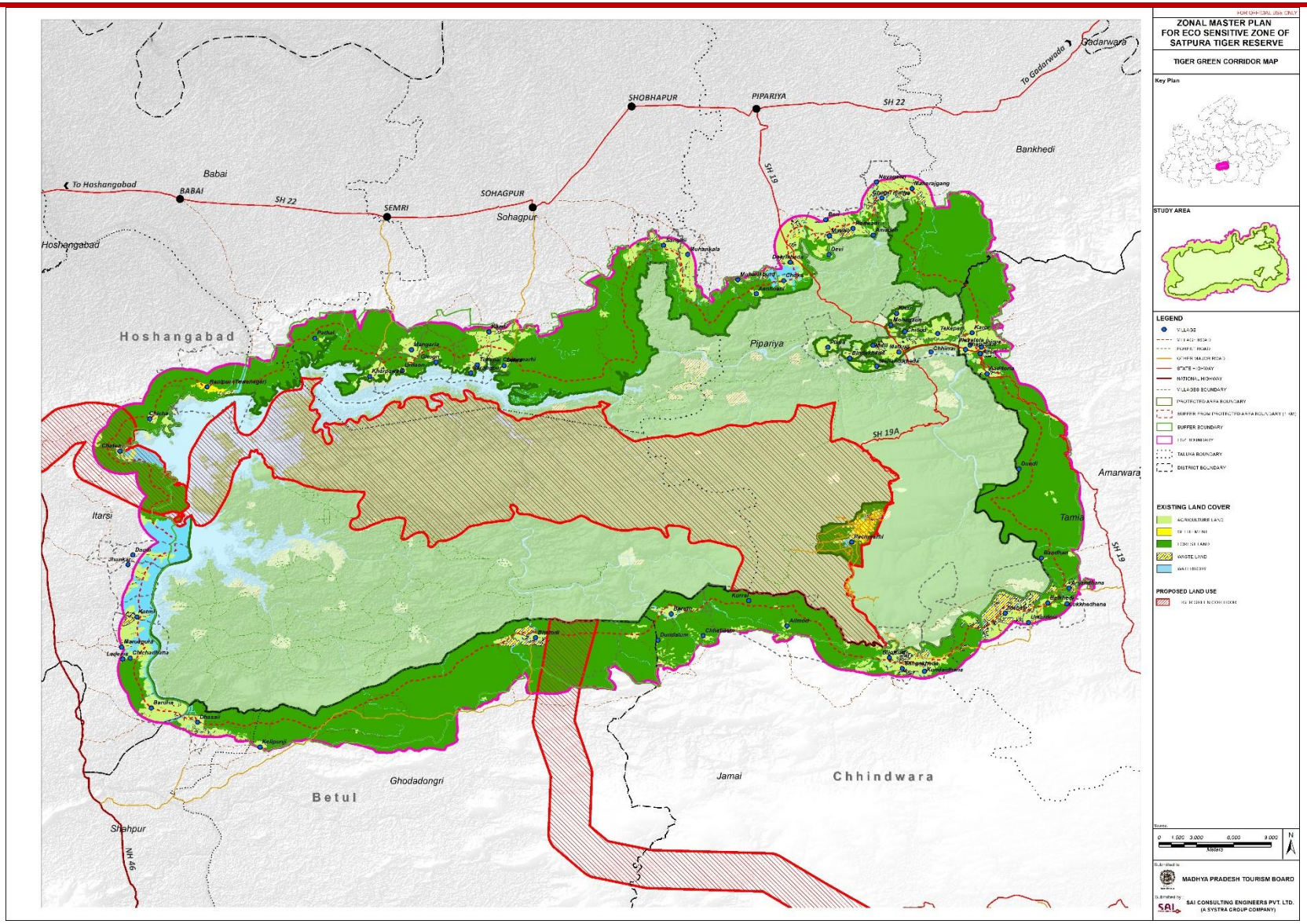


Figure 2- 6: Green corridor (Tiger) of STR

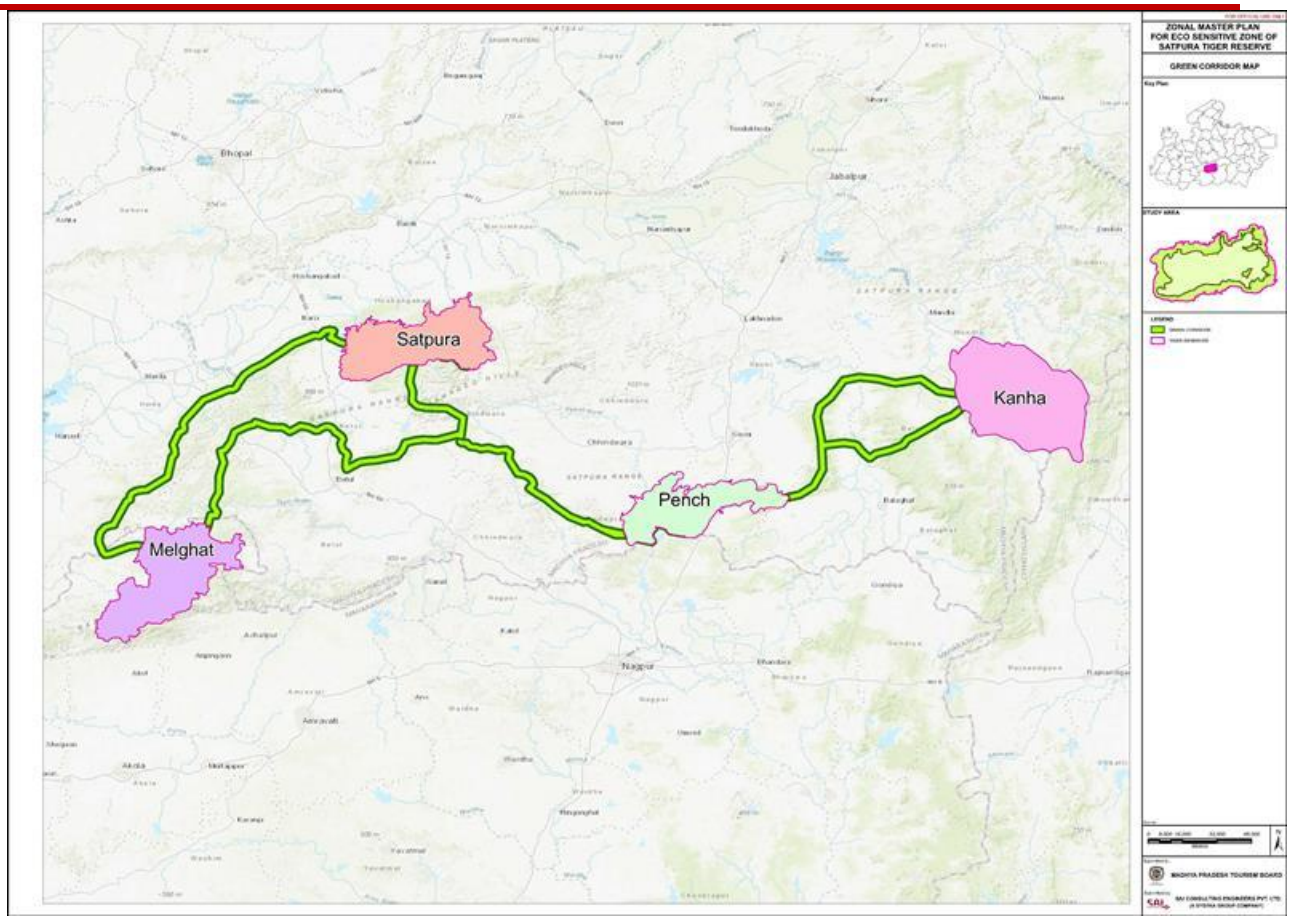


Figure 2- 7: Green corridors of STR

1.2.2.3.1 Status of Pachmarhi Sanctuary

Table 2- 2: Villages to be excluded from Pachmarhi Sanctuary

S.No	Name of the Village	Type of Village	Tehsil	Area in Hectare
1	Chirrai	Revenue Village	Pipariya	230.436
2	Mehandikera	Revenue Village	Pipariya	102.561
3	Bindakera (Dhabri)	Revenue Village	Pipariya	129.66
4	Maili	Revenue Village	Pipariya	66.83
5	Chillod	Revenue Village	Pipariya	127.716
6	Matkuli	Revenue Village	Pipariya	458.837
7	Mohgaon	Revenue Village	Pipariya	144.19
8	Chandan Pipariya	Revenue Village	Pipariya	97.021
9	Pisua	Revenue Village	Pipariya	308.507
10	Khari	Revenue Village	Pipariya	235.424
11	Tekapar	Revenue Village	Pipariya	460.348
Total				2361.530

Table 2- 3:Dos and Don'ts for the Development Hotels and Resorts

Sl.No	Do's	Don'ts
1	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. **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.	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**.
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.	***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.

	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.	
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 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.	***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**.
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	***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**

	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)**)	**(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 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.	***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 **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.	

Conservation areas for Water Bodies (Buffer)

As received from the Irrigation Department, the Tawa Reservoir has a Full Reservoir Level (FRL) of 1166 feet, while the Denwa River has a High Flood Level (HFL) of 78 feet. Based on the levels and guidelines, the conservation area for water bodies covers an area of 2519.26 hectares. The methodology used for marking the High Flood Level (HFL) using contours in GIS involves the following general steps. These levels are typically identified using topographic data, hydrological models, or flood mapping. The steps are

- Obtain Elevation Data
  - Download / Procure elevation data form of Digital Elevation Models (DEM) using USGS portal download the SRTM DEM data.
- Prepare the DEM Data in GIS
  - Using USGS ASTER DEM data derived various interval contour using GIS Software.
- Identify the HFL Criteria (Received from WRD/Irrigations)
  - This values table we received from WRD/Irrigation Department.
  - HFL values are usually determined by hydrological studies or flood hazard assessments. These values represent specific elevations above mean sea level (MSL) during a flood event.
- Using Contour Lines elevation level Mark, the HFL based on the FRL.
  - Using GIS Advanced spatial tools process the process the data and mark the HFL areas based on the FRL through/using Contour elevation.
- Export or Present the Results
  - Once the HFL areas are identified and marked, export the map or the GIS layers for further analysis, reporting, or presentation.

Steps Marking High Flood Level (HFL) using GIS

1. Obtain Elevation Data
   - Download Digital Elevation Models (DEM) from sources like USGS (SRTM/ASTER DEM).
2. Prepare DEM Data in GIS
   - Use GIS software (e.g., ArcGIS) to process DEM.
   - Generate contour lines at appropriate elevation intervals.
3. Identify HFL Criteria
   - Collect HFL values from the Water Resources/Irrigation Department.
   - HFL values represent maximum floodwater levels based on historical and hydrological studies.
4. Overlay HFL on Contour Lines
   - Use Spatial Analyst tools to mark HFL based on elevation.
   - Interpolate contours and extract HFL areas.
5. GIS Tools Used in the Process - ArcGIS Spatial Analyst Tools:
   - Contour Tool – Extract elevation-based contour lines.
   - Reclassify Raster – Generate flood zones based on HFL

1.2.2.4 Areas for Eco-Restoration

1.2.2.4.1 Regeneration of forest

The regeneration of forest is important in STR as damage to forest cover may happen because of human activities like construction or widening of roads, buildings, collection of timber and woods, NTFP and natural disasters like floods because of heavy rain, drought and many more. Forest cover is largely affected by human disturbance, to regenerate those damaged forest cover, social forestry and agro forestry is proposed in the region of Eco-Sensitive zone. This social forestry can be practiced increasing forest cover on Government land and wastelands. Apart from that, on degraded forest cover land it should be practiced densifying forest cover.

Social forestry refers to the management of forests for the benefits of local communities. It includes aspects such as forest management, forest protection, and afforestation of deforested lands with the

objective of improving the rural, environmental, and social development. The main goal of social forestry is to grow trees and plantations to meet the growing needs of people in reference to increased demand for timber, wood, food, fuel, and food to reduce the pressure and dependency on traditional forest areas. The practice also aims to protect agriculture from adverse climatic conditions by improving the environment, increase the natural beauty, and increasing the supply of forest produce for local use. A dense social forestry helps to develop the habitat for wildlife, soil conservation, additional resources to communities, improving air qualities, decreasing temperature in surrounding areas and noise barriers to the area. Honeybee farming can be promoted as economic activities as well helps in regeneration of forest. Honeybee farming can be developed with Agro forestry or social forestry by communities of villages.

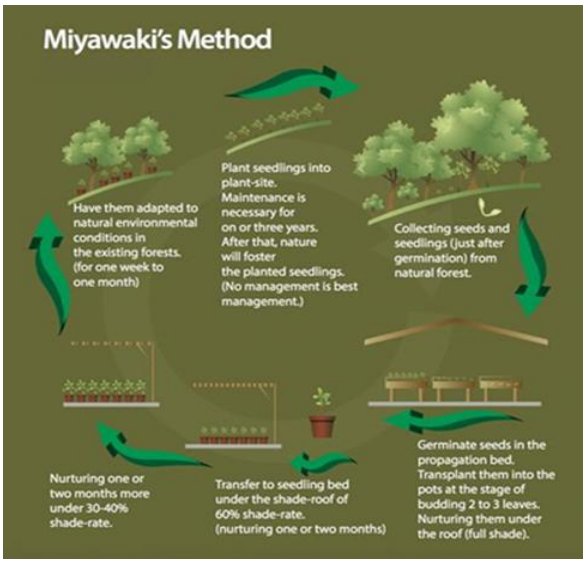


Figure 2- 8: Miyawaki Forest Methodology

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 many 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.

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.

1.2.2.4.2 Agro forestry

It involves the growth of trees and agriculture in the same setting to provide landowners with agricultural and tree products on a commercial basis and for a specific purpose within a farming context. The common purpose is usually timber plantations on private land, but the setup can be applied to a range of enterprises that are managed in a variety of ways using different parts of the trees. Farm forestry offers

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

many benefits that include shelter and pasture for animals, additional diversified earnings, improved living environments, an increase in the capital value of the plantation, improvement, and maintenance of soil and water health, sustainable management of natural resources, and increases in biodiversity. Agro forestry offers businesses economic benefits, social benefits, and increased productivity as well as the provision of ecological goods and services.

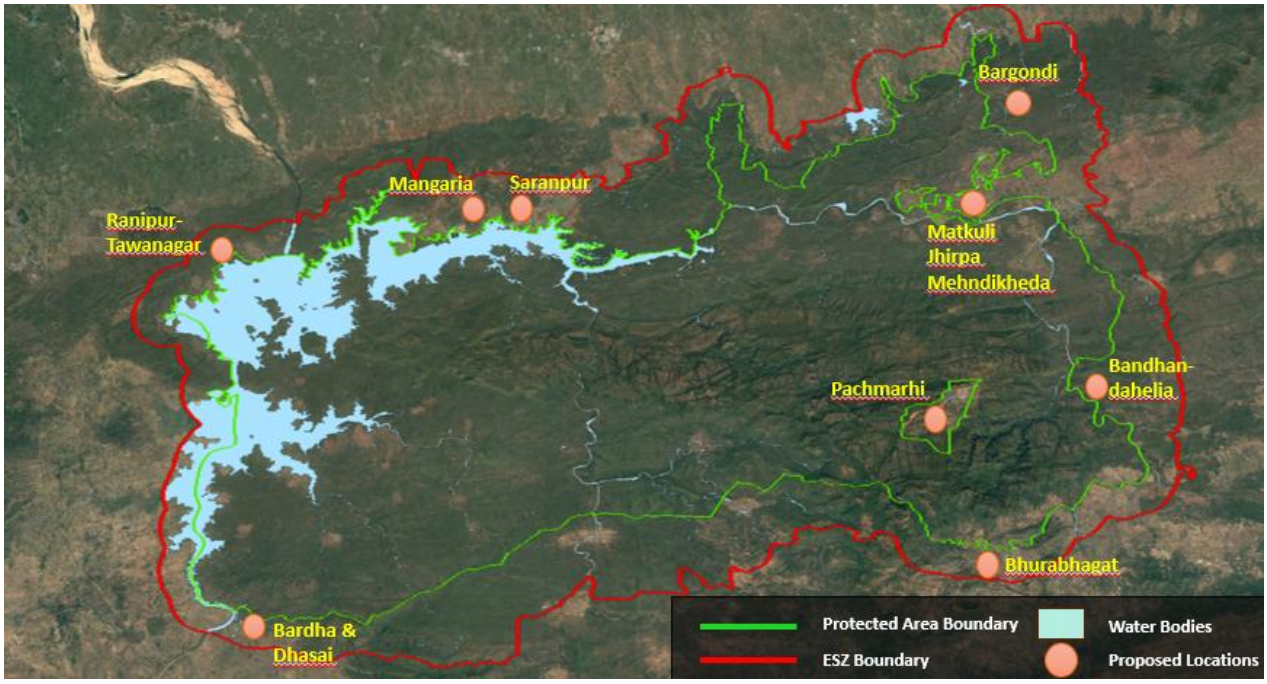


Figure 2- 9: Proposed Socio-Forestry locations

Socio forestry is allowable in any region of ESZ. But by having proposals for tourism and accommodation at selected location, that will increase the human disturbance and decrease of forest cover. By considering that aspect, suggestive proposal locations for social forestry at Bardha, Dhasai, Bhurabhagat, Sangakheda, Mehendikheda, Jhirpa, Matkuli, Bargondi, Sarangpur,Mangaria and Ranipur Tawanagar.

1.2.2.4.3 Bio-diversity Park

Located on central plateau of India, Satpura Tiger Reserve is the bio-hotspot for flora and fauna. Many Himalayan and Southern species of flora and fauna can be observed in Satpura range. This biodiversity should be conserved with its natural habitat. With the purpose of conserving the ecosystem of the region, promoting nature-based eco-tourism, and spreading awareness, suggestive locations for ecological parks have been proposed in the areas of Bandhan-Dahelia, Bargondi, Madhai, and Pachmarhi. 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.

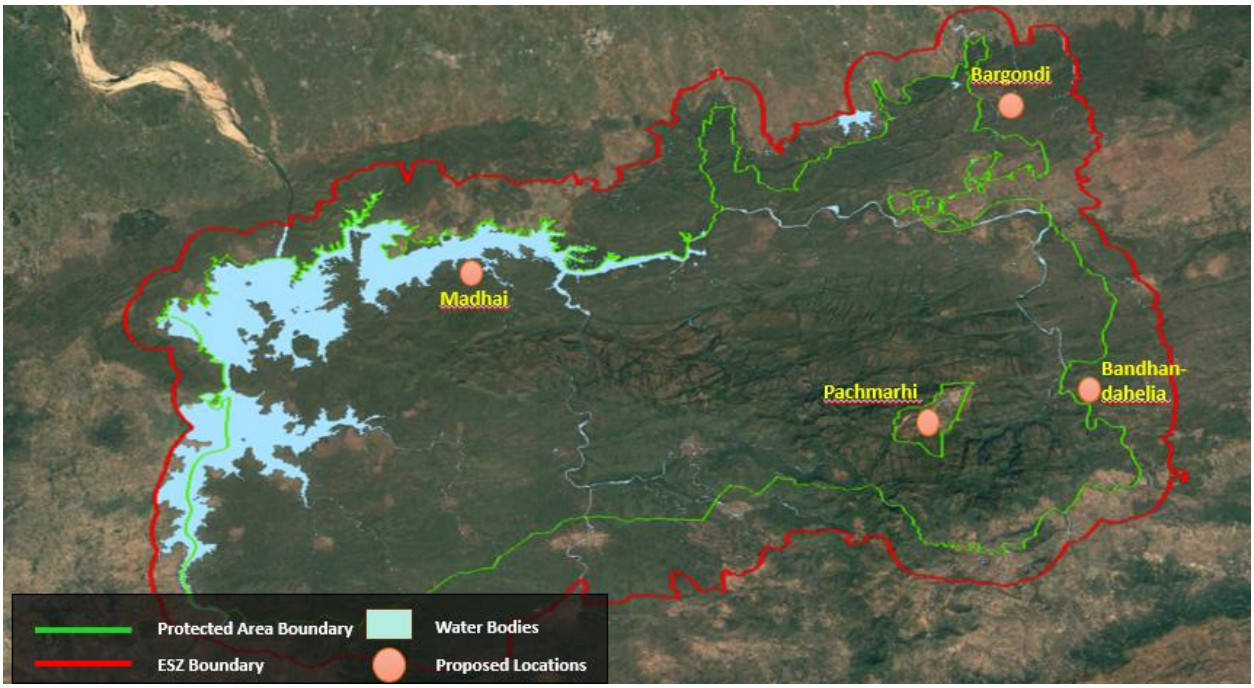


Figure 2- 10 : Proposed potential Bio-diversity park suggestive locations

Biological parks provide the native environment for flora and fauna for conservation as well as growth with less disturbance. It also helps to maintain the bio-diversity presence in the area with human interactions. In STR, Bandhan and Dahelia, Bargondi, Parsapani, Pachmarhi and Bhatodi are places which have potential for biodiversity parks with unique characteristics to the places. Bandhan and Dahelia have the unique landscape and native atmosphere for the flora and fauna to flourish. It also has very less disturbance as it is near to protected area. While Pachmarhi and Madhai have the large number of tourists visits, these parks like butterfly park, flower trails and many more options can be a large attraction in the area. The Bhatodi is the ideal place for conservation of species in natural and native environment as it is also a part of green corridor. A research and observatory for the species can be developed in the area.

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.

The botanical park suggestive locations in Pachmarhi, Sarangpur, Sangakheda and Alimod. The park may consist of identification of oldest species, unique species or different type of faunal diversities and other suitable attractions with a research center in park The park management can be handled by various institutions like Satpura Tiger Reserve authority, MP state biodiversity Board and Madhya Pradesh Tourism Board.

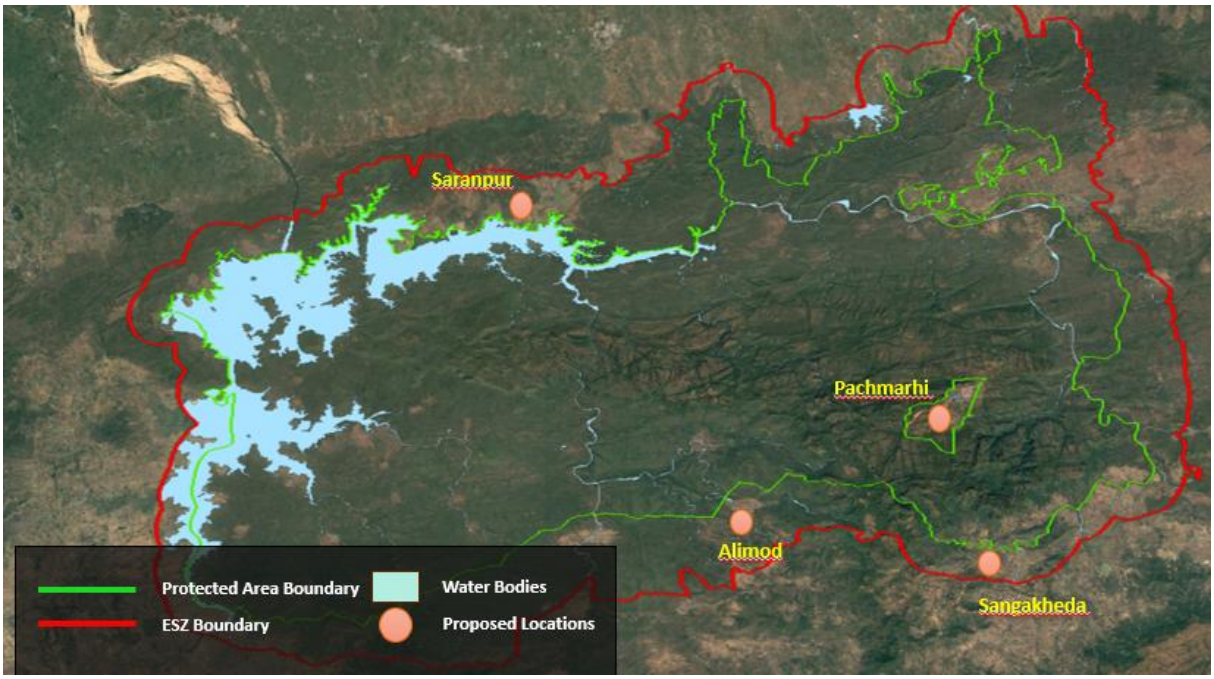


Figure 2- 11: Suggestive Proposed Botanical Park & Herb Park locations

1.2.2.4.5 Butterfly Park & Flower trails

A butterfly embodies all that is special about nature like free, beautiful, enchanting, and mysterious. To some people a butterfly occupies an exalted status, an incredibly special place in their hearts, and they will travel halfway around the world, spending a few thousand dollars for the joy of spotting a particular butterfly. The case study for the model butterfly park is as below:

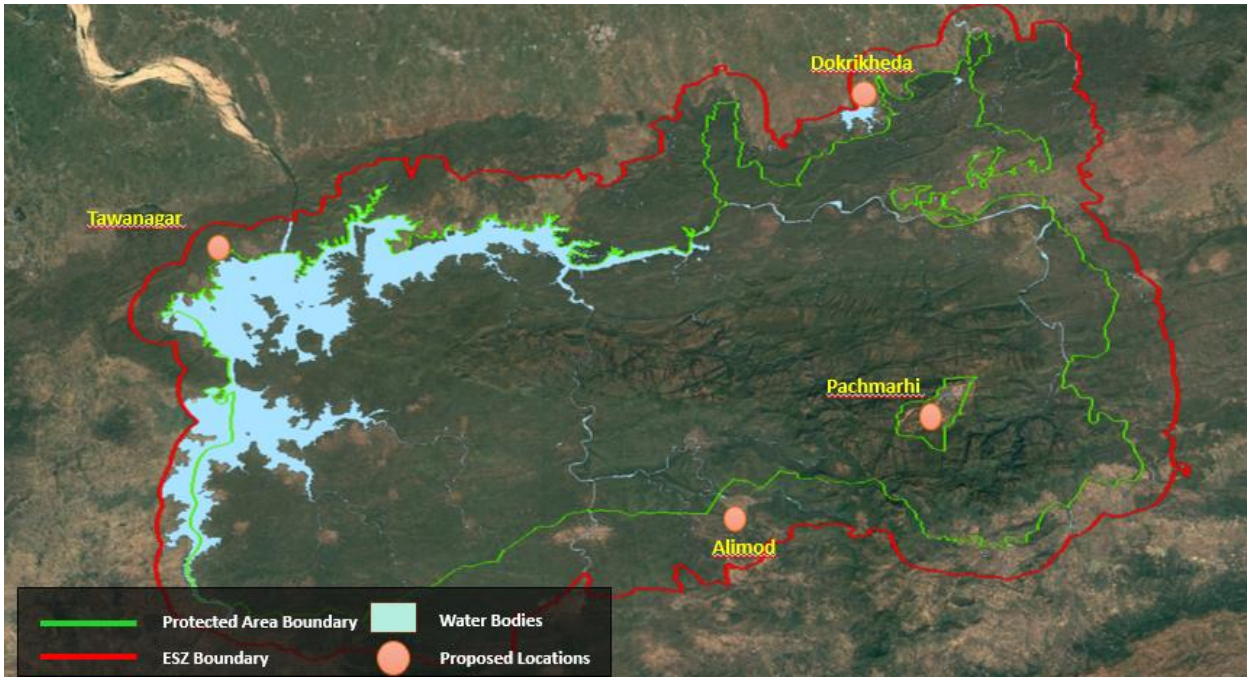


Figure 2- 12: Proposed potential location for butterfly park and Flower trails

Similar way, Butterfly Park along with Flower trails can be developed in potential places of Pachmarhi, Alimod, Dokrikheda and Tawanagar.

1.2.2.4.6 Animal Passageway

A road network to improve communication between villages, tourism sites and outer centres is proposed in STR. Many roads are newly proposed or widen for betterment of connectivity through vehicles in STR. 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 roadsides 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 passageways.

1.2.2.4.7 Poaching

The poaching in STR is discussed briefly in section 7.3.2 of chapter 7, Part:1 of report. To reduce the poaching in STR, 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. The private ventures and hospitals should be promoted in area for animal health and wellness.

1.2.3 THEME PLAN

1.2.3.1 Restoration of Soil Moisture Regime and Land Conservation

Table 3- 1: Soil nutrients in STR

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

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

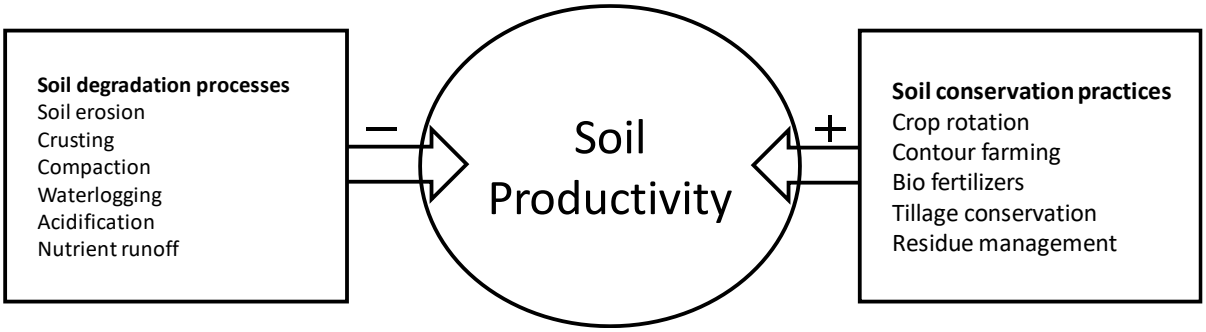


Figure 3- 1: Soil degradation and conservation

1.2.3.1.1 Suggestive measures for Soil conservation in Eco-Sensitive region

Soil conservation in Eco-Sensitive Zones 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.*
- *Education and Awareness:* Educating local populations on the importance of soil conservation, sustainable agriculture, and eco-friendly land management practices can foster long-term soil

health. *Example: Local NGOs in the Amazon region have successfully run awareness campaigns to reduce slash-and-burn practices that lead to soil degradation*.

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 practices are a set of soil management practices that minimize the disruption of the soil's structure, composition, and natural biodiversity. Despite high variability in the types of crops grown and specific management regimes, all forms of conservation agriculture share three core principles which are maintenance of permanent or semi-permanent soil cover (using either a previous crop residue or specifically growing a cover crop for this purpose); minimum soil disturbance through tillage (just enough to get the seed into the ground) and regular crop rotations to help combat the various biotic constrain.

Conservation Agriculture also uses or promotes where possible or needed various management practices like utilization of green manures/cover crops to produce the residue cover, no burning of crop residues, integrated disease and pest management, controlled/limited human and mechanical traffic over agricultural soils and promoting bio-fertilizers and bio-pests.

These agriculture practices are used by farmers one of the major environmental benefits is reduction in fossil fuel use and greenhouse gas (GHG) emissions. As well as reduction in power/energy needs of farmers who use manual or animal powered systems.

Apart from conservation agriculture, practices like double cropping, contour farming in hill areas soil stabilization and minimization of chemical fertilizers and pesticides should be practiced.

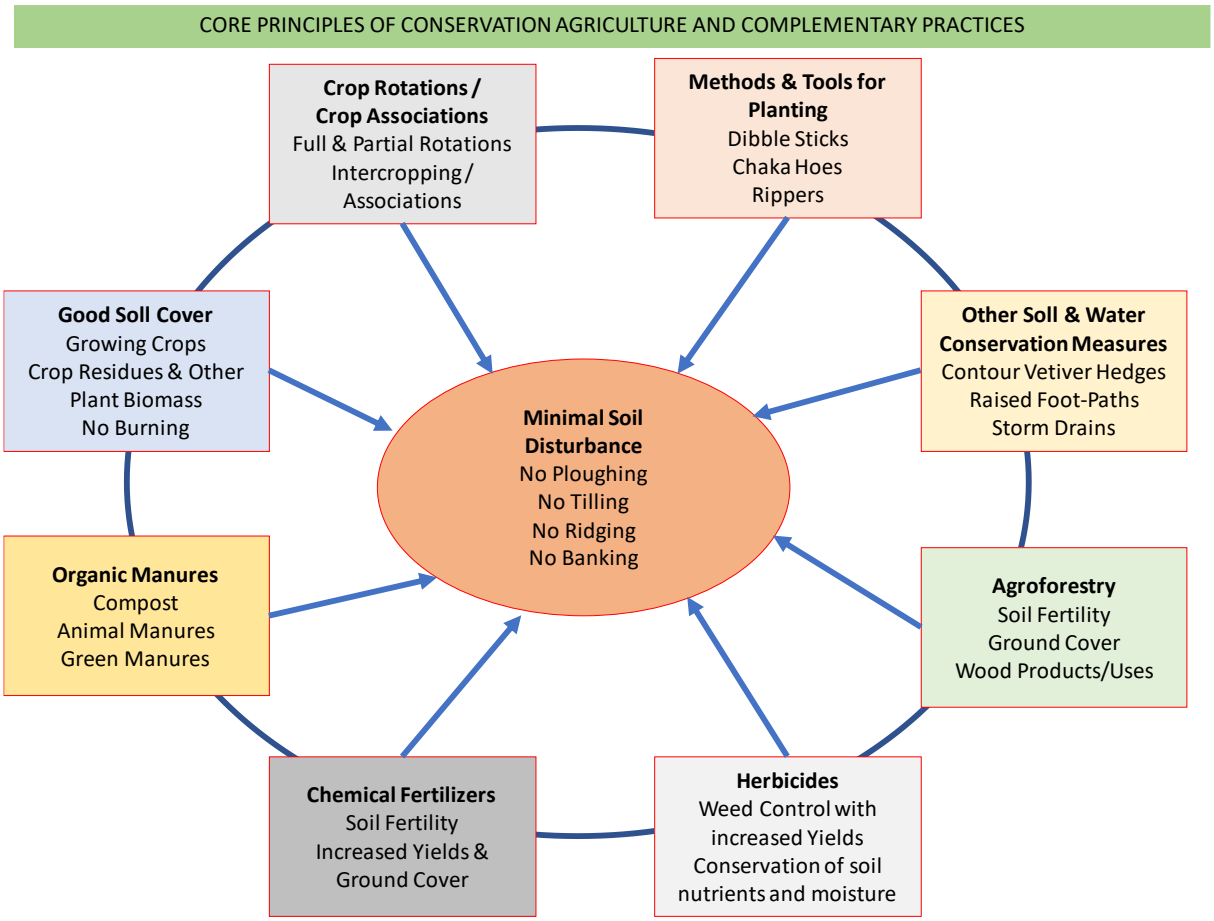


Figure 3- 2: Conservation Agriculture Practices

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 a 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.

Various methodologies of rainwater harvesting for rural area are as below chart.

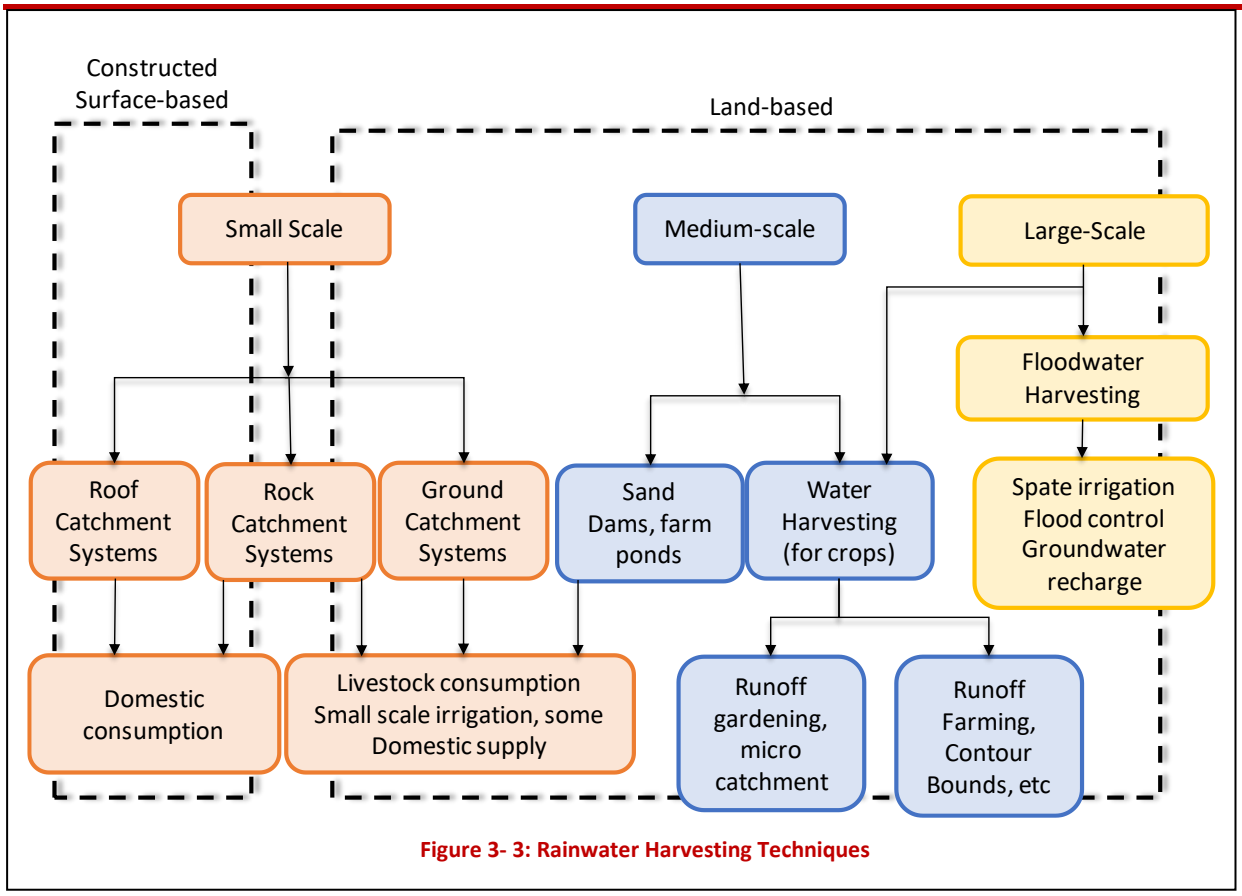
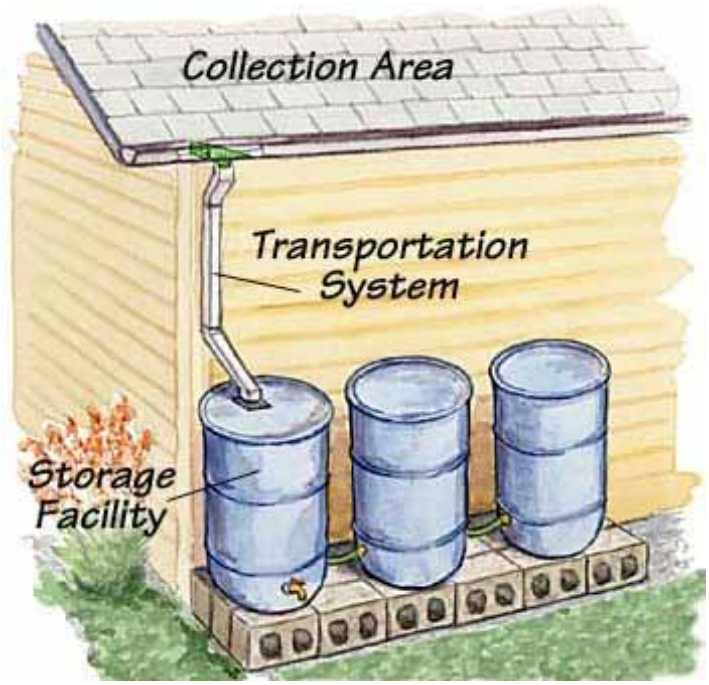


Figure 3- 3: Rainwater Harvesting Techniques

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 section- 11.15.2.

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. Average harvested water depends upon roof area and rainfall. This rainwater harvesting method should be adopted in resident area, commercial shops, hotels, resorts and government institutions.



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

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 adopted in resident area, commercial shops, hotels, resorts and government institutions.

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 11.2.

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.

Advantages		Disadvantages	
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.

These are only villages having drainage system in the villages are, Amadeh, Bori, Muharikala, Kamti, Ghogri, Urdaon, Kharpawad, Tawanagar, Daudi, Jhunkar, Chhatiaam, Khanchari, Jhirpa, Matkuli, Mohagaon & Pachmarhi. 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 is shown in table below

Table 3- 3: Village wise Wastewater Generation

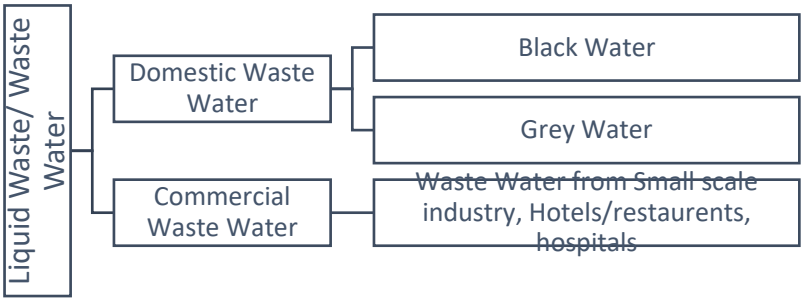
Sr. No.	Village	1991	2001	2011	2021	2031	Wastewater Generation (liters/ day)
1	Kharpawad	NA	268	341	418	453	30804
2	Urdon	245	344	434	566	714	88719
3	Mangaria	242	328	399	504	617	82131
4	Ghogri	254	337	437	569	722	49099
5	Kamti	707	744	771	807	841	57167
6	Sarangpur	350	415	516	635	772	92639
7	Tekapar Chourmahri	583	692	859	1056	1282	87196
8	Aanhoani	254	224	289	336	408	163683
9	Dokrikheda	322	446	418	445	437	573433
10	Choka	98	99	115	129	148	10040
11	Amadeh	69	97	139	195	263	17904
12	Raitwadi	238	312	349	414	475	32295
13	Bori	311	325	593	877	1268	86252
14	Madho	132	147	134	128	116	7882
15	Devi	116	109	137	159	191	12978
16	Chillod	149	174	200	233	268	63457
17	Khari	137	152	160	172	183	57705
18	Mohagaun	170	239	282	353	428	74312
19	Matkuli	2056	2423	2625	2943	3236	265307
20	Mehandikheda	NA	111	198	306	470	77200
21	Malli	105	140	188	250	324	67267
22	Bindakheda	NA	341	445	556	619	87332

Sr. No.	Village	1991	2001	2011	2021	2031	Wastewater Generation (liters/ day)
23	Jhirpa	849	1023	1131	1295	1453	144020
24	Khanchari	506	591	687	806	935	108804
25	Karer	232	303	314	353	380	71066
26	Chhirrai	241	322	371	451	531	81348
27	Tekapar	488	531	630	734	856	103472
28	Pisua	406	467	592	731	895	94149
29	Belkhedi	422	387	555	697	897	60969
30	Bijori	565	1020	1275	1794	2408	285311
31	Sangakheda	821	820	1150	1455	1860	329094
32	Nishan	617	588	797	976	1222	92900
33	Alimod	384	474	671	900	1184	147200
34	Baruth	314	409	545	717	921	62634
35	Pachmarhi	12495	11370	12062	12281	12955	1874295
36	Bardha	282	945	1191	2230	4245	342756
37	Dhasaii	386	532	612	750	888	114470
38	Kelipunji	530	697	577	540	433	29429
39	Tawanagar (Ranipur)	5248	5041	4561	4108	3595	633497
40	Daudi	NA	589	789	1184	1578	107304
41	Jhunkar	754	994	1276	1649	2077	141268
42	Anjandhana	NA	338	411	468	531	36108
43	Bhatodi	337	367	622	893	1257	85476
44	Chatua	214	272	358	465	590	40130
45	Chhatiaam	433	449	400	365	315	21401
46	Dundi	41	58	88	127	177	12051
47	Ghogri matha	235	270	359	456	574	39054
48	Maharajgang	239	355	416	528	644	43809
49	Kotmi	501	584	454	378	248	16891
50	Kursidhana	683	413	808	1119	1621	110254
51	Muharikala	575	507	547	559	598	40673
52	Muharikhurd	256	292	272	268	250	17023
53	Chicha	NA	625	884	1170	1564	106352
54	Nayagaon	938	1220	1368	1620	1861	126523
55	Pathai	170	198	231	271	315	21454
56	Sanghii	299	352	452	566	701	47657

Source: RADPFI Guidelines

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

Classification of wastewater and sources in villages of ESZ of STR 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- 5: Treatment of grey water in villages

Several technical options are describing treatment of grey water on site and off site, household level as well as community level.[2]

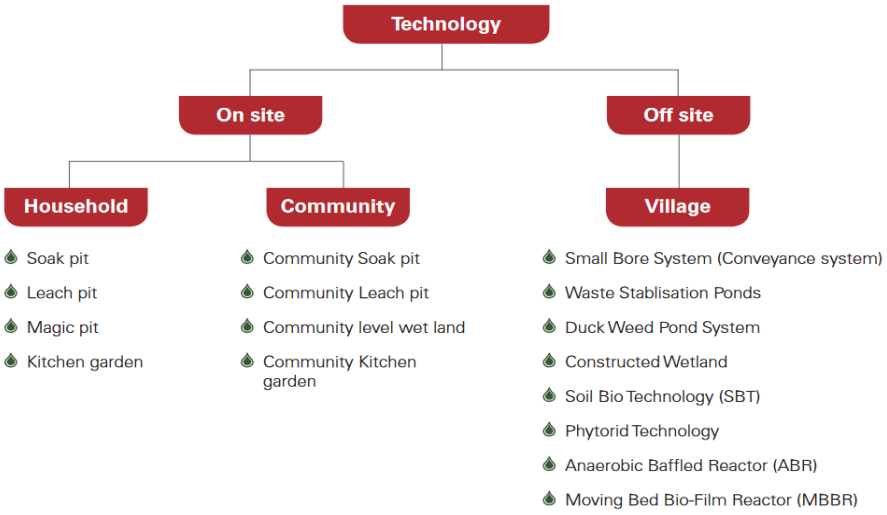


Figure 3- 6 : On site and Off-site Technological solutions for Grey Water Management in Villages

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.

[2] Grey Water Management in Rural India, Solid and Liquid Waste Management, Ministry of Drinking Water and Sanitation

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

1.2.3.4 Solid Waste Management/ Treatment

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[3]. For effective solid waste management, we have considered the maximum amount of solid waste generated per capita.

Currently only Pachmarhi has SWM system in entire STR. As per discussion with Superintendent Engineer, Cantonment Board, Pachmarhi, there is 10.12 quintal/ day solid waste is collected and getting dumped in 5 Acre landfill site near Pachmarhi.

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. Considering carrying capacity of the area and proposed accommodation facility, solid waste generation of individual villages is calculated. Solid waste generated at cluster level is as below

Table 3- 4: Village wise Solid Waste Generation:

Sr. No.	Village	1991	2001	2011	2021	2031	Solid Waste Generation
1	Kharpawad	NA	268	341	418	453	227
2	Urdon	245	344	434	566	714	636
3	Mangaria	242	328	399	504	617	587
4	Ghogri	254	337	437	569	722	361
5	Kamti	707	744	771	807	841	420
6	Sarangpur	350	415	516	635	772	665
7	Tekapar Chourmahri	583	692	859	1056	1282	641
8	Aanhoani	254	224	289	336	408	11531
9	Dokrikheda	322	446	418	445	437	45526
10	Choka	98	99	115	129	148	74
11	Amadeh	69	97	139	195	263	132
12	Raitwadi	238	312	349	414	475	237
13	Bori	311	325	593	877	1268	634
14	Madho	132	147	134	128	116	58
15	Devi	116	109	137	159	191	95
16	Chillod	149	174	200	233	268	448
17	Khari	137	152	160	172	183	406
18	Mohagaun	170	239	282	353	428	528
19	Bindakheda	NA	341	445	556	704	352
20	Matkuli	2056	2423	2625	2943	3236	1932
21	Mehandikheda	NA	111	198	306	470	549
22	Malli	105	140	188	250	324	476
23	Jhirpa	849	1023	1131	1295	1453	1040
24	Khanchari	506	591	687	806	935	782
25	Karer	232	303	314	353	380	504
26	Chhirrai	241	322	371	451	531	580

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

Sr. No.	Village	1991	2001	2011	2021	2031	Solid Waste Generation
27	Tekapar	488	531	630	734	856	742
28	Pisua	406	467	592	731	895	679
29	Belkhedi	422	387	555	697	897	448
30	Bijori	565	1020	1275	1794	2408	11334
31	Sangakheda	821	820	1150	1455	1860	17814
32	Nishan	617	588	797	976	1222	679
33	Alimod	384	474	671	900	1184	1055
34	Baruth	314	409	545	717	921	461
35	Pachmarhi	12495	11370	12062	12281	12955	9777
36	Bardha	282	945	1191	2230	4245	2498
37	Dhasaii	386	532	612	750	888	820
38	Kelipunji	530	697	577	540	433	216
39	Tawanagar (Ranipur)	5248	5041	4561	4108	3595	22236
40	Daudi	NA	589	789	1184	1578	789
41	Jhunkar	754	994	1276	1649	2077	1039
42	Anjandhana	NA	338	411	468	531	266
43	Bhatodi	337	367	622	893	1257	629
44	Chatua	214	272	358	465	590	295
45	Chhatiaam	433	449	400	365	315	157
46	Dundi	41	58	88	Relocated Village		
47	Ghogri matha	235	270	359	456	574	287
48	Maharajgang	239	355	416	528	644	322
49	Kotmi	501	584	454	378	248	124
50	Kursidhana	683	413	808	1119	1621	811
51	Muharikala	575	507	547	559	598	299
52	Muharikhurd	256	292	272	268	250	125
53	Chicha	NA	625	884	1170	1564	782
54	Nayagaon	938	1220	1368	1620	1861	930
55	Pathai	170	198	231	Relocated Village		
56	Sanghii	299	352	452	566	701	350

Source: RADPFI Guidelines

From primary survey it has come to know that there is no provision of solid and liquid waste management in most of the villages of ESZ of STR. 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 largely populated area and tourist destination, Only Pachmarhi is having solid waste management collection system in the town as well as 5 acre dumping site in the town. But there is no solid waste treatment facility in the town. Also, there is lack of liquid waste management in the villages of ESZ.

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

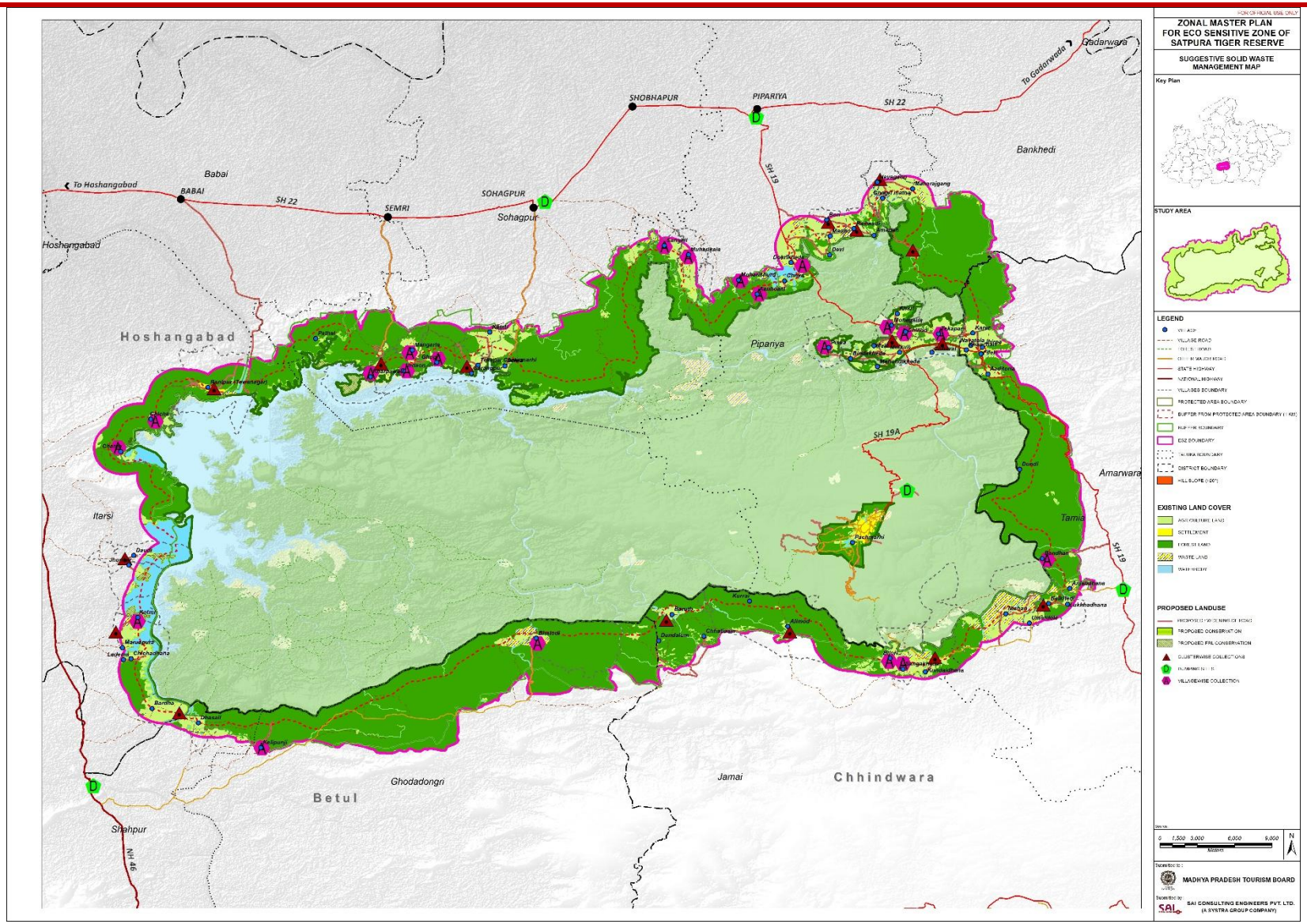


Figure 3- 7: Suggestive Solid Waste Management Map

The above map indicates solid waste management in ESZ of STR. 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 except existing landfill site at Pachmarhi

Being a rural area, generally types of waste is classified as below:

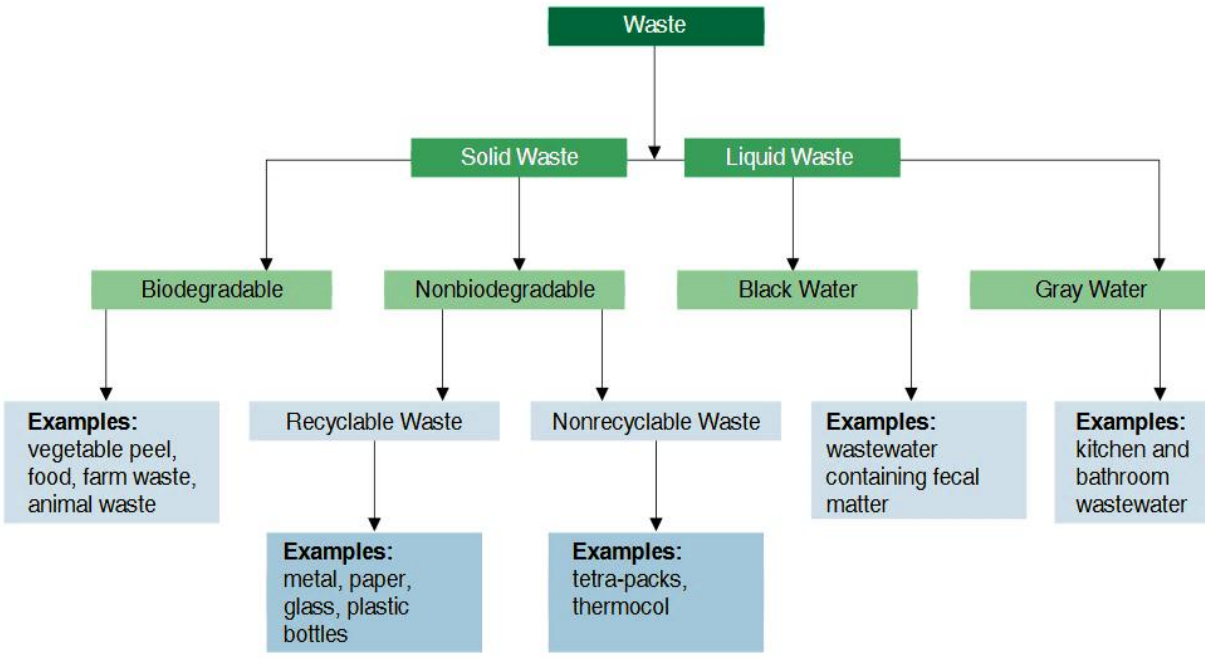


Figure 3- 8: Classification of Waste in Rural Area

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. It should be strictly prohibited to dump waste in open areas and a proper fine system to be introduced by the governing authority.

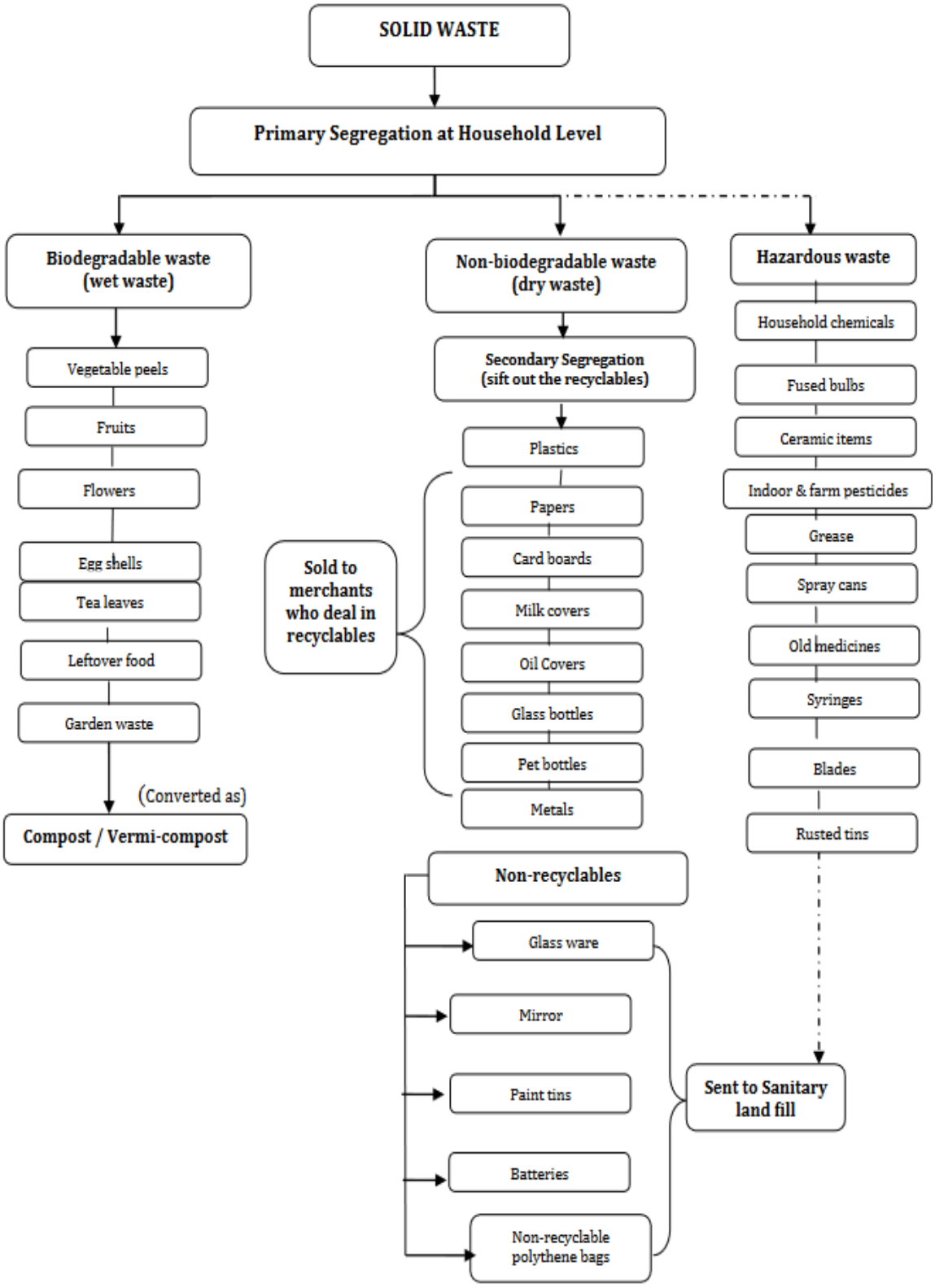


Figure 3- 9 : Solid Waste Management in villages

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- 10: 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.

Table 3- 5: Various technologies for SWM in rural areas

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.

Technology	Description
	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 fuel 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 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 Garmin), which enables technical, financial and administrative support from state level to district level to block level.

Level	*Organisation*
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
	Households

1.2.3.5 Management of Water Supply, Drainage and Storm Water

Physical infrastructure includes roads, drinking water supply and sanitation, solid waste management, storm water drains etc. Physical infrastructure is basic need of the villages.

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.

Table 3- 6: List of clusters and villages for physical infrastructure are as shown in the table below:

Cluster	Villages
Cluster-1	Kharpawad, Urdon, Mangaria, Ghogri
Cluster-2	Kamti, Sarangpur, Tekapar Chourmahri
Cluster-3	Aanhoani, Dokrikheda
Cluster-4	Amadeh, Raitwadi, Bori, Madho, Devi
Cluster-5	Chillod, Khari, Mohagaun, Bindakheda, Matkuli, Mehandikheda, Malli, Bindakheda, Pisa
Cluster-6	Jhirpa, Khanchari, Karer, Tekapar, Chhirai
Cluster-7	Nishan, Belkhedi
Cluster-8	Bijori, Sangakheda
Cluster-9	Pachmarhi
Cluster-10	Tawanagar (Ranipur)
Cluster-11	Daudi, Jhunkar
Cluster-12	Bardha, Dhasaii
Other Villages	Alimod, Anjandhana, Baruth, Belkhedi, Bhatodi, Chatua, Choka, Chhatiaam, Chichadhana, Dundi, Ghogri matha, Kelipunji, Maharajgang, Kotmi, Kursidhana, Muharikala, Muharikhurd, Chicha, Nayagaon, Pathai, Sanghii

1.2.3.5.1 Water Supply

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

Table 3- 7: 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

Water Supply demand has been calculated for clusters and individual villages in the table below:

Table 3- 8: Total Water Supply Requirement

Sr. No.	Village	1991	2001	2011	2021	2031	Total Water Supply Requirement
1	Kharpawad	NA	268	341	418	453	38505
2	Urdon	245	344	434	566	714	110898
3	Mangaria	242	328	399	504	617	102664
4	Ghogri	254	337	437	569	722	61374
5	Kamti	707	744	771	807	841	71459
6	Sarangpur	350	415	516	635	772	115798
7	Tekapar Chourmahri	583	692	859	1056	1282	108995
8	Aanhoani	254	224	289	336	408	204603
9	Dokrikheda	322	446	418	445	437	716791
10	Choka	98	99	115	129	148	12550
11	Amadeh	69	97	139	195	263	22380
12	Raitwadi	238	312	349	414	475	40369
13	Bori	311	325	593	877	1268	107815
14	Madho	132	147	134	128	116	9853
15	Devi	116	109	137	159	191	16223
16	Chillod	149	174	200	233	268	79321
17	Khari	137	152	160	172	183	72132
18	Mohagaun	170	239	282	353	428	92890
19	Matkuli	2056	2423	2625	2943	3236	331634
20	Mehandikheda	NA	111	198	306	470	96500
21	Malli	105	140	188	250	324	84083
22	Bindakheda	NA	341	445	556	619	109165
23	Jhirpa	849	1023	1131	1295	1453	180025
24	Khanchari	506	591	687	806	935	136005
25	Karer	232	303	314	353	380	88833
26	Chhirrai	241	322	371	451	531	101685
27	Tekapar	488	531	630	734	856	129339
28	Pisua	406	467	592	731	895	117686
29	Bijori	565	1020	1275	1794	2408	356639
30	Sangakheda	821	820	1150	1455	1860	411368
31	Nishan	617	588	797	976	1222	116126
32	Alimod	384	474	671	900	1184	184000
33	Baruth	314	409	545	717	921	78292
34	Pachmarhi	12495	11370	12062	12281	12955	2342869
35	Bardha	282	945	1191	2230	4245	428445
36	Dhasaii	386	532	612	750	888	143088
37	Kelipunji	530	697	577	540	433	36786
38	Tawanagar (Ranipur)	5248	5041	4561	4108	3595	791871

Sr. No.	Village	1991	2001	2011	2021	2031	Total Water Supply Requirement
39	Daudi	NA	589	789	1184	1578	134130
40	Jhunkar	754	994	1276	1649	2077	176585
41	Anjandhana	NA	338	411	468	531	45135
42	Belkhedi	422	387	555	697	897	76211
43	Bhatodi	337	367	622	893	1257	106845
44	Chatua	214	272	358	465	590	50163
45	Chhatiaam	433	449	400	365	315	26751
46	Dundi	41	58	88	127	177	15064
47	Ghogri matha	235	270	359	456	574	48817
48	Maharajgang	239	355	416	528	644	54762
49	Kotmi	501	584	454	378	248	21114
50	Kursidhana	683	413	808	1119	1621	137817
51	Muharikala	575	507	547	559	598	50841
52	Muharikhurd	256	292	272	268	250	21279
53	Chicha	NA	625	884	1170	1564	132940
54	Nayagaon	938	1220	1368	1620	1861	158153
55	Pathai	170	198	231	271	315	26817
56	Sanghii	299	352	452	566	701	59571

Source: RADPFI Guidlines

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[4].

There are various models available for water supply in villages. Some of them are described 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: Tawanagar, Baruth, Alimod, Bijori, Jhirpa, Khanchari, & Pachmarhi.

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).

[4] NRDWP Guidelines, 2013

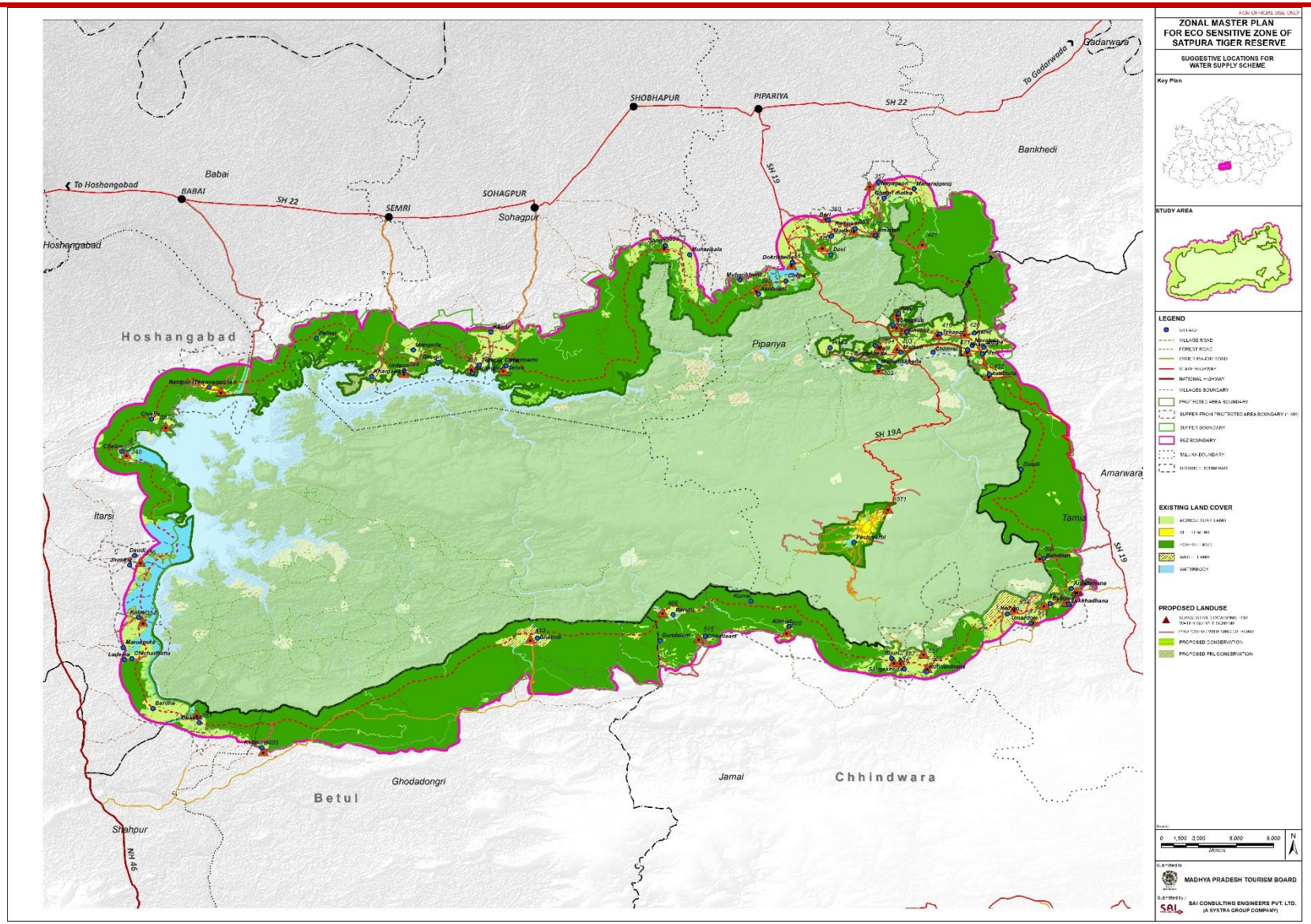


Figure 3- 11: Proposed Clusters for Water supply network

1.2.3.5.2 Sanitation in villages of ESZ

Under the Swachh Bharat Mission, most households in villages within the ESZ of STR now have individual toilets, contributing to achieving SDG-6 (Clean Water and Sanitation).

Figure 3- 12 : Proposed Community Toilets in villages of ESZ

1.2.3.6 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- 9: 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

Suggestive locations for schools are proposed in the map below. Health facilities in rural area have always been a crucial factor for development for a village. Basic health facilities should be provided in the villages. Health clinics, mobile clinics etc. can be provided in the small villages on AlterNet days or weekly basis. From primary survey it has come to know that there are many villages in STR not having any health facilities. Villages should be provided with better Mobile network Coverage.

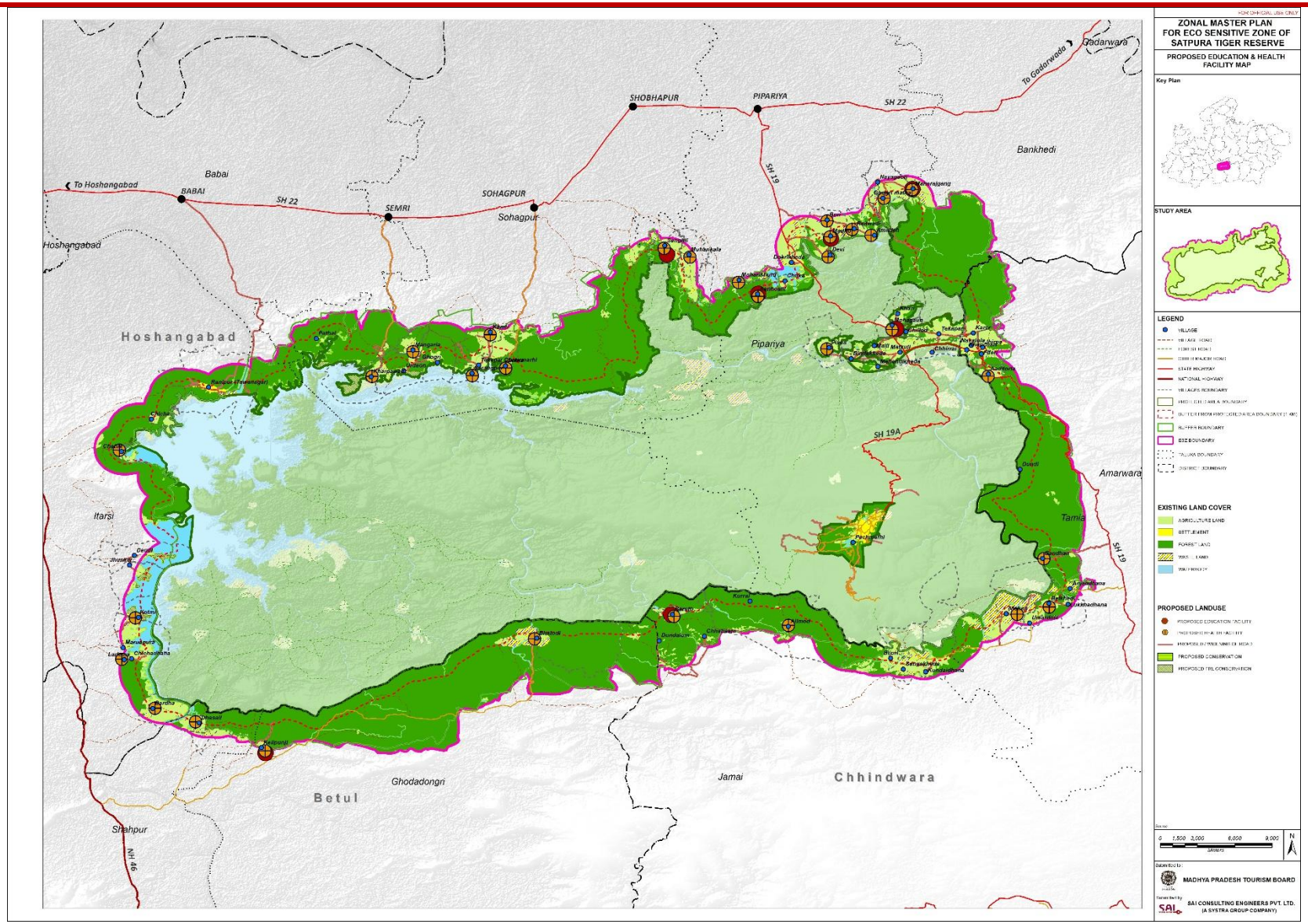


Figure 3- 13: Education Facility (up to 8t

1.2.3.6.1 Haat Bazar

A village haat is a far more vibrant and dynamic place for grocery shopping than a typical supermarket. It's not just an economic hub but also a center for social interactions. From organic produce to fresh river fish, and even jewelry or flip-flops, the haat offers a wide range of products. Each week, people from remote villages travel by bus, rickshaw, or bike to sell their goods, while locals from surrounding areas come to buy necessities.

Table 3- 10: The table below shows location of haat bazar and its serving area in ESZ of STR[5].

S. No.	Name of Haat Bazar	Market Day	Catchment Area villages
1	Tawanagar	Sunday	Chicha, Chatwa Chandrakhar, Jijadoh, Madikhoh
2	Pachmarhi	Thursday	Pachmarhi, Bariaam, Jhela Khamkhedi, Mahadeo, Kajri, Ghodanar, Pagara
3	Matkuli	Wednesday	Matkuli, Chandan Pipariya, Mohgaon, Singanama, Ghoghri Maili Katiyadhana, Ghana, Chakar,Tendukheda, Mogra, Raikheda, Khari
4	Jhirpa	Saturday	Jhirpa, Tekapar, Manakachar, Fiferi, Mohgaon, Chilloud,

Source: Consultant Analysis

1.2.3.7 Vehicular Traffic Control

1.2.3.7.1 Proposal for Road widening and improvement of roads

As stated in IRC SP 20, A habitat is connected only it has an access through all-weather Road. A road network basically consists of links of roads of various categories, such as, National Highways, State Highways, Major District Roads, and Rural Roads. Roads, therefore, become links of a network, which facilitate the essential movements of persons and goods in an area, and no individual road link can serve the same purpose when developed in isolation. A road network, therefore, needs to be developed in such a way that the travel needs of the people or community in an area are met to the maximum in a collective way at the lowest cost of development. In the rural areas of STR, major part of their travel needs is comprised of travel to marketplace, education centre and health centre. Additionally, these links can be helpful to develop tourism at potential places. Thus, creation of an optimal road network is to be aimed to serve the habitations for access to such needs through Eco-Sensitive Zonal Master Plan.

Roads connecting to state highway/ National Highway are preferred to propose or widen to 12 m, Road connecting to 12 m road or road are preferred to propose or widen to 9 m and other linkage roads are preferred to propose or widen to 7.5 m. While attempting to optimize the road network, each unconnected habitation must be connected to the existing all-weather road network or already connected habitations in an efficient way. The Kachha Road in forest area to be converted to Water Bound MacDam Roads.

Table 3- 11: Proposed widening and new proposed road in Satpura Tiger Reserve

[5] Core Forest Plan, Satpura Tiger Reserve

Route Number	Villages	Proposed Widening length (m)		Proposed New Road Length		Kachcha Road Length	Pakka Road Length	WBM Road Length	Total Length
		7.5 m	9m	7.5m	9m	(m)	(m)	(m)	(m)
Route 1	Kharpawad-Mangaria-Urdaon		7299		1649				8948
Route2	Kamti-Sehra		5455		0				5455
	Kamti-Ghogri		5319		0				5319
	Kamti-Tekapar-Sarangpur		5890		0				5890
	Ghogri-Tekapar		4111		2592				6703
Route3	Matkuli-Bindakheda-Pisua		0		6601				6601
	Matkuli-Mohgaon-Khari		0	1728	345				2073
	Matkuli-Malli		0		2038				2038
	Matkuli-Dokhrikheda-Choka- Aanhoni-Muharikhurd-Sanghli		16128	2779	345				19252
	Matkuli-Chillod-Tekapar		0		3804				3804
Route 3.1	Bori-Madho-Devi		0		3539				3539
	Bori-Amadeh-Ghoghari matha- Maharajgang		0		10153	1575			11728
Route 4	Matkuli-Panchmarhi		0		345		37548		37893
	Matkuli-Mehandikheda		0	1792	713				2505
Route 5	Matkuli-Chhirai-Khanchari- Navatola-Jhirpa-Fiferi-Aditoria		0	826	690	2600			4116
	Matkuli-Karer		0		2207				2207
Route 6	Sangakheda-Alimod-Baruth		26449		1255				27704
	Sangakheda-Bijori		0		0		1521		1521
	Sangakheda-Chhataam		39646		0				39646
	Sangakheda-Belkhedi		12706		300				13006
	Sangakheda-Kundaldhana-Nishan		8944	1401	3162				13507
	Sangakheda-Kurrai		16630		1255	4500			22385
	Sangakheda-Dandium		31166		2294				33460
Route 7	Kelipunji-Bhatodi		23223		6090				29313
Route 8	Dasai-Bardha		0		3747				3747
	Ranipur (Tawanagar)-Chicha- Chatua		7497	556	2868				10921
Route 9	Chichadhana-Daudi-Jhunkar		43318		2215				45533
Route 9.1	Chichadhana-Maruapura-Kotmi		1263	2556	1309				5128
	Chichadhana-ladema		0		794				794
	Daudi-Chatua-Chicha				22316				22316

Note: Proposed widening and new proposed road will be as per decision/prior permission by forest department and NTCA guidelines

Total length of newly Proposed Roads are 94.26 km and 255.04 km of roads are proposed to widen in Eco-Sensitive Zone of Satpura Tiger Reserve.

The thematic road section for 9 m is shown as below in figure 11.40 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.

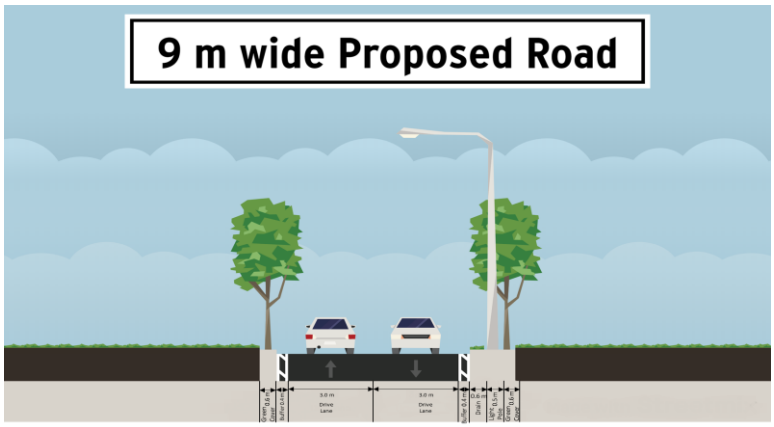


Figure 3- 14: Thematic diagram of 9 m wide road section

The thematic road section for 7.5 m is shown as below in figure 11.41 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.

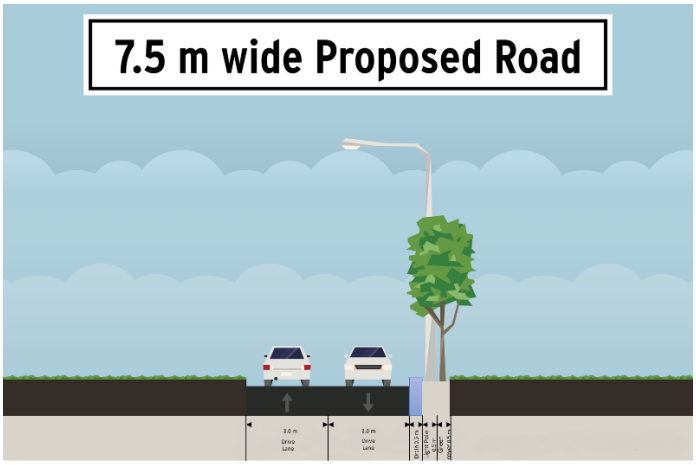


Figure 3- 15: Thematic diagram of 7 m wide road section

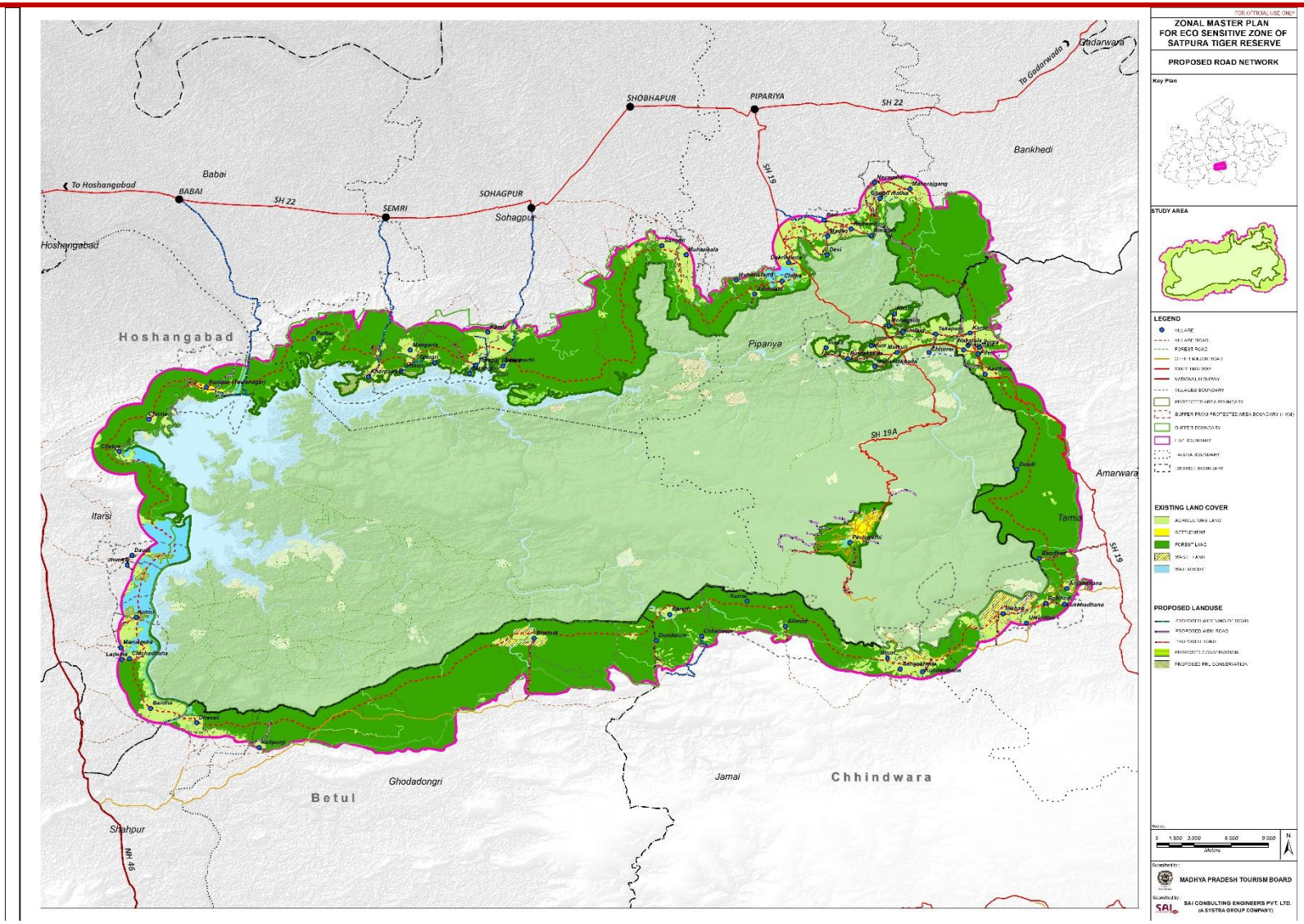


Figure 3- 16:Proposed Road Network

1.2.3.7.2 Proposal for Bus stop

Matkuli is a village which falls on SH19A, which has been connected with Pipariya at one end and at another end connects with Pachmarhi. Matkuli also has connectivity with SH19 which directly connect with Tamia and Chhindwara.

As most of the villages are lacking mass transportation in Satpura Tiger Reserve, there are very less bus stop available in villages. It is necessary to provide a mass transportation facility to the region. As per the demand, the bus stop can be developed to cater all the villagers, Tourist and commuters.

1.2.3.7.3 Proposals for Conservation and Safety

Satpura Tiger Reserve has the very diverse biodiversity in flora and fauna both. As the road network and traffic develops in area may create wildlife-human conflicts. To avoid the conflict, physical as well as policy measures to control animals as well as human behaviour has been proposed as per guidelines by MoEFCC and Wildlife Institute of India in Satpura Tiger Reserve. This will help to safeguard humans as well as nature.

Whole Satpura Tiger Reserve is divided in zones for the proposal of structure in areas. The zones are decided on basis of factors like presence of forest, presence of wild animals, occupancy of the wild animal in area, Proposed and existing tourism sites and green corridors in the area.

The zones can be classified as follow:

1. **Forest Zone:**
   The area included under this zone are reserve forest and having the animal movements and occupancy. Forest zone has the area which has green corridor connectivity for Pench and Melghat. This area are sensitive areas for wildlife movement. This zone includes Dhasai, Kelipunji, Bhatodi, Dandalum, Dundi, Aanhoni, Ranipur(Tawanagar), Chicha, Chatua, Daudi, Jhunkar, Kotmi, Maruapura, Ladema and Bardha.
2. **Forest and Tourism zones**
   The area included in this zone has the forest cover but important for potential existing and proposed tourism sites also. This causes the human interference to area and more traffic to area. Baruth, Chhatiam, Kurai, Alimod, Gutkheda, Anjhandhana and Bandhan from south of Satpura Tiger Reserve. Kharpawad, Pathai, Mangaria, Urdon, Ghogri, Tekapar Chaurmarhi, Sarangpur, Kamti and Sehra from Madhai area which have animal spotting and movements are considered under this zone.
3. **Agriculture zone**
   The area which has only agriculture and very less forest as well as very less occupancy of the wild animals is considered in this zone. This area has very less wild animal presence and movement in the area. Sanghii, Muharikala, Choka, Dokrikheda, Madho, Bori, Raitwari, Amadeh, Ghogri matha, Nayegaon and Maharajganj has predominantly agriculture area and very less forest area. In southern STR, Bijori, Sangakheda, Kundaidhana, Nishan, Umardole, Belkhedi and Lukhadhana have the most agriculture land and less of the forest area.
4. **Matkuli zone**
   By having protected area at three sides, Matkuli cluster has animal occupancy as well as traffic for the area. Because of connectivity to Pachmarhi and Proposal for commercial also causes vehicular movements on the roads. The zone includes villages like Pisua, Bindakheda, Mehandikheda, Malli, Matkuli, Chillod, Moahgaon, Khari, Chhirai, Tekapar, Karer, Navatola, Khanchari, Jhirpa, Fiferi, Aaditoria and Neksa.

1.2.3.7.4 Signages

1. **Forest Zone:**
   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.
2. **Forest and Tourism zones**

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. Signage for the presence of animal should also provide at tourism sites and nearby area to acknowledge the people.

3. **Agriculture zone**

   Agriculture areas have the minimum occupancy except the wild pigs. The signages in this area should only provide on major roads at distance of 5 km.

4. **Matkuli zone and Pachmarhi Zone**

   This zone has the numbers of monkeys in area of Matkuli and surrounding. The signages in the area should be developed at 1 km and signages for silence zone in late evening should be provided.

1.2.3.7.5 Speed Breakers

1. **Forest Zone:**

   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 3 – 4 km, on 9 m and 7.5m wide road speed breaker can be provided at 5-6 km distance. Speed breaker at both end of wildlife passage structure at distance of 500 m should be provided. Additional to these, reduce the speed humps and rumble strips can be provide at distance of 5 km.

2. **Forest and Tourism zones**

   Apart from speed breaker provided as per forest area, it should be provided near tourism sites 500 m before the entry.

3. **Agriculture zone**

   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.

4. **Matkuli zone and Pachmarhi Zone**

   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 2 – 4 km, on 9 m and 7.5m wide road speed breaker can be provided at 3-5 km distance. Speed breaker at both end of wildlife passage structure at distance of 500 m should be provided.

1.2.3.7.6 Fencing

It is common practice in forest area to make a boulder or sandbag as fencing to avoid the interference of animal in some of the areas. It helps to direct animals away from roads or railways. This practice can be suggestive to avoid the interference and accidents of animal. Fencing can be developed along entire linear infrastructure or can be developed among the known animal passing sections only. Height, width and material can be used as per type and movement of the animal species. The boulder fencing can be built at distance of 300 m from the road in forest areas. This is helpful to protect the animals entering on roads. The fences are best is use with wildlife animal crossing structures.

Figure 3- 17: Photos for Various types of fences in forest area

1.2.3.7.7 Wildlife Passages

Proposed Wildlife Passage Structure in Eco-Sensitive Zone

1. Forest Zone:

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.

2. Forest and Tourism zones

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 Tawa reservoir and Parsapani area Glider poles for birds can be provided at suitable distance of 250m-500m.

3. Agriculture zone

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.

4. Matkuli zone

Matkuli zone have the high numbers of monkeys in area. There is also presence of small and medium mammals in area in less numbers. For Passage to wild animals, alternate box culvert, canopy bridge and pipe structure is more suitable. On 12 m road, box culvert can be provided at suitable distance of 800 m – 2 km, on 9 m road it can be provided at suitable distance of 1 km – 3 km and on 7.5 m wide road box culvert can be provided at distance of 2 km – 4 km. The canopy bridge and pipe structure can be provided as per presence of animals at suitable distance of 200-400 m on 12 m road, 300 m – 800 m 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 Management of Resource Extraction

Satpura 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 Satpura Tiger Reserve is prohibited and designated as illegal activity.

As mentioned in gazette notification no. S.O. 2538(E), commercial mining, hydroelectric projects, sawmills, brick kilns and collection of firewood for commercial purpose has been restricted. As these mentioned activities can be hazardous to natural resources of STR because of unregulated extraction. Collection of MFPs are allowed under applicable forest law in certain limitation for livelihood of local community. Below table provides brief about prohibited and regulated activities based on resource extraction.

Table 3- 12: 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	Prohibited 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.	Prohibited 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

1.2.3.9 Surface and Ground Water Withdrawal

The extraction/storage of surface water is prohibited in Protected Area of Satpura Tiger Reserve. The area of ESZ is majorly dependent on ground water for domestic as well as agricultural needs.

1.2.3.10 Protection to the Source of Water

Satpura Tiger Reserve has unique landscape with mountains, rivers and other natural features. Rivers like Denwa and Tawa with many streams flows through the STR as potential water source to animals as well as villagers. The region has the Tawa reservoir and Dokrikheda as large potential surface water storage. The area is blessed with approximate rainfall of 1200 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.

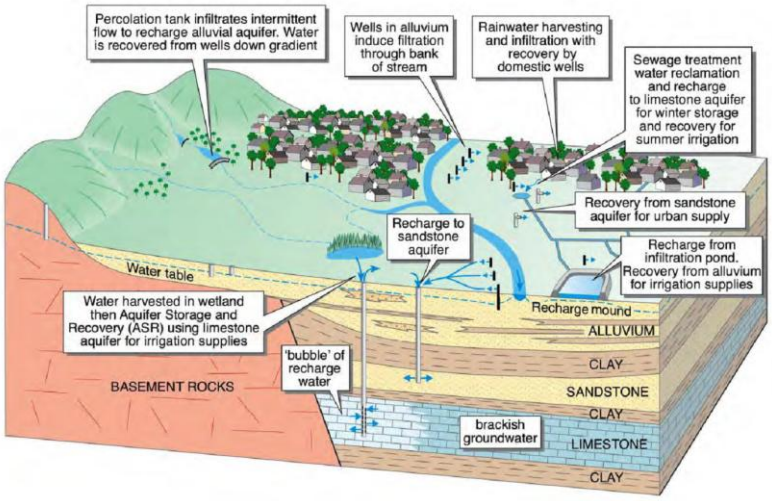


Figure 3- 18: Proposed water resource management in STR

1.2.3.10.1 Surface water

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

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 15 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.

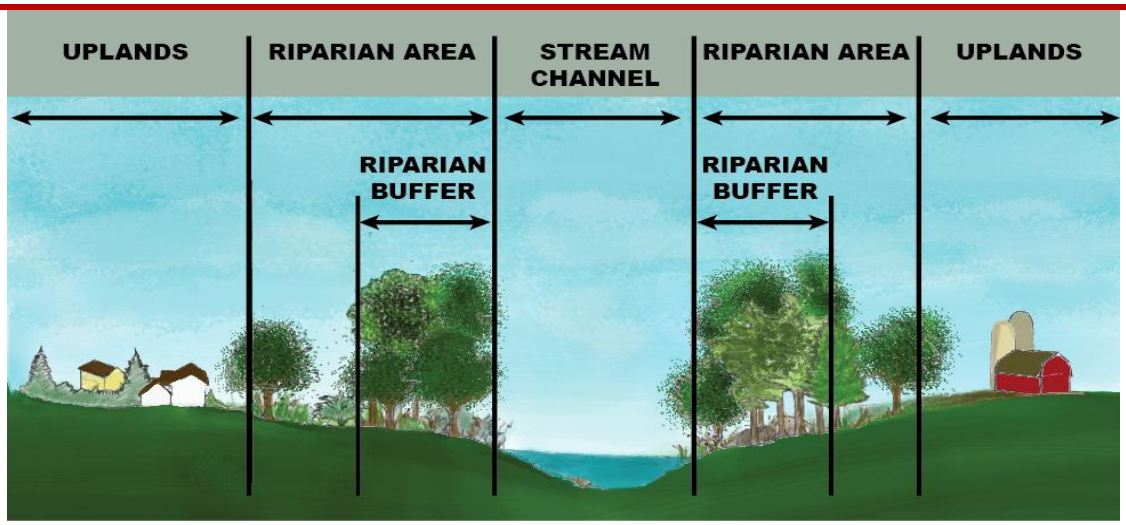


Figure 3- 19: Conceptual riparian buffer diagram

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. The image below describes the scenario for riparian buffer.

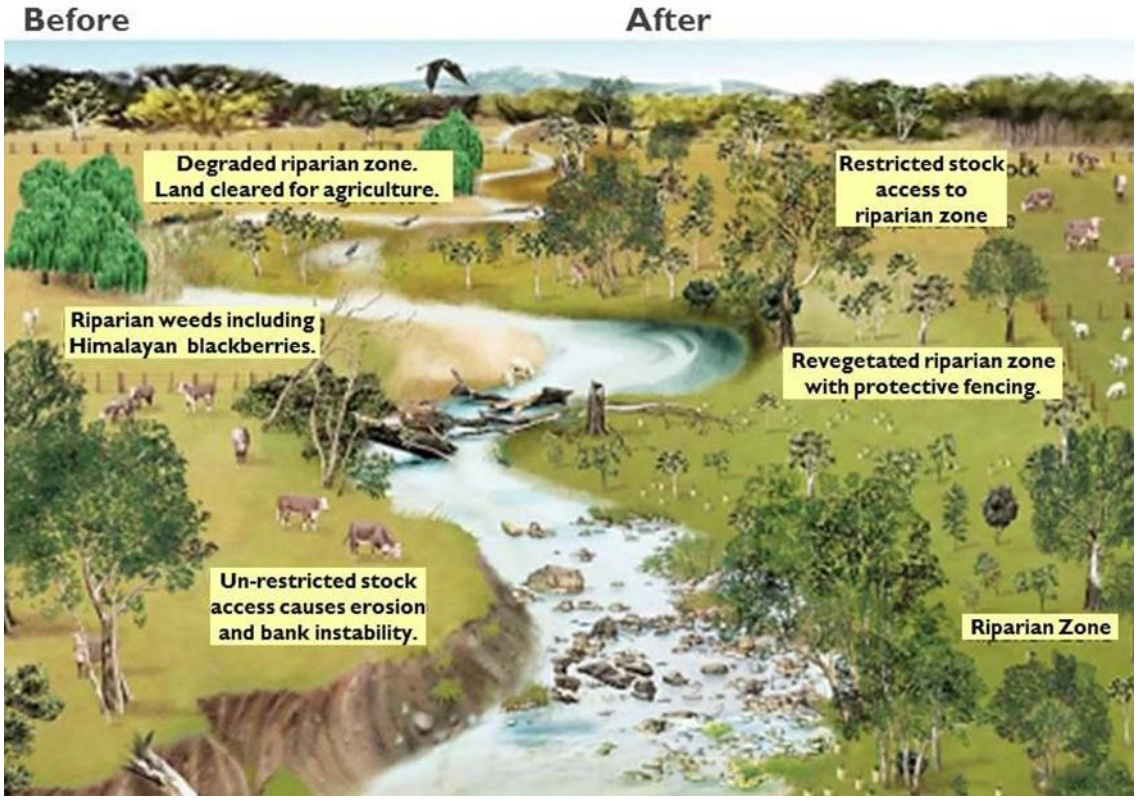


Figure 3- 20:Effects for Riparian zone

Reservoirs

STR has one reservoir named Tawa reservoir near to Ranipur- Tawanagar village. A buffer of 50 meters is provided from Full Tank Level i.e.328 meters is proposed in surrounding area of reservoirs in Eco-sensitive zone area.

Tawa Reservoir is recognized as a Ramsar Site, which is a designation given to wetlands of international importance under the Ramsar Convention on 24-08-2024. The reservoir is Located in the state of Madhya Pradesh, India, the reservoir is a vital ecosystem that supports diverse flora and fauna, including migratory bird species. It serves as an important water source for local communities and plays a key role in maintaining biodiversity in the region. The reservoir's wetlands are crucial for flood control, groundwater recharge, and maintaining water quality. The Regulation activity around the Tawa Reservoir is applicable as per Wetland (Conservation and Management) Rules ,2017.

The Wetlands (Conservation and Management) Rules, 2017 - Under these rules, any development activity near wetlands, especially those designated as Ramsar Sites, is strictly regulated. The rules emphasize the need for environmental impact assessments (EIA) and mandate that activities must not interfere with the ecological functions of wetlands. In these guidelines mentioned about prohibited, regulated and permitted activities around water bodies.

- **Prohibited Activities in Wetland**

a) Conversion for non-wetland uses including encroachment of any kind
b) Setting up of any industry and expansion of existing industries.
c) Manufacture or handling or storage or disposal of construction and demolition waste covered under the Construction and Demolition Waste Management Rules, 2016; hazardous substances covered under the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 or the Rules for the Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms/Genetically Engineered Organisms or cells, 1989 or the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008; electronic waste covered under the E-Waste (Management) Rules, 2016
d) Solid waste dumping
e) Discharge of untreated wastes and effluents from industries, cities, towns, villages and other human settlements
f) Any construction of a permanent nature except for boat jetties within fifty metres from the mean high flood level observed in the past ten years calculated from the date of commencement of these rules; and
g) Poaching.

- **Developing a list of activities, to be regulated in a notified wetland:**

Sl.No	Activity (Indicative List)	Aspect on which threshold can be specified
a	Subsistence level biomass harvesting (including traditional practices)	• Number of people that can be permitted to harvest biomass within the wetlands • Type of harvesting gears (mesh size) and crafts • Area wherein harvesting is permitted
b	Sustainable culture-based fisheries practices	• Area wherein culture-based fisheries is permitted • Stocking density • Water quality
c	Plying of non-motorized boats	• Area wherein plying is permitted • Number of boats

Sl.No	Activity (Indicative List)	Aspect on which threshold can be specified
d	Desilting, in cases where wetlands inflow regimes and water holding capacity are impacted by siltation	• Area wherein desilting can be carried out
e	Construction of temporary nature	• Area wherein temporary constructions can be carried out • The period for which such structure can be maintained inside the notified wetlands

Source: Wetland Rules 2017

- **Developing a list of activities permitted in a notified wetland**

a) Ecological rehabilitation and rewilding of nature
b) Wetlands inventory, assessment and monitoring.
c) Research
d) Communication, environmental education and participation activities
e) Management planning
f) Habitat management and conservation of wetland-dependent species
g) Community-based ecotourism (with minimum construction activities);
h) Harvesting of wetlands products within regenerative capacity; and
i) Integrating wetlands as nature-based solutions for climate change mitigation and adaptation

1.2.3.10.2 Ground water

Ground water situation in STR is recharged naturally from surface water because of its undulating landscape. But as the region is hilly and having high slopes, run-off from rainwater is high. As per availability of data, the Ground water level for ESZ notified villages are as shown in Figure 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 STR.

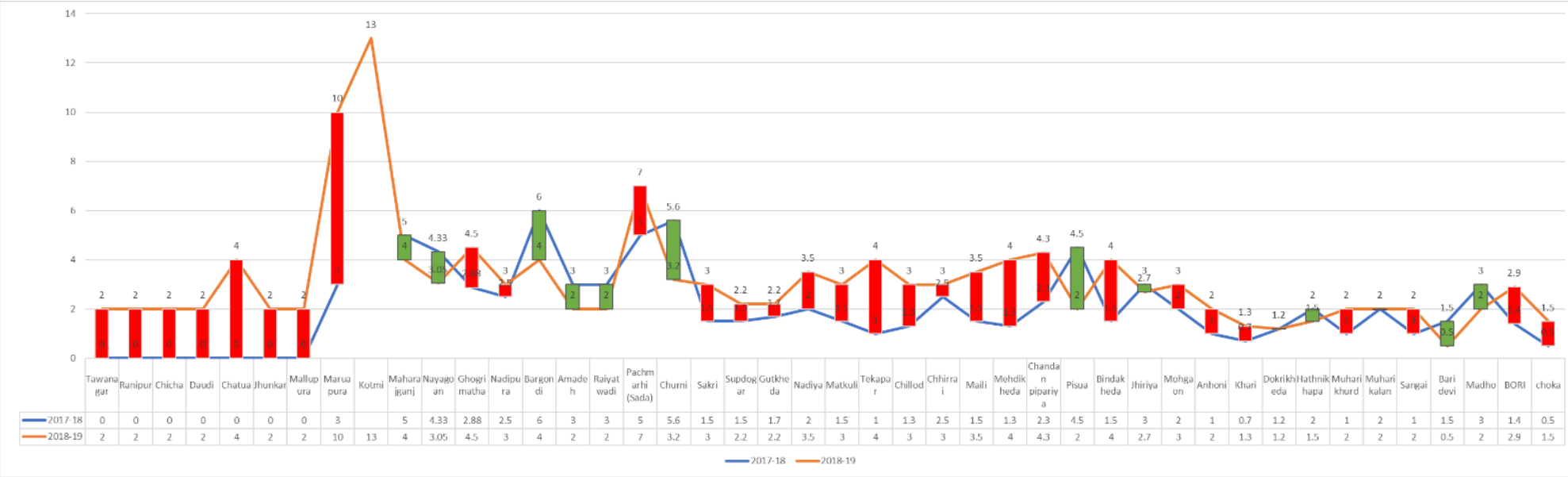


Figure 3- 21 : Ground water scenario in STR

Ground water Recharge Techniques

Table 3- 13: Ground water recharge techniques and suitability for STR

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/ Masonry Dams	1. 1. Relatively inexpensive and easy to construct. 2. Reduces sedimentation. 3. Can be more easily used higher in the watershed.	1. Moderate maintenance needed. 2. Check dams are only suitable for a limited drainage area. 3. Reduce the hydraulic capacity of the channel.	Yes

Sr. No.	Technique	Pros	Cons	Suitability (Yes/ No)
		4. Reduce velocity and may provide aeration of the water.		
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.

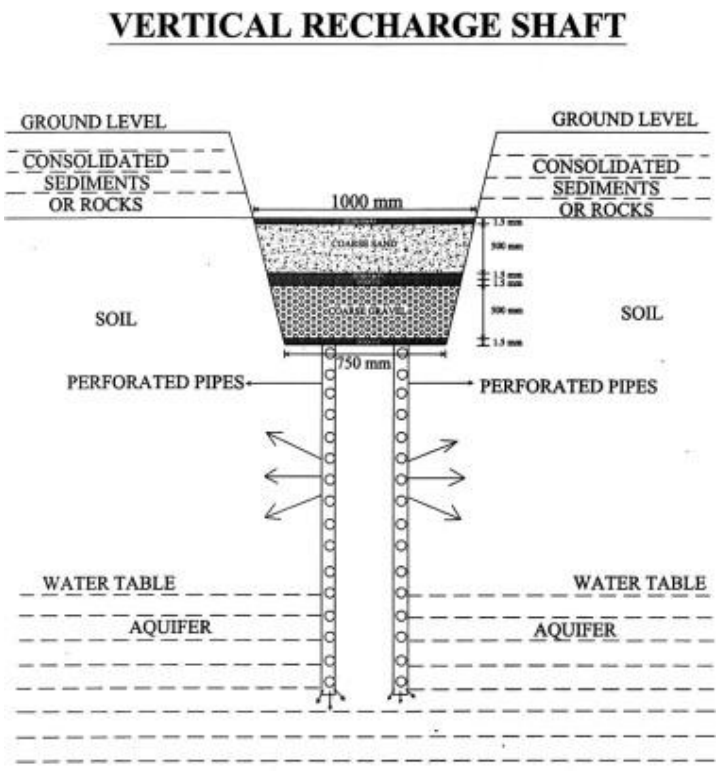


Figure 3- 22 : Thematic diagram of recharge shaft

Percolation tank with pit shaft or well

Percolation tanks are widely used in India to recharge groundwater, particularly in alluvial and hard rock formations. They are most effective in hard rock areas, especially where the rocks are fractured and weathered. States like Maharashtra, Andhra Pradesh, Madhya Pradesh, Karnataka, and Gujarat have constructed many percolation tanks in basaltic and crystalline rocks, with significant success in the Satpura Mountain front of Maharashtra. These tanks are also effective in mountain fronts with talus scree deposits and the Bhabar zone. Modified designs, including wells and shafts, are used to recharge deeper aquifers where shallow formations are impermeable or claye.

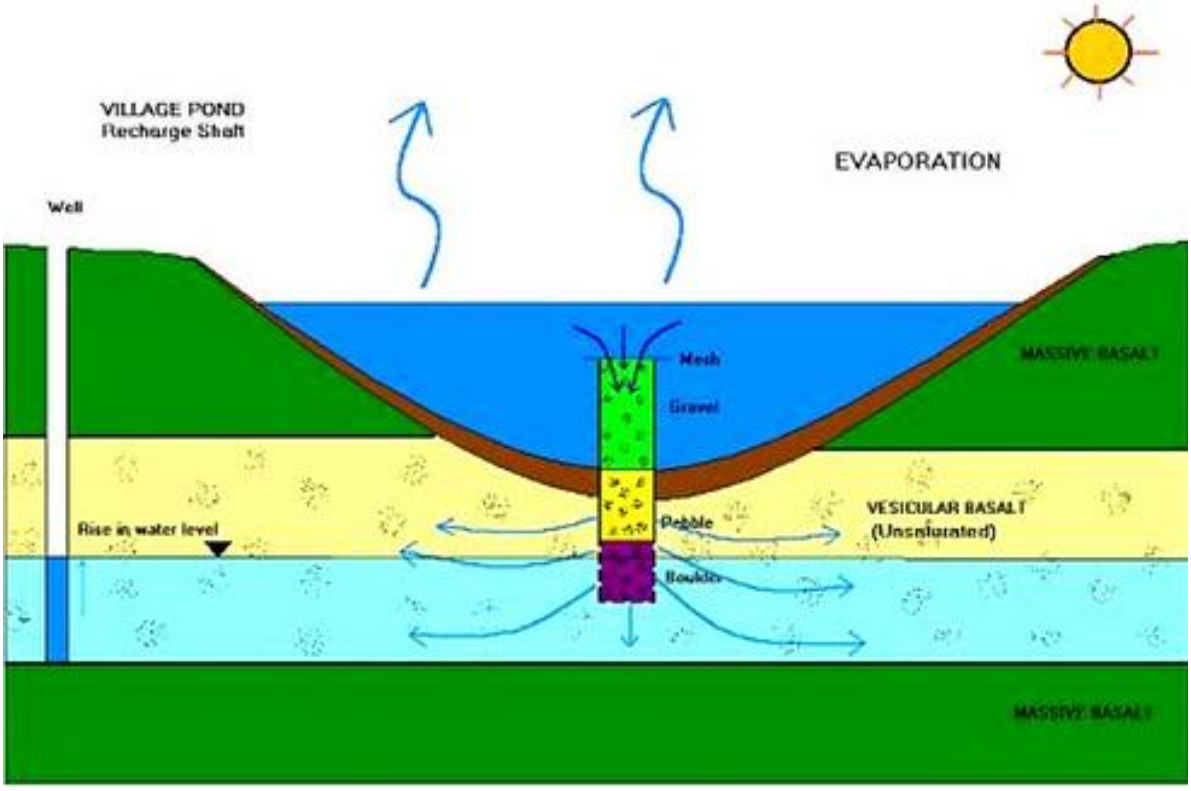


Figure 3- 23 : Thematic diagram for percolation tank with recharge shaft or well

Check dams/ Masonry Dams

Check dams are constructed across small streams having gentle slope and are feasible both in hard rock as well as alluvial formation. The site selected for check dam should have sufficient thickness of permeable bed or weathered formation to facilitate recharge of stored water within short span of time. The water stored in these structures is mostly confined to stream course and the height is normally less than 2 m. These are designed based on stream width and excess water is allowed to flow over the wall. In order to avoid scouring from excess run off, water cushions are provided at down streamside. To harness the maximum run off in the stream, series of such check dams can be constructed to have recharge on regional scale.

Figure 3- 24 : 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.

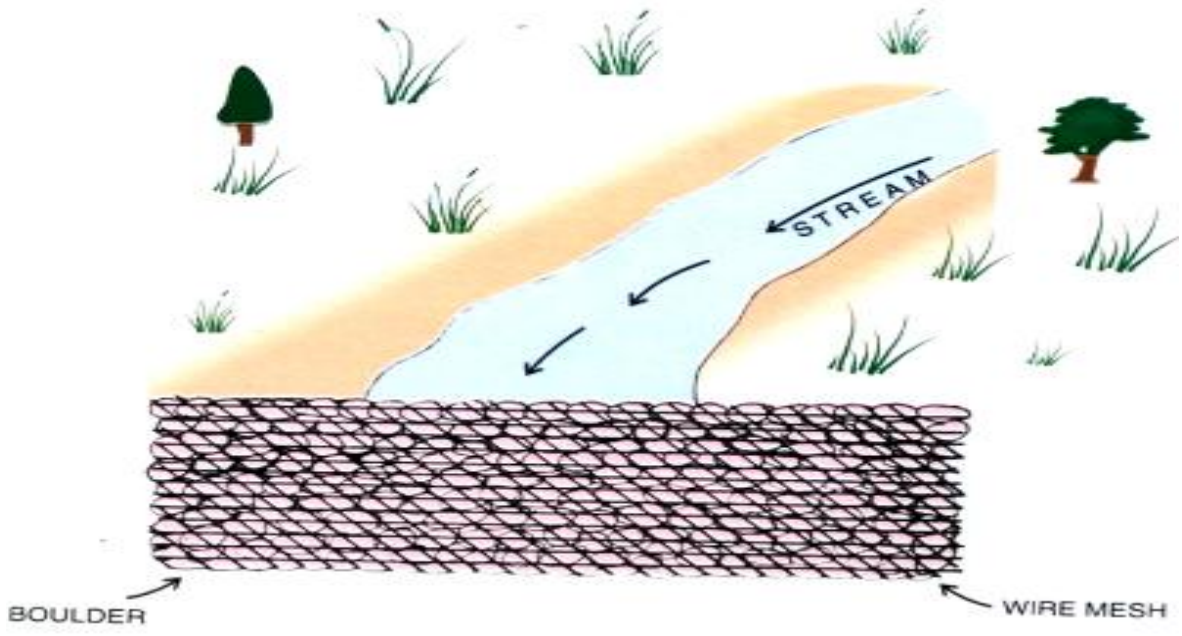


Figure 3- 25 : Thematic diagram for Boulder on streams

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 (fig 5). 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.

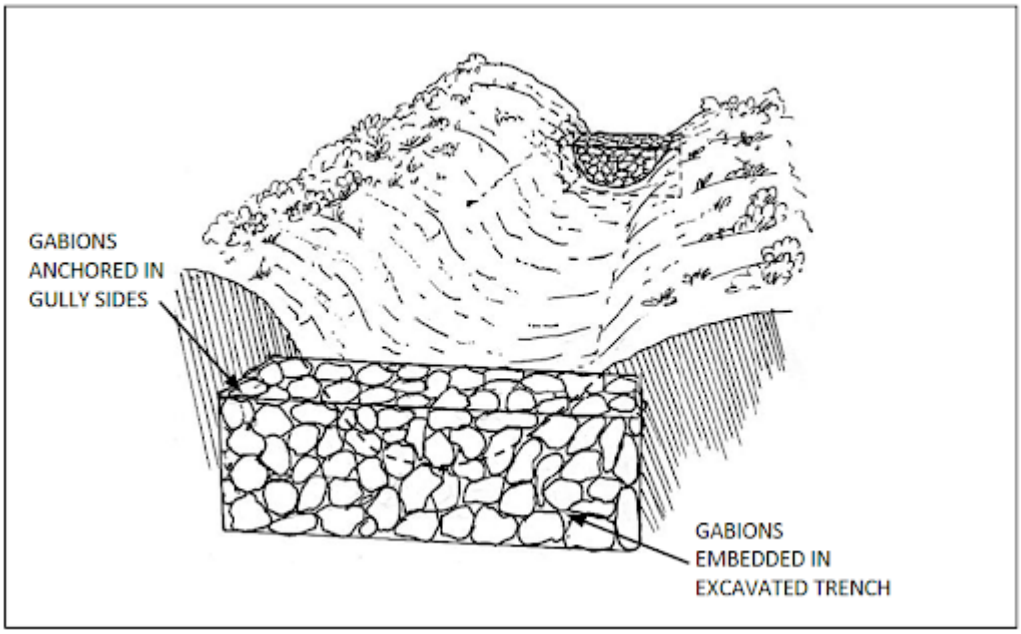


Figure 3- 26 : Gabion structure on water bodies

Feasibility study and hydrological study should be carried out before implementation of the technique for ground water recharge.

For the conservation ground water recharge in the ESZ region a map is prepared showing the identified suggestive location for check dams and Percolation tank. Refer.Fig-11.57

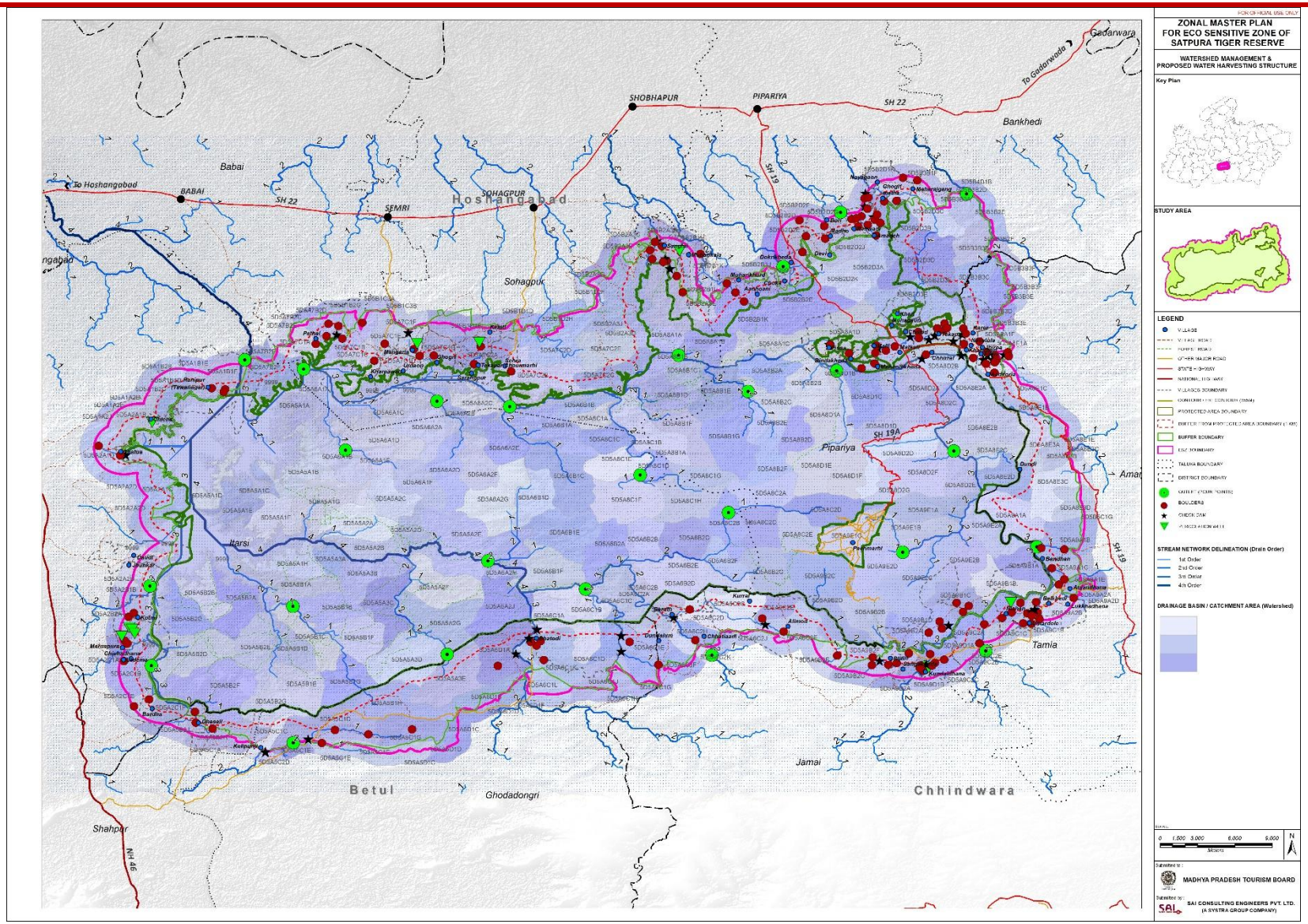


Figure 3- 27: Watershed Management

1.2.3.11 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 STR 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.

1.2.3.11.1 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.

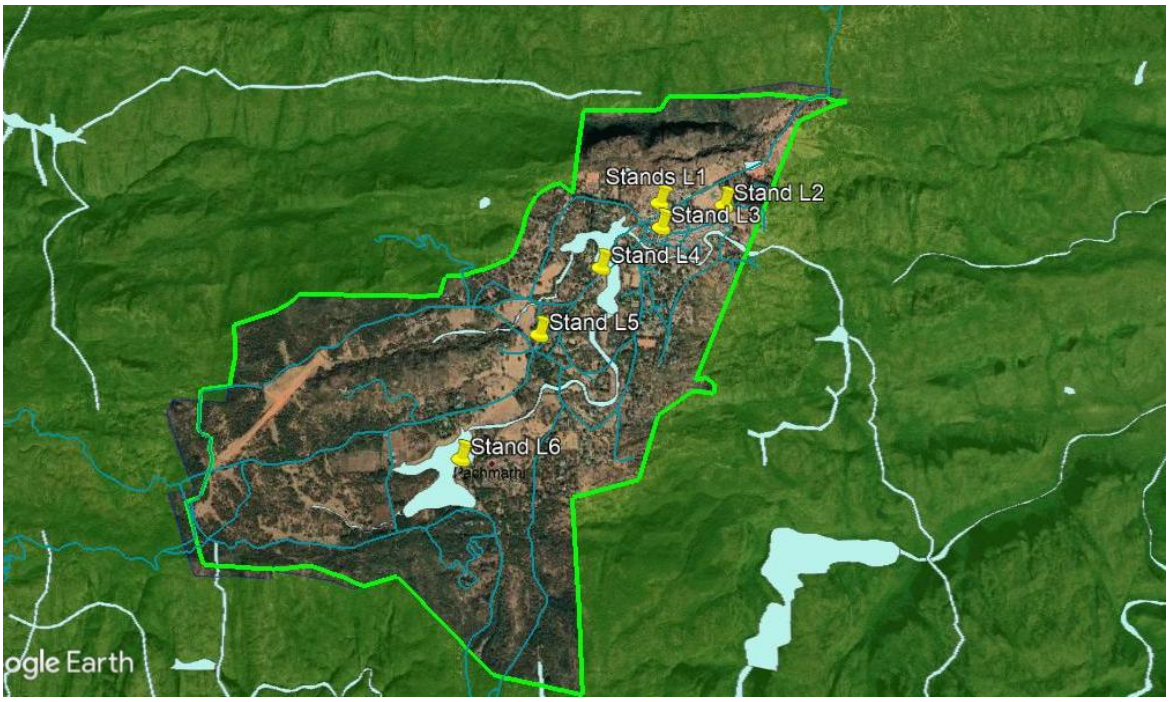


Figure 3- 28 : E-Bike and Cycle stand suggestive location in Pachmarhi

Pachmarhi is the tourist attraction of Satpura Tiger Reserve. Because of its natural beauty, thousands of tourists visit the place in a year. Pachmarhi also organizes Pachmarhi Festival in December, which also attracts the tourist to stay and spent time in Pachmarhi.

E-bikes and Cycle on rent is proposed in area as there is very less internal mobility options are available to explore Pachmarhi. These bikes and cycles can be helpful for tourist for movement in Pachmarhi. Six suggestive locations based on the area, distance and locations in pachmarhi, proposed as E bike and Cycle stand as below Table. These bikes and cycles are for only limited to Pachmarhi only because of the terrain and core jungle area in surrounding area.

Table 3- 14: E-Bike and Cycle stand location in Pachmarhi

Sr No.	Suggestive Location	Nearby Landmark
1	Stand L1	Pachmarhi Bus-Stand
2	Stand L2	Kendriya Vidhyalay
3	Stand L3	Hotel Pachmarhi
4	Stand L4	SBI Bank, Mahadeo Road
5	Stand L5	Jaistambh Chowk
6	Stand L6	Pachmarhi Adventure Club, Boat Lake.

Figure 3- 29 : Photos for animal passage Canopy structure, Box culvert, Pipe culvert structure in forest area

1.2.3.11.2 Electric Vehicles for Safari

Electric Vehicles for Safari should be promoted.

Figure 3- 30 : E-vehicles in Safari

1.2.3.11.3 Solar Energy

Promoting non-conventional energy sources like solar power in the Satpura Tiger Reserve (STR) can protect wildlife and forest cover. Conventional power lines disrupt wildlife habitats and may cause accidents. Solar energy, however, offers an alternative for villages, benefiting agriculture and domestic use. While year-round electricity may not be feasible due to atmospheric conditions, solar power can be produced regionally or in clusters.

Solar energy is a reliable and flexible alternative. Unlike other energy sources, solar power can be customized and installed with minimal land and infrastructure requirements. It can be used for water

pumps, irrigation, street lighting, and small businesses. For new resorts, solar heaters and panels should be mandatory, and existing resorts can be encouraged through subsidies.
Many case studies across India highlight the positive impact of solar energy in rural areas, supporting both environmental and economic sustainability.

Additionally, Madhya Pradesh offers government schemes for promoting and financially supporting solar energy initiatives. Some schemes are The KUSUM Scheme, India, NABARD – MNRE Scheme etc.

1.2.3.11.4 Biogas

To convert waste into energy, biogas plants can be set up at the community or individual level in rural areas of STR. These plants would use organic waste from villagers and livestock to generate gas for domestic use, reducing reliance on firewood from forests. Most villages in the ESZ are tribal and remote, with residents depending on firewood for cooking. This practice causes health issues, particularly for women, due to smoke and CO2 emissions.

Biogas, made from cow dung and organic waste, offers a cleaner, eco-friendly, and cost-effective alternative. Many rural areas in India have seen successful household and community biogas plants, improving economic conditions, health, and the environment. Biogas provides smokeless cooking fuel and produces organic fertilizer, reducing the need for costly chemical fertilizers. Additionally, biogas helps cut methane emissions, which are harmful greenhouse gases released when farmyard manure is stored.

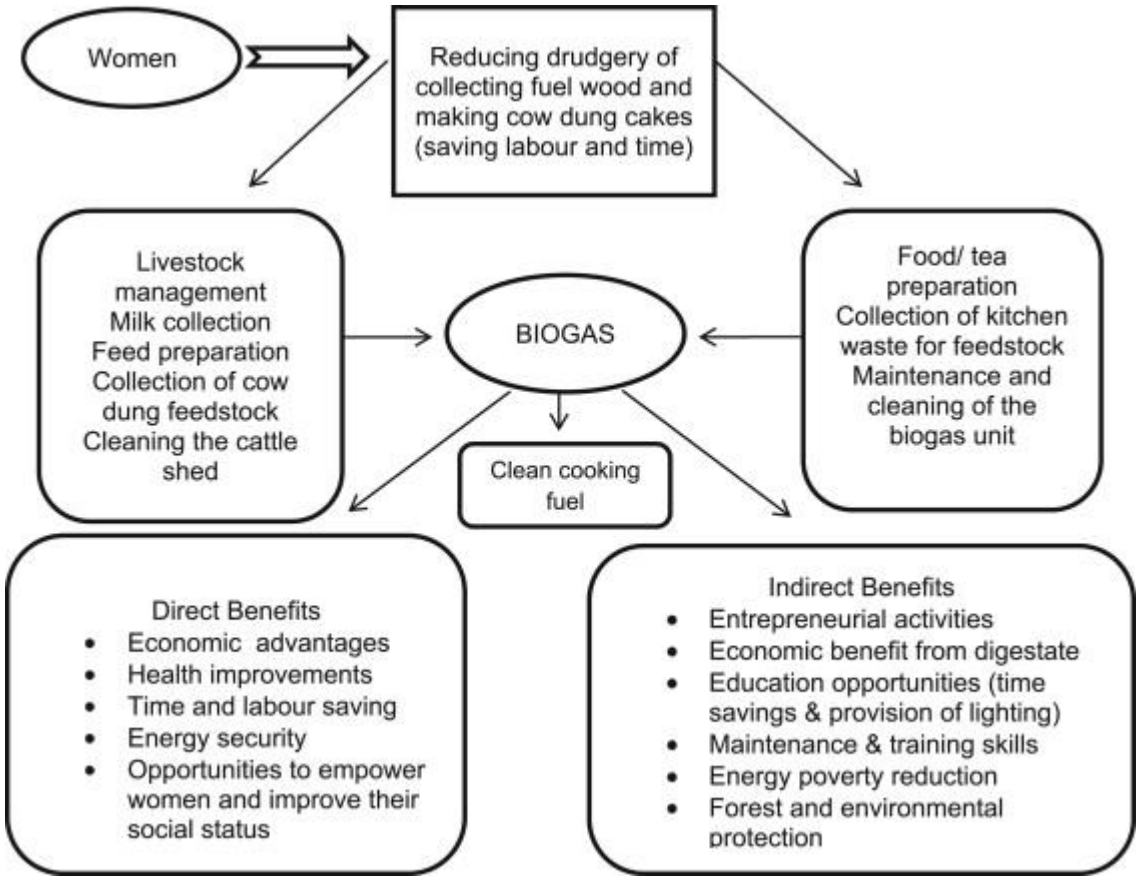


Figure 3- 31 : Promotion of Biogas

Government Initiatives for promotion of Biogas:

1. **Gobar Dhan Yojna:**

- Galvanizing Organic Bio-Argo 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:
    - To harness Bio-waste to generate bioenergy in the form of Biogas available in the villages
    - 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 based on 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 co-operatives, individual farmers / organisations and community.
- Back-ended capital subsidy is provided for setting up biogas plants.

3. National Biogas and Manure Management Programme (NBMMP)[6]

- 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 Northeastern Region (NER) States and ` 8,000 to ` 10,000 per plant for other States.

1.2.3.11.5 Conservation of Night Sky

People all over the world are living under the night-time glow of artificial light, and it is causing big problems for humans, wildlife, and the environment. Light pollution adversely affects professional and amateur astronomers, as well as casual observers of the night sky, because it severely reduces the visibility of stars and other celestial objects. The reduction in night sky visibility is a result of “skyglow,” upward-directed light emanating from poorly designed or directed lamps and security floodlights. This wasted light is scattered and reflected by solid or liquid particles in the atmosphere and then returned to the eyes of people on the ground, obliterating their view of the night sky. The effect of skyglow from a town or city is not necessarily localized; it can be observed far from the main source.

To tackle the light pollution issue related to night sky, International Dark sky Association (IDA) has proposed to have a dark sky reserve, classifying in categories by type of area like dark sky parks, dark sky reserves, dark sky sanctuaries and urban night sky places. IDA has designated 133 International Dark Sky

[6]https://cag.gov.in/sites/default/files/audit_report_files/Union_Civil_Performance_Renewable_Energy_Report_34_2015_chap_8.pdf

Places, protecting nearly 100,000 sq km of dark places around the globe. An IDA International Dark Sky Reserve is a public or private land possessing an exceptional or distinguished quality of starry nights and nocturnal environment that is specifically protected for its scientific, natural, educational, cultural, heritage and/or public enjoyment. Reserves consist of a protected area meeting minimum criteria for sky quality and natural darkness, and a peripheral area that supports dark sky preservation in the protected area. Reserves are formed through a partnership of multiple land managers who have recognized the value of the natural night-time environment through regulations and long-term planning. IDA focuses on four strategic priorities of Celebrate the night, Dark Sky Protection, Lighting Where We Live and Sky shed Restoration.

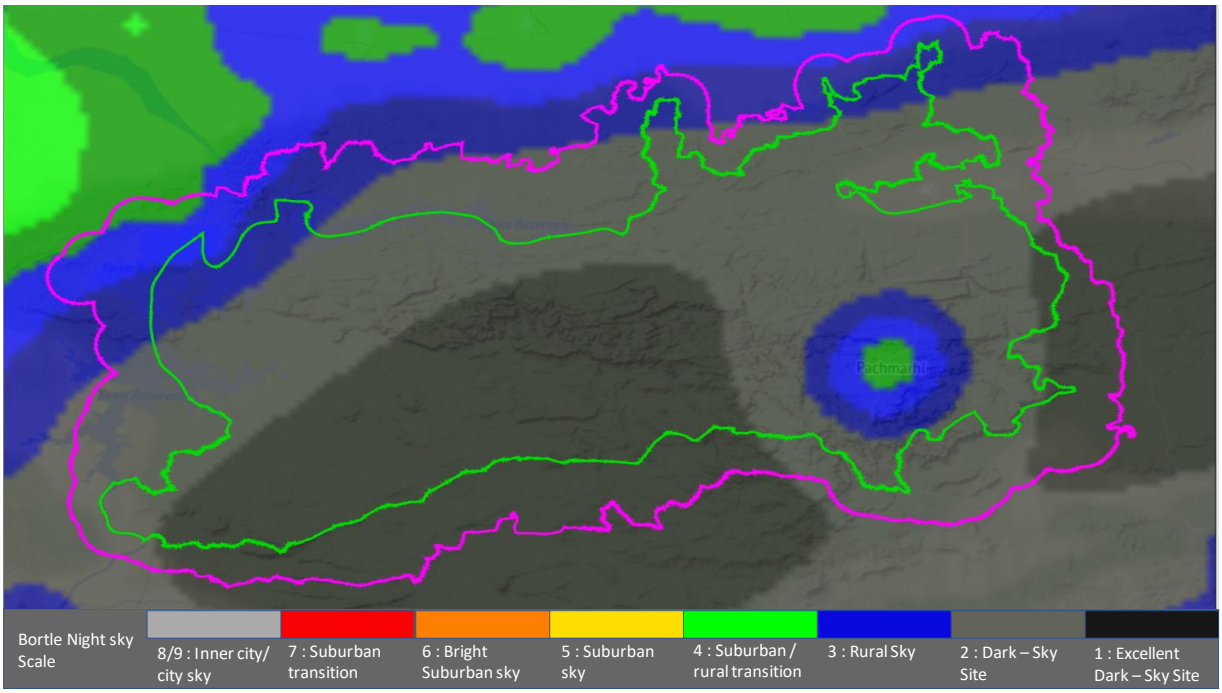


Figure 3- 32 : Dark sky analysis with Bortle sky scale

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

The analysis for the night sky can be represented with Bortle night sky scale, which indicates the quality and suitability of the dark night sky. As shown in figure above, Satpura Tiger Reserve has the 2nd scale in most of the area, which is suitable for dark sky site. Some of the area of southern and eastern STR can be suitable for Dark sky site as the area has scale -1 sky available. By having presence of cities and towns in north, scale-3 rural sky with minimum lighting is there. Pachmarhi, having large population has the bright sky even in night. From the analysis, It is suggested that STR can apply for designation of dark sky reserve, which has eligibility criteria of Must be a public or a private land of at least 700 km², accessible to the public in part or whole, that is legally protected for scientific, natural, educational, cultural, heritage and/or public enjoyment purposes. The protected area must provide an exceptional dark sky resource, relative to the communities and cities that surround it, where the night sky brightness is routinely equal to or darker than 20 magnitudes per square arc second.

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

1.2.3.11.6 Measures for pollution control

Satpura Tiger Reserve area has the approximate 70% of area is covered with forest. These dense forest of Satpura, helps to eliminate the pollution in region and freshens the air. But Pachmarhi is the popular tourism destination and approximate, 3 lakh people visit in a year. The melas of Nagdwari and Mahadeo, located in protected area. This tourism destination increases bio pressure on forest of STR.

Establishing PUC Centre

Monitoring for air pollution is limited to only Pachmarhi and Tawanagar. Tawanagar does not have regular monitoring for air pollution.

As the tourism sites are proposed in all over STR, vehicular movements will be increased and so does the air pollution. Because of that air monitoring is necessary for forest and to control the pollutants in area. By considering the carrying capacity and tourist footfall, total 7 numbers of PUC Centre are proposed to monitoring air pollutants in Eco-Sensitive Zone.

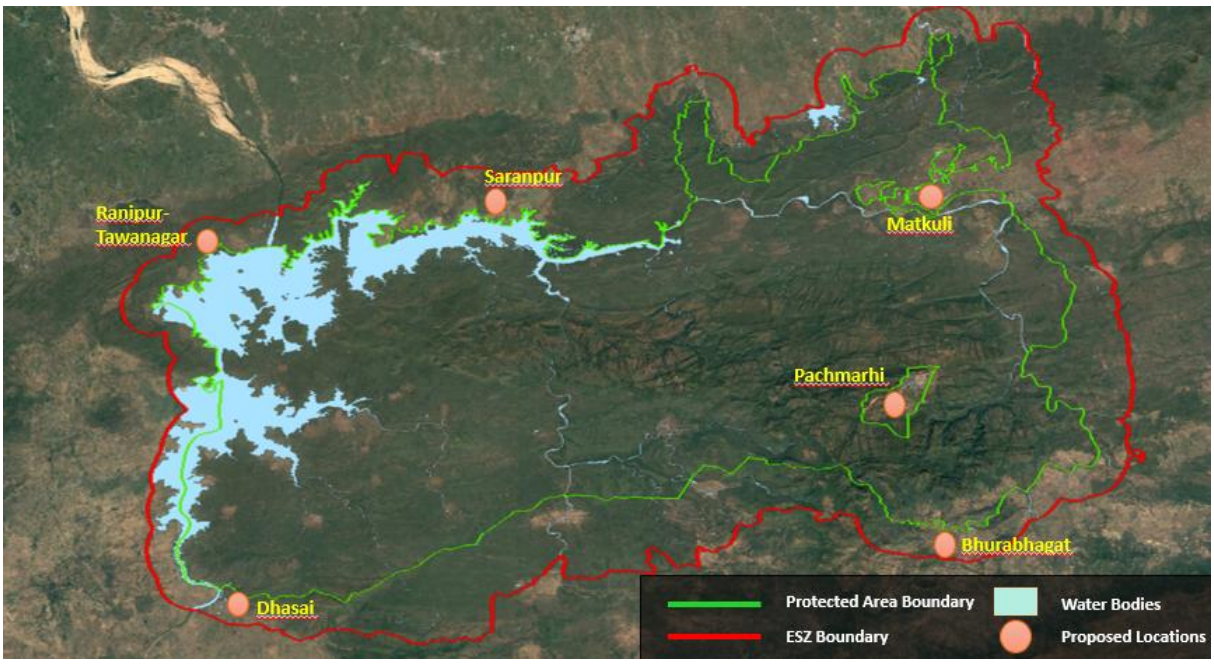


Figure 3- 33: Proposed air pollution measurement stations

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

Measures for water pollution

The sample for water pollution measurements collected with random sites for non-regular time intervals. The suggestion for regular at least in 1 year before and after rainfall sample should be collected and analyzed for waterfall sites with pools, rivers nearby area of settlements 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 area of Satpura Tiger Reserve to preserve the animal habitat and movement in protected area and buffer zone.

Apart from that, the proposal for noise observatory and measurement centers is proposed in areas of Ranipur-Tawanagar, Sarangpur, Bargondi, Matkuli, Bhurabhagat and Bardha-Dhasai. These areas fall in Reserve or Protected forests and proposed as tourist centric destinations. The establishment and management of these centers to be done by MPPCB and monthly data to be share with STR for management and conservation purpose.

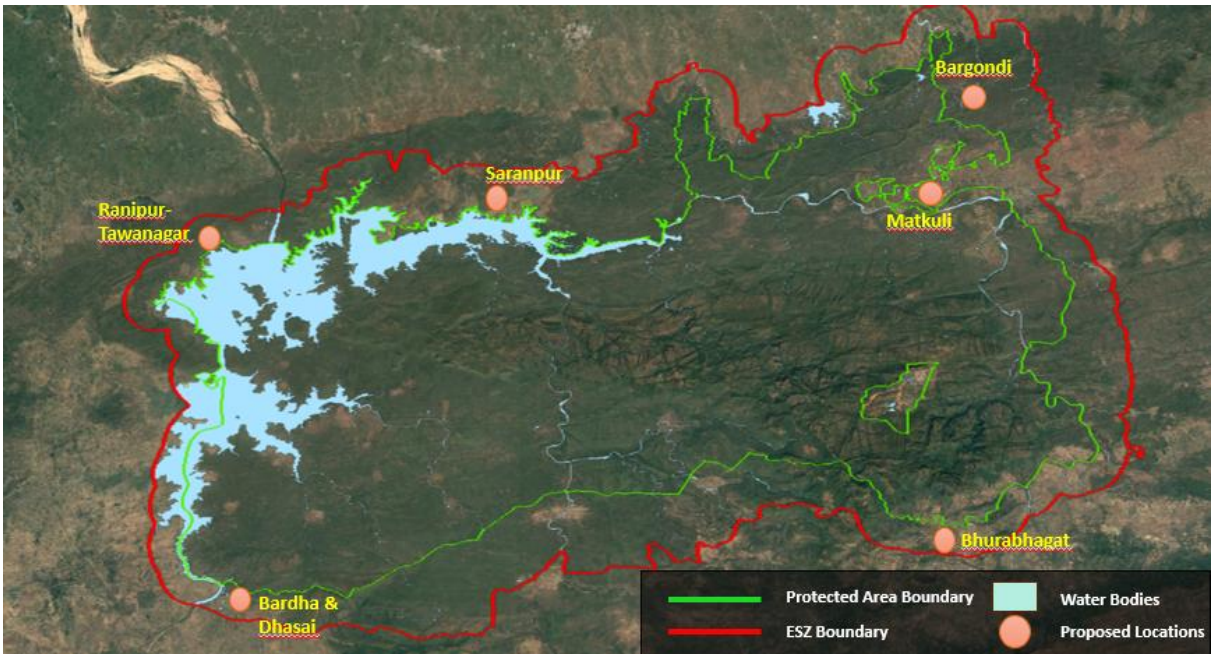


Figure 3- 34 : Proposed noise measurement stations

To regulate the noise, a tree cover buffer or other suitable noise barriers is suggested to provide at building unit level or at cluster level.

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	Visiting Date
1	Tekapar	01/07/2016
2	Ghoghari	01/07/2016
3	Urdon	01/07/2016
4	Ranipur	30/06/2019
5	Naya Chicha	30/06/2019
6	Chatua	30/06/2019
7	Jhunkar	30/06/2019
8	Tawanagar	30/06/2019
9	Daudi	30/06/2019
10	Magariya	02/07/2019
11	Dokrikhera	04/07/2019
12	Tekapar	25/07/2019
13	Jhirpa	25/07/2019
14	Jhunkar, Daudi	25/07/2019
15	Bardha	25/07/2019
16	Silwani	25/07/2019
17	Pipariya Kalan	25/07/2019
18	Kelipunji	26/07/2019
19	Dhasai	26/07/2019
20	Bori	27/07/2019
21	Devi	27/07/2019
22	Madho	27/07/2019
23	Raitwadi	27/07/2019
24	Amadeh	27/07/2019
25	Matkuli	28/07/2019
26	Ghoghri Mattha	28/07/2019
27	Mohgaon	28/07/2019

Sr. No	Villages	Visiting Date
28	Khari	28/07/2019
29	Khanchari	28/07/2019
30	Fiferi	28/07/2019
31	Muharikala	29/07/2019
32	Delakheri	29/07/2019
33	Kapurnala	29/07/2019
34	Nishan	29/07/2019
35	Nayagaon	29/07/2019
36	Sangi	29/07/2019
37	Sarangpur	29/07/2019
38	Sehra	30/07/2019
39	Tekahar Chourmahi	30/07/2019
40	Sehra	30/07/2019
41	Bijakheri	30/07/2019
42	Gram Panchayat, Jamundonga	03/08/2019
43	Anjandhana	03/08/2019
44	Almod	03/08/2019
45	Sangakheda	03/08/2019
46	Bandhan	04/08/2019
47	Belkhedi	04/08/2019
48	Bijori	04/08/2019
49	Umardole	04/08/2019
50	Karer	05/08/2019
51	Pachmarhi	05/08/2019

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 Satpura Tiger Reserve i.e., Agriculture, Tasar Farming, Forest, Animal husbandry & Tourism. Agriculture is predominantly major part of rural economy in India. For Satpura 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, in addition, the only hill station of Madhya Pradesh State- Pachmarhi is a major tourist attraction point throughout the year. Animal Husbandry is also one of the important components of rural economy.

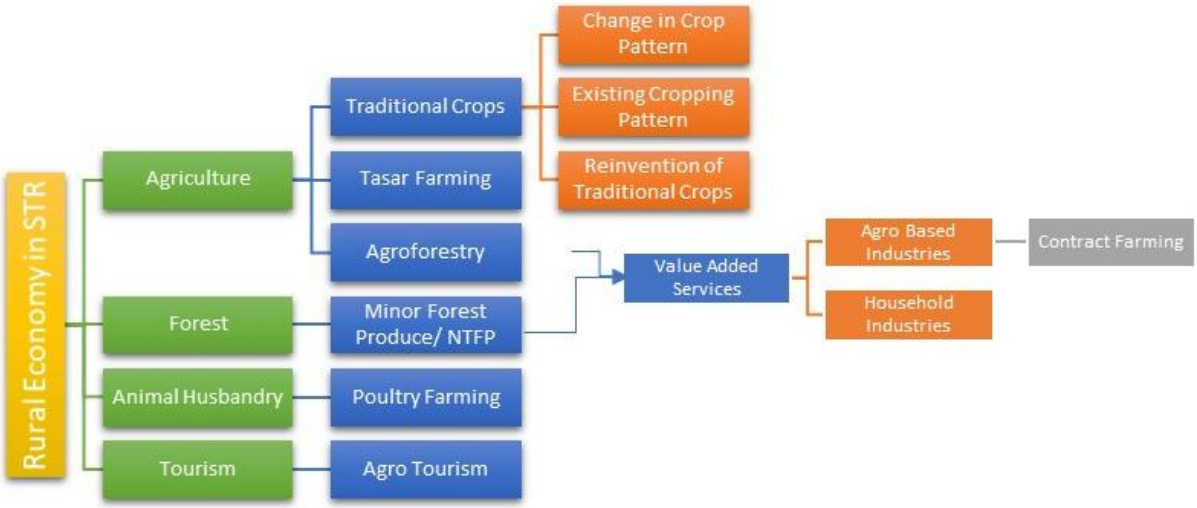


Figure 4- 1 : Strengthening Economy of The Villages

1.2.4.3 Promotion of Eco-Development Activities

Agriculture, with its allied sectors, is unquestionably the largest livelihood provider in India, more so in the vast rural areas. It also contributes a significant figure to the Gross Domestic Product (GDP). Sustainable agriculture, in terms of food security, rural employment, and environmentally sustainable technologies such as soil conservation, sustainable natural resource management and biodiversity protection, are essential for holistic rural development.

Traversed by the sacred Narmada river and its tributaries, Satpura tiger reserve represents rich agricultural land. The soil type of the STR is Shallow black soil and deep black soil. The STR falls into Satpura plateau and in some parts of Central Narmada Valley. Therefore, due to the soil type currently the majorly grown crops in this region are Wheat, makka and soybean . Traditionally kodo and Kutki millets were major agriculture produce in villages of Eco Sensitive Zone of Satpura tiger reserve. Basically, Kodo and kutki millets are traditional crops of Gond and Baiga tribes residing in villages of ESZ of STR.

1.2.4.3.1 Traditional Crops

A traditional crop is an indigenous species native to a specific region or one that was introduced a long time ago and, due to long use, has naturalized and become part of the culture of a community. Numerous mountain communities have long depended on slash-and-burn agriculture and hunting and gathering as their principal means of securing a livelihood, particularly in tropical areas. To reduce the vulnerability of mountain communities, traditional ecological knowledge is increasingly adopted and recognized as a key mechanism to enhancing ecological sustainability through localized practices, such as traditional farming. Traditional farming in mountain communities has also supports the cultural and biological diversity that is also 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.

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".

Concept of organic farming:

Organic farming endorses the concept that the soil, plant, animals and human beings are linked. Therefore, its goal is to create an integrated, environmentally sound, safe and economically sustainable agriculture production system.

A key feature of organic farming is the primary dependence on natural resource and those developed locally (green manures, crop residues, farm wastes etc.), rather than external inputs. The farmer manages self-regulating ecological and biological processes for sustainable and economic production of products.

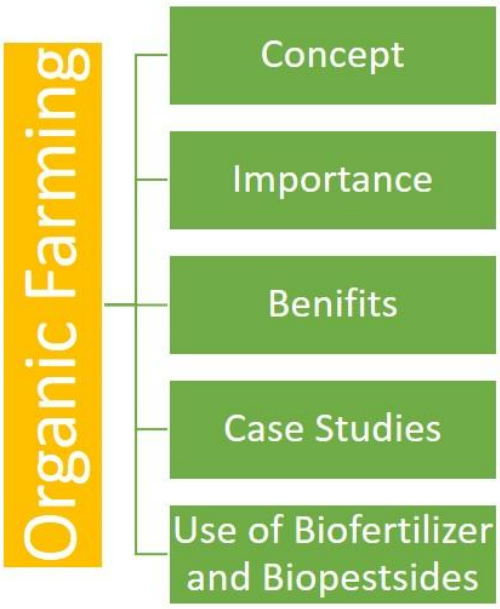


Figure 4- 2 : Organic Farming

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.

Promotion of Biofertilizer and Biopesticides in Organic Farming- Points

One of the major drawbacks of organic farming is due to absence of pesticides, insects attacks on organic agriculture crops and destroy it that results in low production of organic crops. As a solution for that use of biofertilizer and biopesticides should be used and is already promoted by the government.

Government Schemes for Agriculture sector:

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
- Under NABARD)
- Rashtriya Gokul Mission
- 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
- 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:

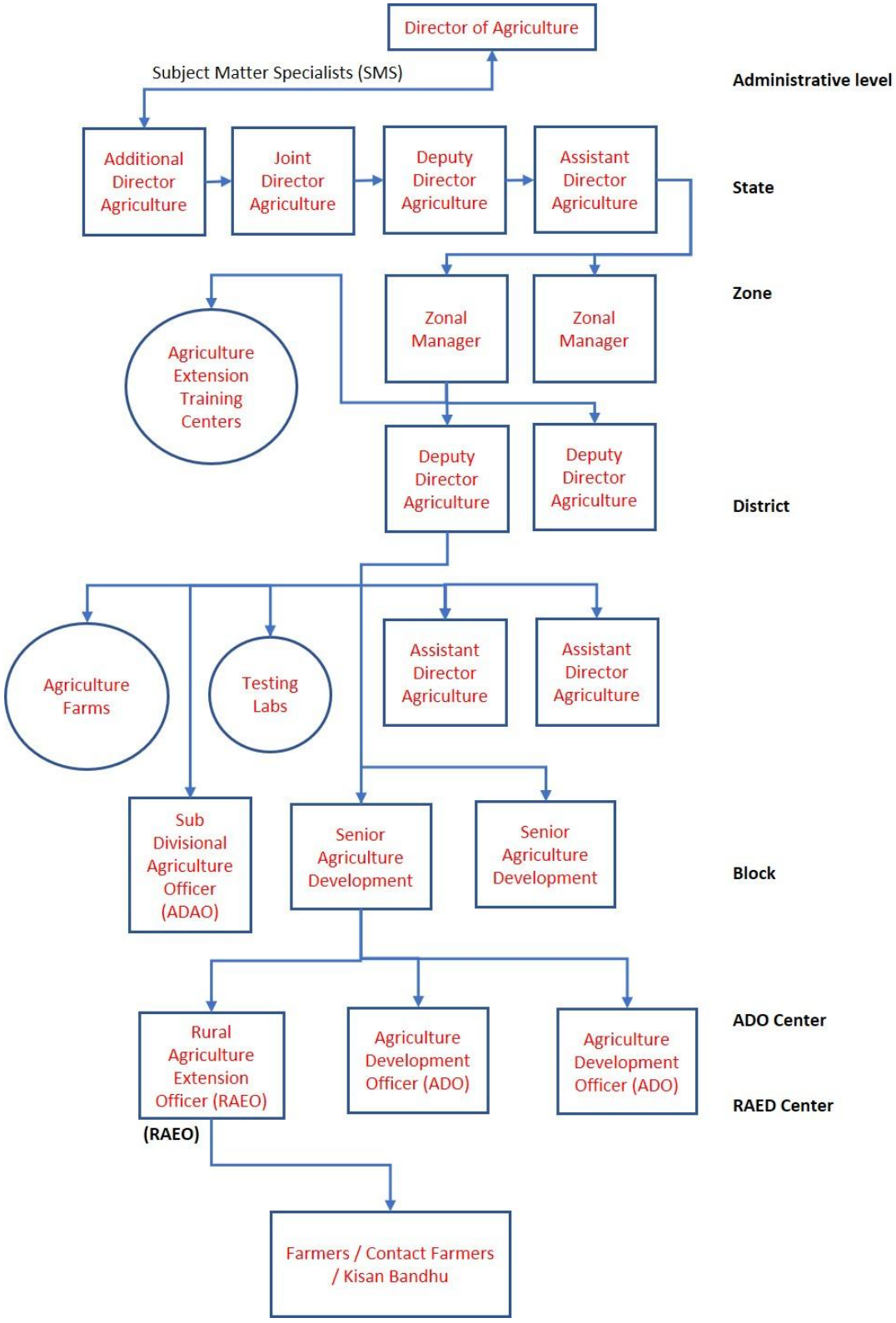


Figure 4- 3 : Existing structure of Department of Agriculture and tribal welfare is shown

Nishan cluster is situated on the bank of Denwa river and have many natural streams passing through this cluster and merging in Denwa river. Entire village is dependent on agricultural activities. In order to

promote organic agriculture, Nishan is one of the best suitable locations & can immerge as model village for organic farming for the region. Also, due to the natural scenery and landscape view of Satpura Hills from the village, can attract tourists in the area & can promote agro tourism in the area that can even generate side income for the villagers. Stay in this village will create an unforgettable experience for tourists. Nishan has more than 90% tribal population in the village & as discussed in 1.1.2, Kodo and Kutki millets are traditional crops of tribal community of STR. So, promotion of Kodo and Kutki Millets can also be done through Nishan Cluster. Various food products can be served to the tourists made from Kodo and Kutki millets that will enhance their experience. Also, nearest haat bazar is in Sangakheda which is approximately 18 km from Nishan. It is one of the largest haat bazar in STR region. A warehouse has also been proposed in Sangakheda to store the agricultural products. People from Chhindwara and other urban areas, come to this haat bazaar for trading of crops and other products. For promotion of organic crops one information center should be developed in Nishan Cluster which will spread awareness regarding organic agriculture practice and will train and guide farmers towards organic agriculture farming.

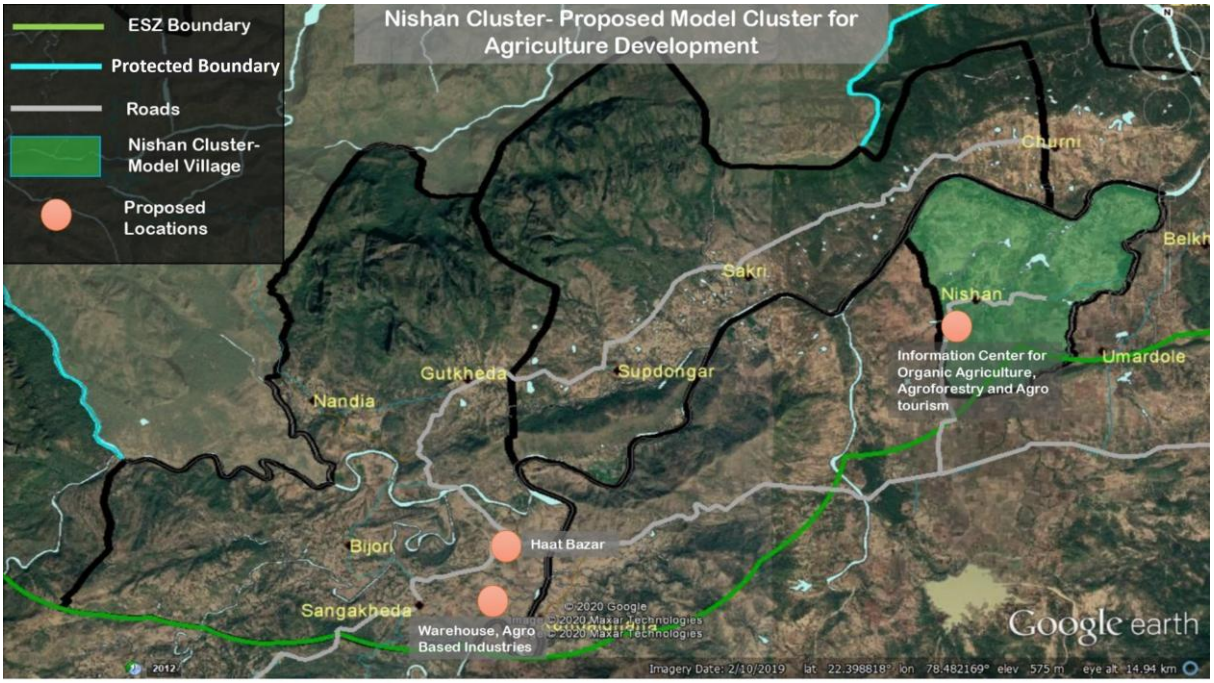


Figure 4- 4 : Nishan Cluster-Proposed Model Cluster for Agriculture Development

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

1.2.4.3.2 Tasar Development

In ESZ of Satpura Tiger Reserve, there are mainly three villages performing tasar farming and mulberry sericulture activities. i.e., Dokrikheda, Chhirrai and Matkuli. Matkuli and Chhirrai villages are facilitated with reelling center in the region. Promotion of Taser farming and mulberry sericulture can be promoted in this area and more reeling centres can be developed in the region that will create employment for villagers. Madhya Pradesh Silk Federation (MPSF) have already established training programs and schemes for promotion of tsar farming and mulberry farming.

SILKS (Sericulture Information Linkages and Knowledge System) has carried out a feasibility study for the potential areas of Mulberry and Tasar farming in Madhya Pradesh. For assessing the suitability of Mulberry and Tasar farming, SILKS has considered various parameters such as soil type, slope, connectivity, etc. The areas of Dokrikheda, Choka, Madho, Bori, Raitwadi, Amadeh, Ghoghri Matha, and Maharajganj villages are considered moderately suitable and least suitable for Tasar and Mulberry farming. NGOs and other public private partnership can be involved to promotion of tsar farming in the area.

Table 4- 2: Village wise area suitability for Tasar farming and mulberry farming is shown

Sr.No	Cluster	Village	Suitability	Area Ha.
1	Madho	Amadeh mal	Moderate	300.41
			Low	2.63
		Bori	Moderate	136.08
			Low	27.36
		Devi	Moderate	113.44
			Low	9.88
		Ghoghri Mattha	Moderate	127.56
			Low	6.74
		Madho	Moderate	28.17
			Low	6.96
		Maharajganj	Moderate	44.86
			Low	112.16
		Nayagaon	Moderate	2.15
			Low	56.50
		Raitwadi	Moderate	129.23
			Low	15.12
		Total		**1119.24**
2	Dokrikheda	Aanhoni	Low	11.49
		Chauka	Moderate	41.31
		Dokrikheda	Moderate	107.44
		Total		**160.24**
3	Outside Cluster		Moderate	129.91
	Total			**1409.40**

Government Schemes for promotion of Sericulture

There are several government schemes are going on in the region. Some of them are:

- Tasar Sericulture Development and Extension Programme
  - 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.
- Mulberry Sericulture Development and Extension Programme
  - Landless agriculture labour is being provided with 1 acre of mulberry planted land at Govt. mulberry centres on usufruct right.
  - Rs.6200/- per beneficiary is provided for cultural operation as revolving fund.
- Integrated cluster development programme
  - Cluster development would be considered in the far-flung areas which are having low socio-economic profile.
  - Taped cluster would be affiliate with sericulture activities by providing facilities as per scheme directives.
- Assistance to Entrepreneurs/SHGs/NGO's
  - Schemes envisage public private partnership by involving SMEs/SMF/SHG/VOs/ beneficiaries.
  - Emphasis on design development, product development, product diversification and export-oriented products.
- Sericulture development

- To develop sericulture in the state, rural areas will be taped to enhance sericulture activities and beneficiaries.
- Sericulture employees would be trained by capacity building procurement of seeds on scientific line.

- Training and Research
  - Capacity building of beneficiaries and employees being undertaken in mulberry, tasar and eri sector for achieving national level parameters of productivity.
  - Research and development work including field trials and newly evolved high yield breeds of silkworm and food plants.

Directorate of Sericulture is the nodal agency for implementation and monitoring the schemes for promotion of sericulture in the region.

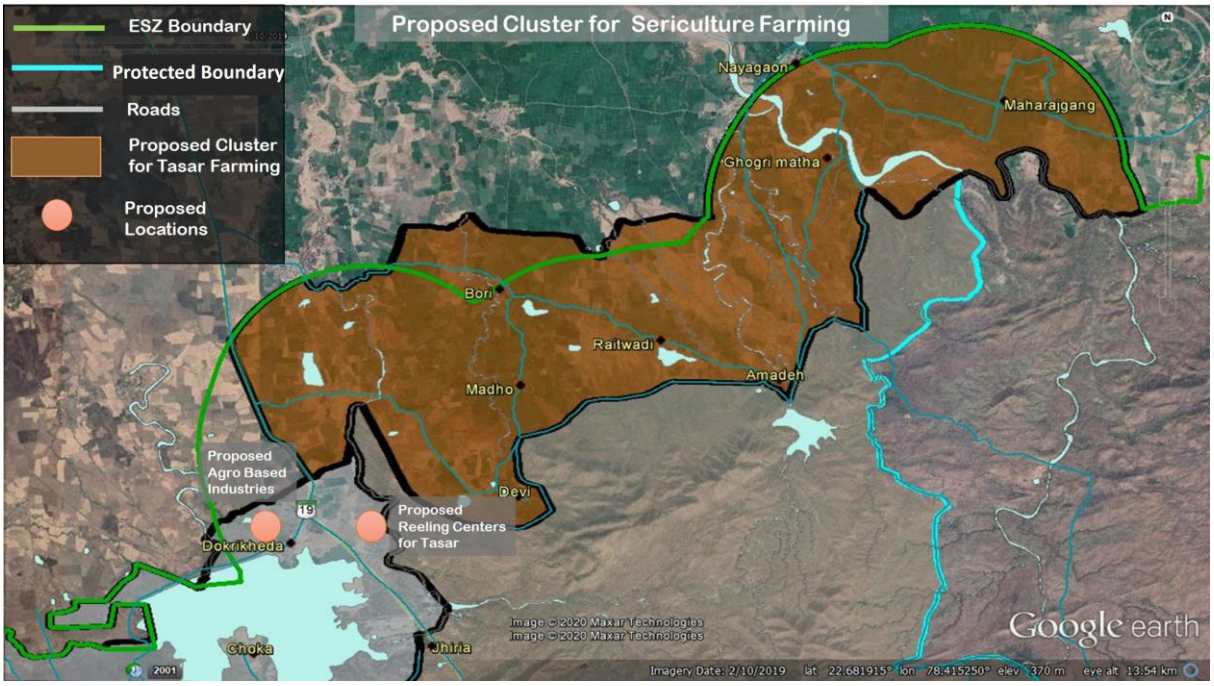


Figure 4- 5 : Suggestive Proposed area for promotion of Tasar farming and Mulberry farming

Based on study carried out by Sericulture Department, Madhya Pradesh, Organic Agriculture and Sericulture zone is proposed in a Madho Cluster as shown in map above. One reeling centre has also been proposed in this cluster to promote Tasar farming activity in the area. For processing of tasar silk, industrial zone has been proposed in Dokrikheda Cluster.

1.2.4.3.3 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.

One of the major issues with agriculture sector in the region is shrinking of landholding size for farmers, tree farming combined with agriculture is perhaps the only way forward to optimize the farm productivity and thus, enhancing livelihood opportunities of small farmers, landless and women.

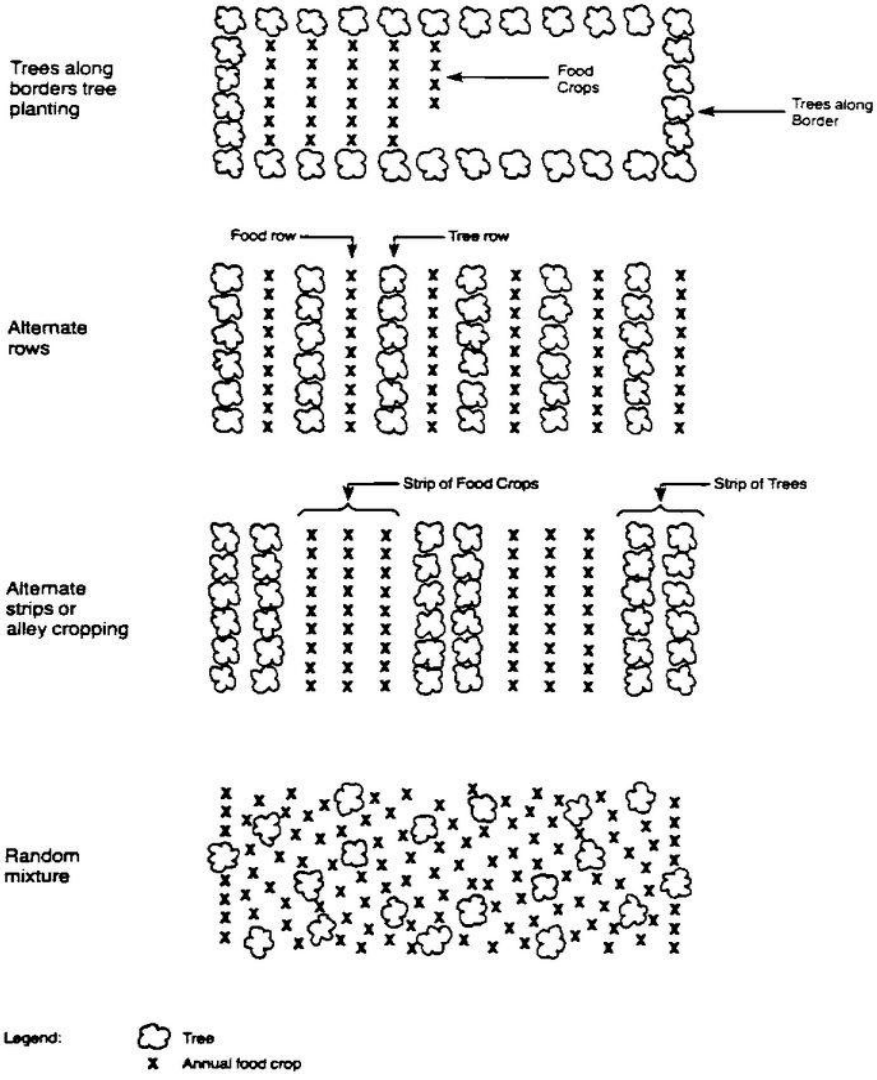
Social Benefits of Agroforestry:

Agroforestry can improve gender equality- Women Empowerment

Women make up a significant share, and in many cases, the majority, of both the agricultural and forest/tree labour force. Including trees in agricultural systems can help empower them. For example:

- When trees are more closely accessible, women, who are often responsible for the collecting of fuelwood or fodder, save precious time and energy.
- By selling fruits, fodder or fuelwood coming from the trees on the land, women can increase their access to cash.
- Because of women frequently have a more difficult access to resources, financial or other, agroforestry is a low-input solution to restoring soil fertility and increasing agricultural output.

Methods/ Systems of Agroforestry



(Image Source: Agroforestry In-service Training: A Training Aid for Asia & the Pacific Islands (Peace Corps, 1984))

Figure 4- 6 : Methods of Agroforestry

Some of the agroforestry methods or designs are border planting, alternate row planting, home agroforestry system etc. Each design and methods depend on type of crops and trees.

1.2.4.3.4 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 or eggs. According to the OECD-FAO Agricultural Outlook, India's poultry product demand will grow by 4.8% annually, with a 5.2% growth in poultry production. In rural areas, chickens are often of Desi breeds, which are low-producing in eggs and meat, contributing only 11% to India's total egg production. These breeds typically produce 50-60 eggs per year.

The Rural Backyard Poultry Development initiative, launched by the Indian government, supports Below Poverty Line (BPL) families by providing income and nutritional benefits. By 2013-14, about 40 crores were sanctioned for 1.66 lakh BPL beneficiaries, with a total of 6.13 lakh beneficiaries since 2009.

The All India Poultry Development Programme has led to a rise in commercial farms, making poultry farming a key part of the livestock sector. Government programs provide credit, subsidies, and technical assistance to small farmers and laborers, promoting poultry farming as a supplementary income source.

In the villages of the STR ESZ, backyard poultry farming could be another livelihood option. However, awareness is low, and self-help groups and NGOs can help address this gap.

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.

1.2.4.4 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.

TYPES OF AGRO-BASED INDUSTRIES

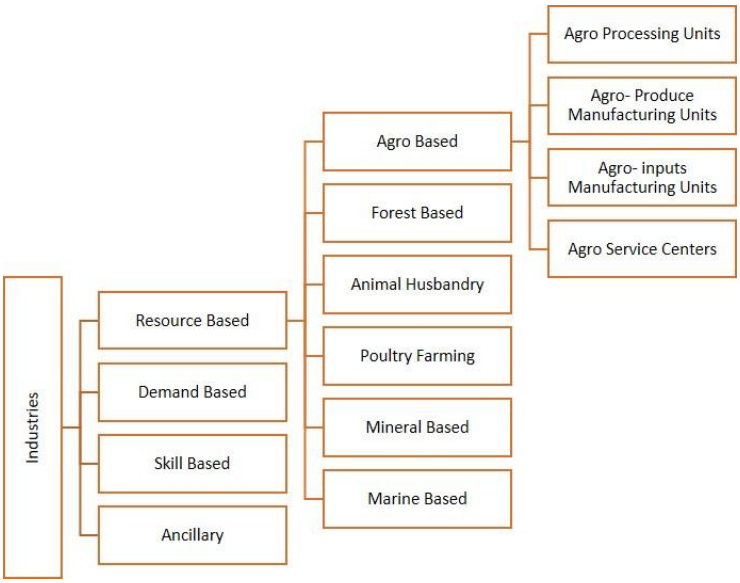


Figure 4- 7 : TYPES OF AGRO-BASED INDUSTRIES

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, pump set, 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.

1.2.4.4.1 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 parts of resource-based industries. Area of Eco Sensitive Zone of Satpura 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.

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 allocations (proportion based) may be provided for avenues of 'Secondary Agriculture' under DUSY, given the immense scope that exists for creating self-employment for rural population.

Nonetheless Agro-tourism plays an important role in promoting all the activities such as organic farming, traditional cropping, Tasar development, agro-forestry and agro industries. The agro tourism provides a direct platform for the villagers to showcase their produce and work to the local, national and foreign people visiting the region. Agro tourism provides an easiest way of promoting the various rural activities that is yet to be discovered by the youngsters of the urban areas. In this way it spreads awareness to both the visitors and the local people of the villages.

1.2.4.4.2 Agro Based Tourism

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

Figure 4- 8 : 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.

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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 tranquillity** - 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 tranquillity 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.

BASIC PRINCIPLES OF AGRO – TOURISM

Agro - Tourism should ensure the following three basic principles.

1. **Have something for visitors to see** - Animals, birds, farms and nature are few things which Agri-Tourism could offer to the tourist. Apart from these, culture, dress, festivals and rural games could

create enough interest among visitors in Agri-Tourism.

2. **Have something for visitors to do** - Participating in agricultural operations, swimming, bullock cart riding, camel riding, buffalo riding, cooking and participating in the rural games are few activities to quote in which tourists can take part and enjoy.
3. **Have something for visitors to buy -** Rural crafts, dress materials, farm gate fresh agriculture products, processed foods are the few items which tourist can buy as memento for remembrance. Madhya Pradesh Tourism Policy (2016) and Amendment (2019) also promotes and encourages farm tourism- Agri tourism as a part of rural tourism. Policy also promotes public private partnership for tourism sector.

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

1.2.5.1 Existing Tourism Facilities and Assets by MPTB

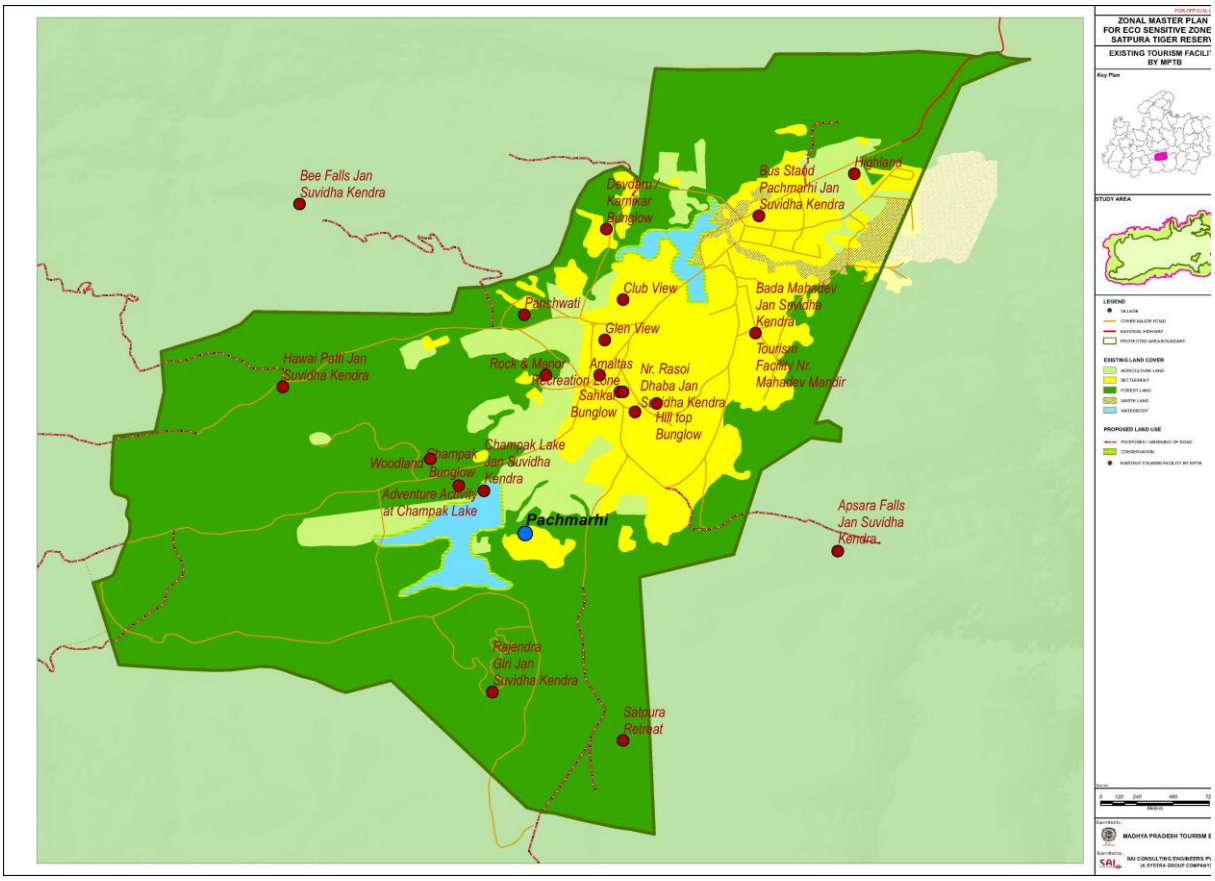


Figure 5- 1 : Existing Tourism Facilities

MPTB Assets		
S. No.	Survey No	Village
1	105	Urdon
2	1	Sarangpur
3	3	Sarangpur
4	81, 82/1, 82/2	Dokrikheda
5	95/1	Dokrikheda
6	7	Mohgaon
7	8	Mohgaon
8	11/3	Mohgaon
9	9	Chhirrai
10	32	Chhirrai

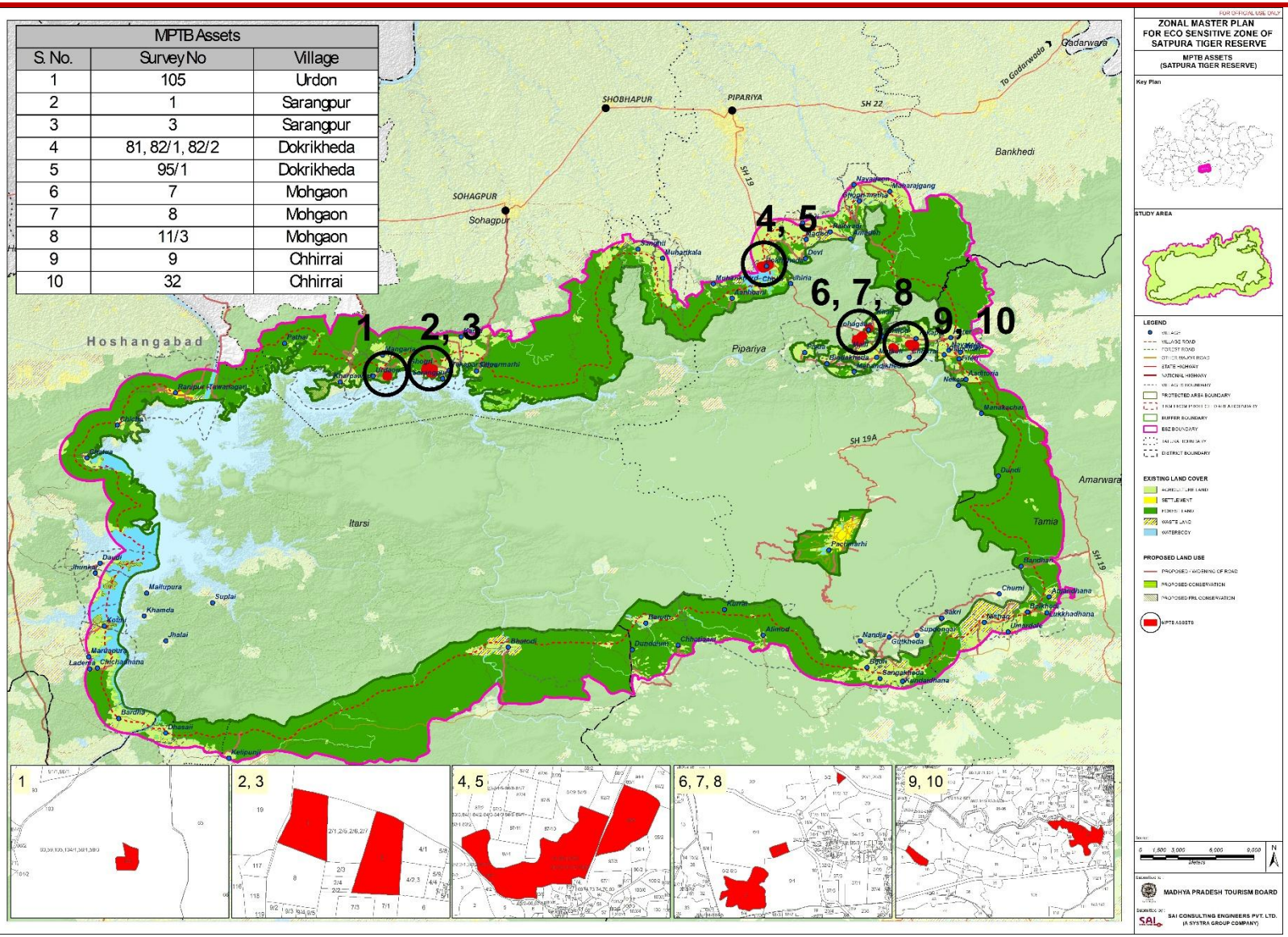


Figure 5- 2: MPTB Assets

1.2.5.2 Promotion of Sustainable Tourism

Satpura Tiger Reserve has the potential to be developed as eco-tourist destination. There are many unexplored destinations in Eco-Sensitive zone area, which can be developed as potential tourist sites and can be helpful to decrease burden on Pachmarhi. The proposals related to tourism development in Satpura Tiger Reserve are drawn with basic concept and components of proposals for tourism sites, enhancement of tourism activities in identified and existing sites, conservation to archaic historical sites, providing infrastructure to the tourism sites and promotion of tourism of STR. These components and broad strategies are shown below:

Note: The approval and implementation of the proposed land-use and proposed activities will be as per decision/prior permission by forest department and NTCA guidelines.[8]

Tourist Zones

Eco-Tourism Zone	Pisua cluster, Dhasai cluster & Bandhan cluster
Recreation Zone	Dokrikheda cluster & Tawa cluster
Rural Tourism Zone	Nishan Cluster
Natural Tourism Zone	Pachmarhi cluster & Alimod-Baruth cluster
Commercial zone	Matkuli Cluster

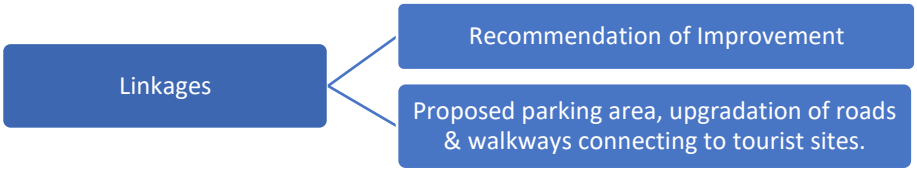
Enhancement of Tourism

Nature Walk / Trekking	Bandhan Dahelia, Satdhara-Manakachar, Alimod-Kurai Baruth
Camping	Bandhan, Dahelia, Baruth, Alimod
Adventure Activities	Tawanagar, Mangaria, Madhai, Bargondi, Baruth, Dokrikheda
Late evening Tourism	Star gazing at Chaurasibaba Temple, Pathai, Bargondi Handi kho. Kurai

Conservation/ restoration of sites

Conservation of ancient sites like Temple and historical monuments	•Maa satyawati Temple and stepwell near Tawanagar, Rock Painting at Panchmarhi, Arjun Gufa at Karer

Linkages



[8] As per discussion with the Field Director, Satpura Tiger Reserve mentioned in Minutes of Meeting vide dated 18th November 2020.

Basic infrastructure

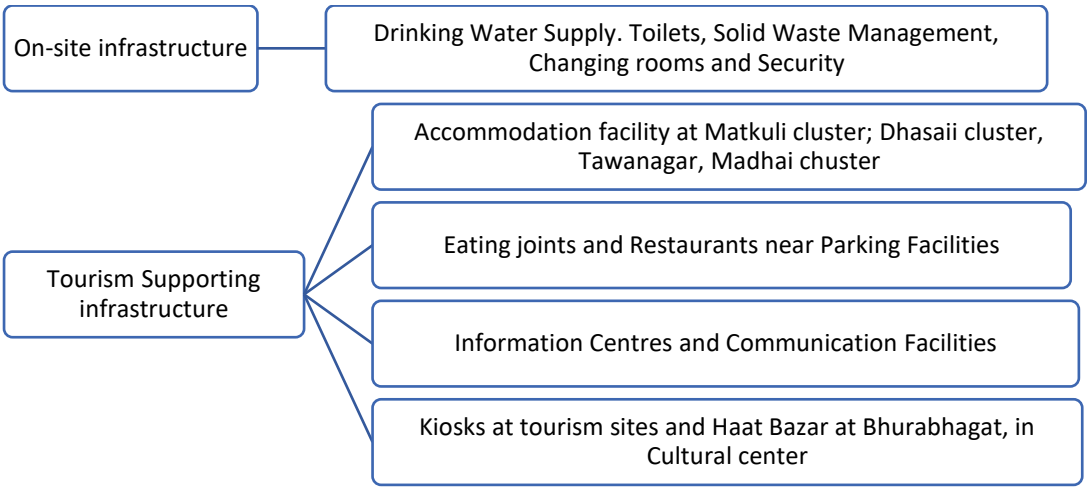


Figure 5- 3: Vision for Development of Tourism

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.

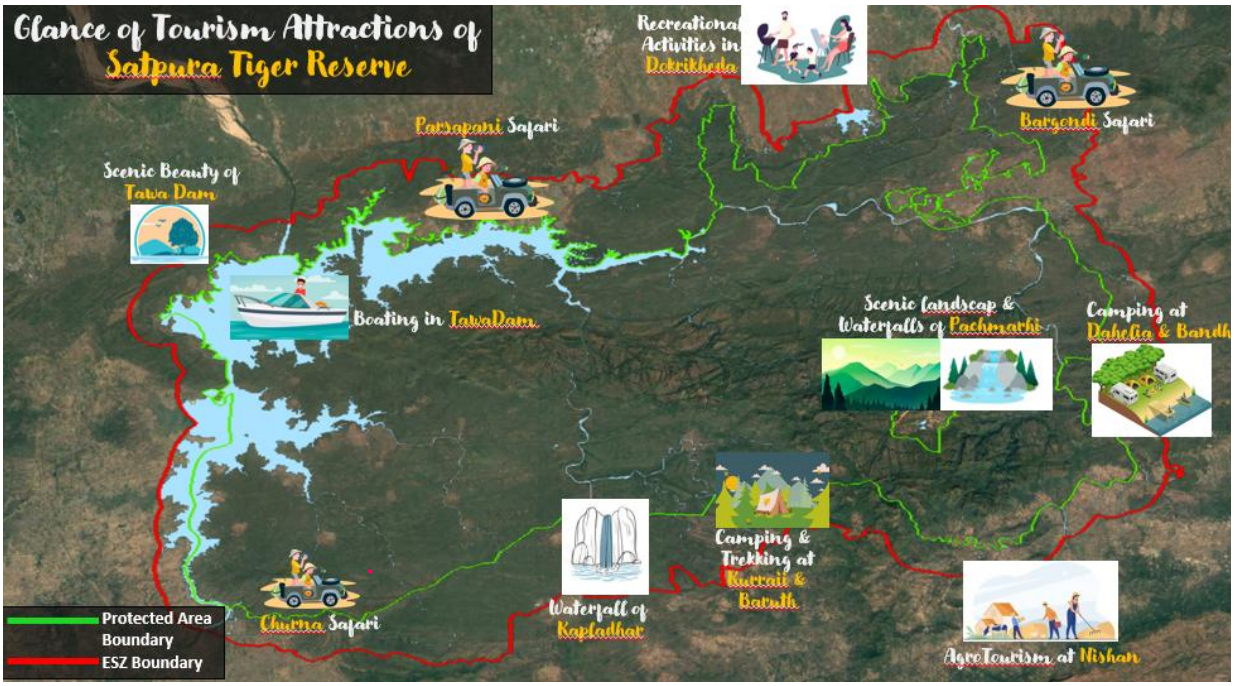


Figure 5- 4 : Glance of Tourism Attractions of Satpura Tiger Reserve

1.2.5.3 Tourist Zones

Satpura Tiger Reserve has the flourishing tourism and many potential sites to develop as unexplored tourist site. Tourism zones are Wildlife Tourism Zone, Eco-Tourism Zone, Recreation Zone, Rural Tourism Zone, Natural Tourism Zone and Commercial zone. 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.

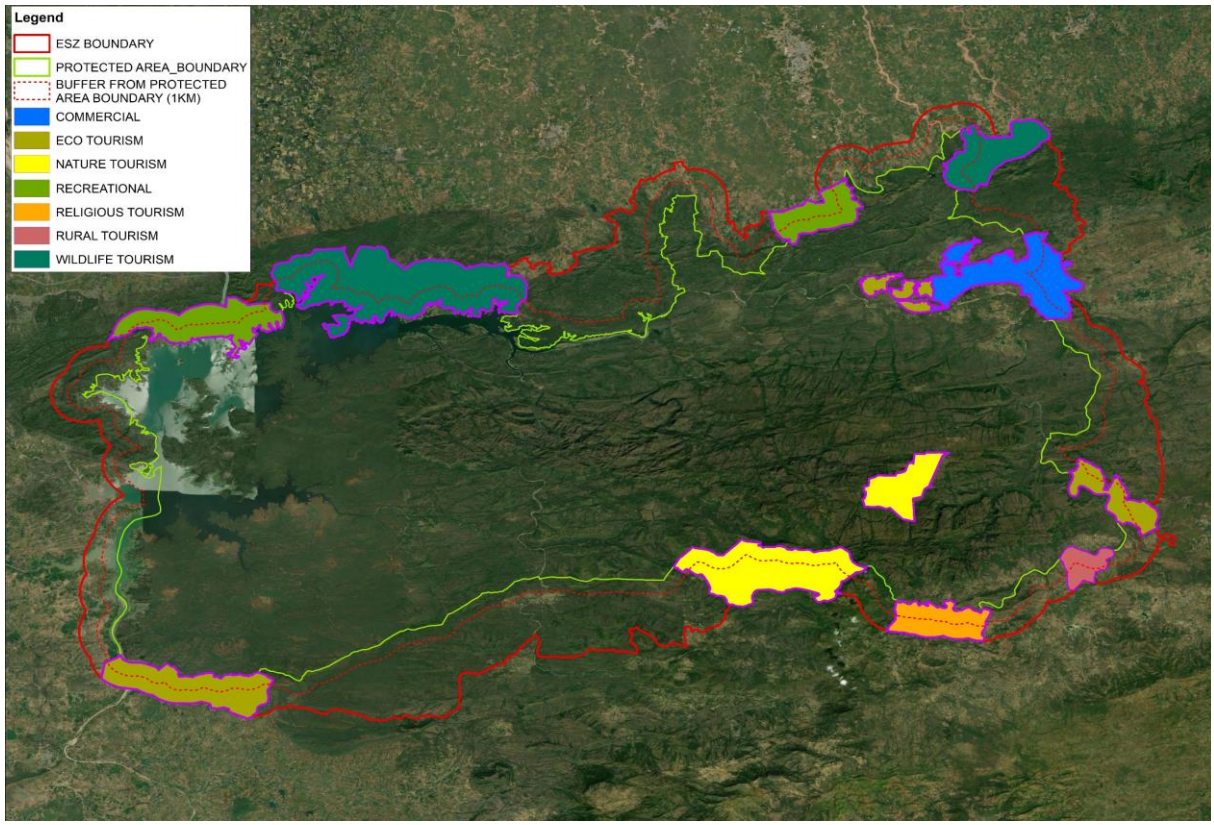


Figure 5- 5 : Tourism zones in Satpura Tiger Reserve

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 Satpura Tiger Reserve as follow:

Table 5- 1: Tourist Zones

Sr No	Tourism Zone	Tourism clusters
1	Eco-Tourism Zone	Pisua cluster, Dhasai cluster & Bandhan cluster
2	Tourism based Activity Zone	Dokrikheda cluster & Tawa cluster
3	Rural Tourism Zone	Nishan cluster
4	Nature Tourism Zone	Pachmarhi cluster & Alimod-Baruth cluster
5	Commercial & Accommodation Zone	Matkuli cluster

1.2.5.3.1 Wildlife Tourism Zone

Satpura Tiger Reserve has the diversities in flora and fauna. Presence of northern and southern region forest and wildlife can be found in Satpura Tiger Reserve. The Region is known as Biodiversity hotspot. Satpura Tiger has core wildlife safaris in Madhai, Churna, Mallupura, panaarpani and buffer wildlife safari is ongoing in Paraspani Jamanidev, Bargondi, Tamia and Delakhari area. These existing wildlife safaris should be upgraded with better infrastructure/tourism facilities to attract the more tourist footfall.

Parsapani Cluster

The cluster includes notified villages of Pathai, Mangaria, Urdaon, Kharpawad, Ghoghri, Kamti, Tekapar Chaurmarhi and Sehra. Madhai is the popular destination for the tourism. The spot is famous for its wildlife tourism and safaris. Jamanidev Safari and Parsapani safari are for buffer safari and Madhai Safari for protected area safari. Additionally, an interpretation center and nature museum has to be proposed to aware people about forest and history of forest in Mangaria village and Sarangpur village.

Naturopathy based Resorts

Museums

Amphitheatres

Forest Based Adventure Activities

Interpretation Centres

Table 5- 2: The following Activities are proposed in Parsapani Tourism Cluster:

Sr No	Proposed Activities
1	Adventure Zone
2	Naturopathy Resorts
3	Amphitheatre
4	Interpretation Centre at Sarangpur
5	Interpretation Centre and Museum at Mangaria

Bargondi Cluster

Bargondi is surrounded by dense forest of Satpura Tiger Reserve. Area is habitat to wild animals like Leopard, Sambhar, Deer, Chittal, Gaur and many more. Bargondi has the undulating terrain which is suitable to adventure activities as well as nature walk. At distance of 1 km there is a Sangam Kund in protected area from which a nature trail to Bargondi is proposed. The proposed activities are as below table.

Table 5- 3: Proposed activities in Bargondi cluster

Sr No	Proposed Activities
1	Nature Trail – Hill Point
2	Nature Trail – Sangam Kund
3	ATV / Bike ride Track
4	Adventure Zone

1.2.5.3.2 Eco – Tourism Zone

As per The International Ecotourism Society, Ecotourism is now defined as "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education".

Satpura Tiger Reserve has potential spots to develop the eco-tourism activities in region of Dhasai cluster, Bandhan Cluster and Pisua Cluster.

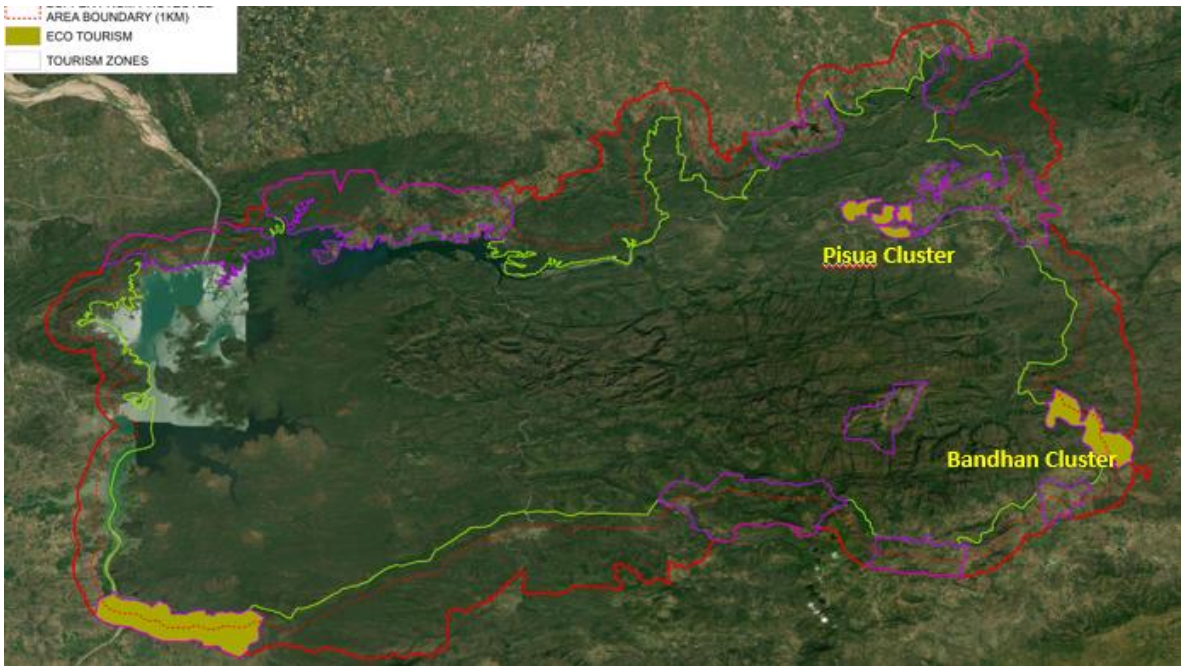


Figure 5- 6 : Proposed Eco Tourism Zones

Nature Trail, Bird watching and nature exploration with walking and camping is proposed in eco-tourism zones.

Bandhan Cluster

The cluster has the rich forest, landscape of Satpura and Denwa river makes this place ideal for camping. Apart from this, Dahelia is Part of Forest trail and has a good camping event. The track of existing nature trail is between Bandhan and Dahelia runs through forest and river. The track is proposed for cycling and a nature walk both. Both Bandhan and Dahelia are proposed for camping at riverside.

Figure 5- 7 : Nature trail Bandhan - Dahelia Cluster

Table 5- 4: Proposed activities for Bandhan cluster

Sr No	Proposed Activities
1	Nature Trail – Bandhan to Dahelia
3	Proposed Camping site - Dahelia
4	Proposed Camping site - Bandhan

Dhasai Cluster

Dhasai is the entrance area for Churna safari. Bhimkund Barrier near Dhasai is used as Entrance to Churna. The cluster includes Bardha and Dhasai village. Accommodation is proposed on riverbanks near to villages of Dhasai and Bardha along with camping. The cluster has one waterfall sites of Kapladhar waterfall in cluster. The waterfall has the most significance sight from 2 sides of mountains. Along with these activities, a nature trail is proposed in the cluster for exploration of nature by walk.

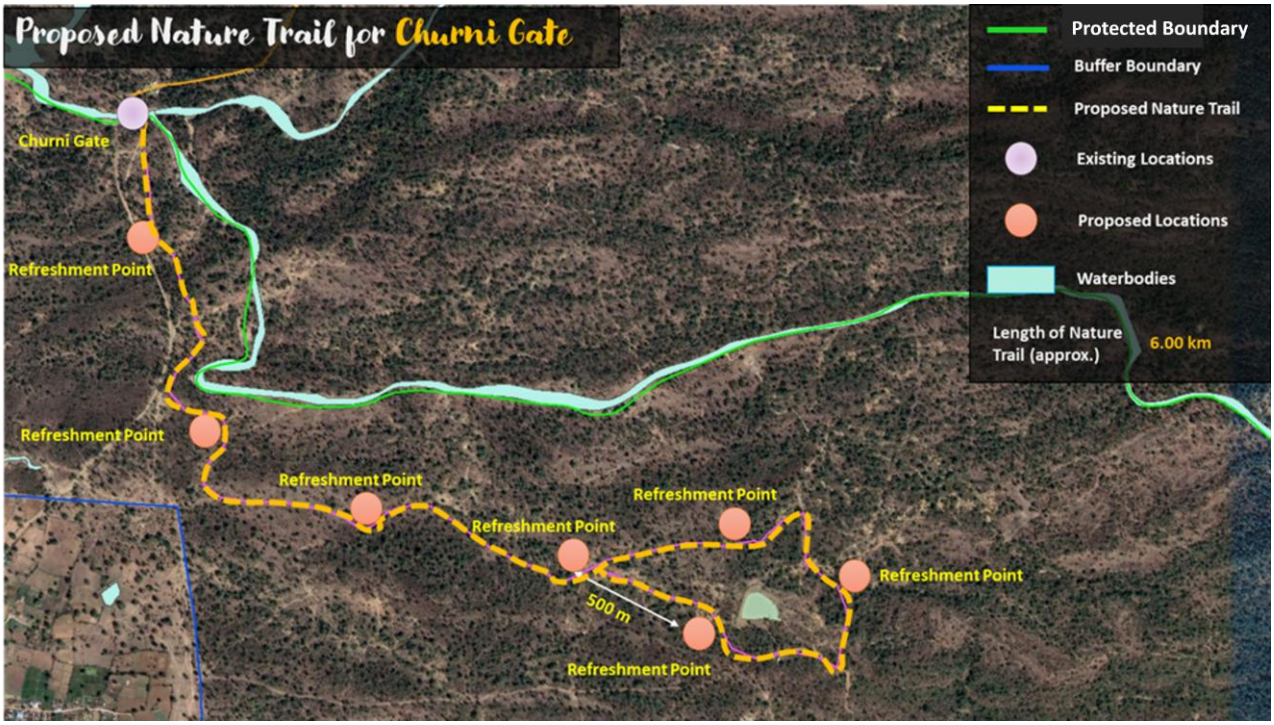


Figure 5- 8 : Proposed nature walk in Dhasai Cluster

Table 5- 5: Proposed activities in Dhasai cluster

Sr No	Proposed Activity	Tentative Area (m^2) / length (km)
1	Nature Trail – Churna Gate	6 km

Pisua Cluster

Pisua cluster is surrounded by protected boundaries. Presence of wild animals are often observed in the cluster. As the conservation is prime for the area only camping is proposed in cluster. The vehicles and nature trail routes are nearby from the cluster which strengthens the connectivity with protected area. The cluster can be further developed as major entrance point to protected area of STR.

1.2.5.3.3 Tourism Activity Zone

With having beautiful natural sceneries, places like Dokrikheda and Tawanagar are suitable place for the recreational activities. Dokrikheda dam is proposed for multiple recreational activities like boating, floating market, Parks and picnic points, flower garden and many more. Tawanagar has advantage of Tawa dam and can be developed as recreational and peaceful accommodation with having multiple activities in surrounding. The place has potential to be developed as weekend destination.

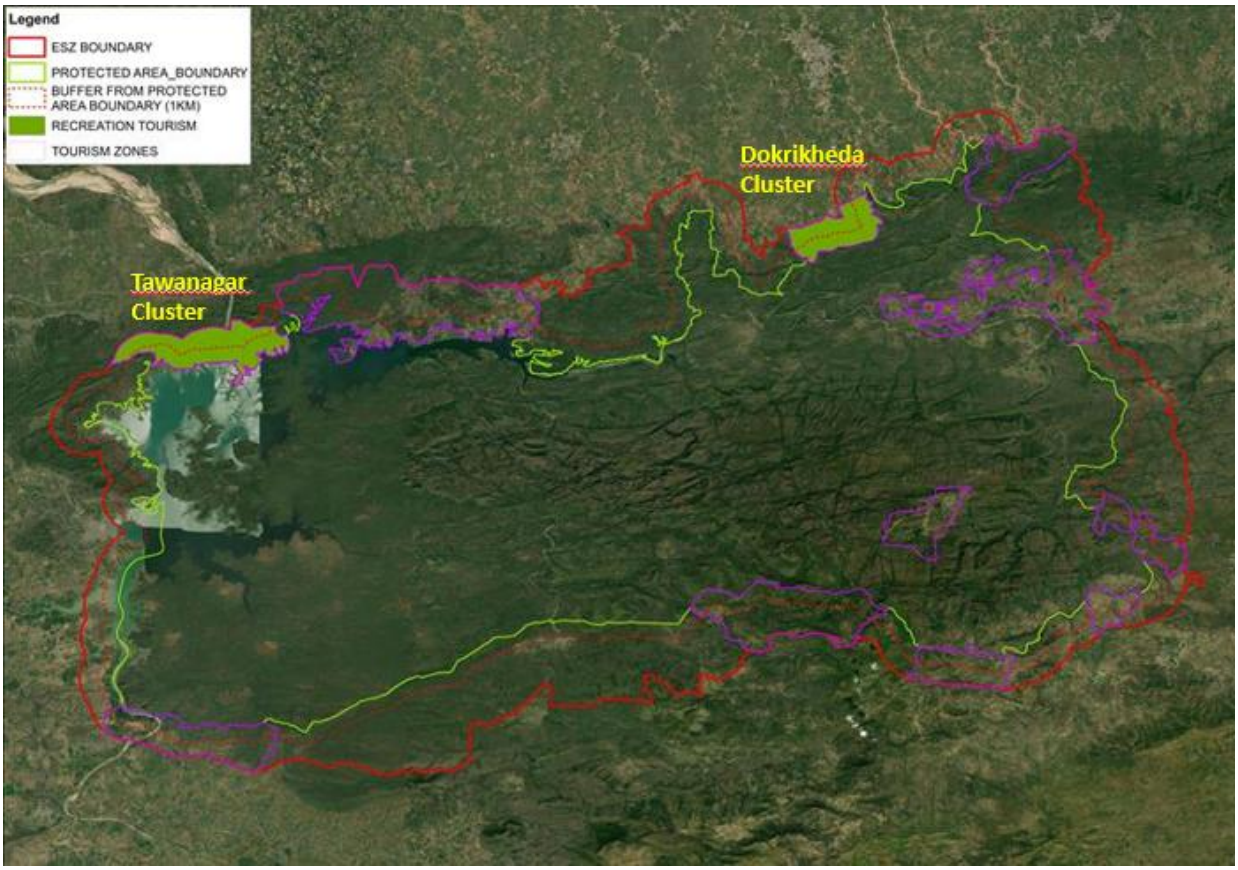


Figure 5- 9 : Proposed Recreational tourism zones

Ranipur – Tawanagar Cluster

Ranipur-Tawanagar is densely populated center of Satpura Tiger Reserve situated at Tawa Reservoir. The recreation and economic activities in Tawa dam are ban as it is part of the protected area. From Tawanagar, a beautiful view for the Reservoir with landscape of Satpura. The chaurasi baba temple is proposed viewing point as it has view of whole Tawa reservoir and forest with beautiful landscape of Satpura hills. At Dam side, Flower Park and Garden with picnic point and Camping is proposed for recreational purpose. The viewing points are proposed in the park and garden area for experiencing scenic beauty of landscape of STR.

Figure 5- 10 : Proposed activities in Ranipur-Tawanagar cluster

Table 5- 6: Proposed activities in Ranipur-Tawangar cluster

Sr No	Proposed Activity
1	Nature Trail – Tawanagar to Chaurasi Baba
2	Boating in Tawa River
3	Adventure Zone
3	Accommodation
4	Flower Park, Garden and Picnic Points
5	Camping
6	Commercial

Dokrikheda Cluster

Dokrikheda is a courtyard of Satpura Tiger Reserve located 13 km from Pipariya and Matkuli on SH 19. A nice scenic beauty for satpura can be experienced from the dam site of Dokrikheda. The region has the potential for recreation development. The cluster also includes religious place of Anhoni hot spring water nearby. Proposal for Park & Gardens, Audio & Video Museum with interpretation center, Flower Park, Monument Park or culture park & Camping site is proposed on shore of the Dokrikheda dam. A sericulture seed production center is located at nearby area of Dokrikheda. The center is proposed to develop as a sericulture experience center and exhibition of silk products. Proposal for parks and camping is provided at Choka, southern side of dam site.

Table 5- 7 : Proposed activities for Dokrikheda Dam

Sr No	Proposed Activity
1	Mela/Open Ground
2	Food Street
3	Water adventure activity lounge
4	Interpretation Centre & AV Museum
5	Parks & Garden
6	Flower Park
7	Sericulture Centre
8	Camping Site - Dokrikheda
9	Camping Site - Choka
10	Monument & Cultural Park

1.2.5.3.4 Rural Tourism

Government of India explains Rural Tourism as "*Any form of tourism that showcases the rural life, art, culture and heritage at rural locations, thereby benefitting the local community, economically and socially, as well as enabling interaction between the tourists and the locals for a more enriching tourism experience can be termed as rural tourism. Rural tourism is essentially an activity that takes place in the countryside. It is multi-faceted and may entail farm/ agricultural tourism, cultural tourism, nature tourism, adventure tourism and eco-tourism. As against conventional tourism, rural tourism has certain typical characteristics like-it is experience oriented, the locations are sparsely populated, it is pre-dominantly in natural*

environment, it meshes with seasonality and local events and is based on preservation of culture, heritage and tradition."

Rural tourism is unique to its locality, with food, products, and landscapes shaped by generations. It offers authentic experiences, allowing local communities to celebrate and take pride in their culture. Tourism in rural areas creates jobs, fosters business growth, and supports micro-businesses, helping to maintain rural employment where other opportunities may be scarce. Developing tourism products based on natural assets, such as wildlife, presents a potential business opportunity.

Rural tourism also educates visitors about agriculture, farming, and local governance, while dispelling myths about rural life, like concerns over hygiene or safety. It allows tourists to explore the diverse culture and traditions of rural India.

Activities in rural tourism include walking, adventure sports, sightseeing, cycling, river boating, camping, horse-riding, nature and bird watching, arts and crafts, music and dance, festivals, and enjoying local food, drink, and accommodations. These experiences help visitors connect with the rural lifestyle and contribute to the preservation and promotion of local heritage. Few notified villages are identified, and activities and infrastructure are proposed for development of tourism activities by Madhya Pradesh Tourism Board under Rural Tourism Project as mentioned below in table.

Table 5- 8: Proposed activities by Rural Tourism Department MPTB

S. No.	District	Name of Activity Village	Block	Proposed Activitiy	Proposed Activitiy	Proposed Activitiy
1	Hoshangabad	Urdaon	Sohagpur	Community drinking water	Community conference hall	Streetlight
2	Hoshangabad	Teka par Chourmarhi	Sohagpur	Community conference hall	Water supply for agriculture farm	Streetlight
3	Hoshangabad	Kamti	Sohagpur	Road communication	Community conference hall	Streetlight
4	Hoshangabad	Pathai	Sohagpur	Community drinking water	Community conference hall	Streetlight
5	Hoshangabad	Sehra	Sohagpur	Community drinking water	Community conference hall	Streetlight
6	Hoshangabad	Chhirai	Pipariya	Community drinking water	Community conference hall	Streetlight
7	Chhindwada	Belkhedi	Tamia	Community Pond for water supply to agriculture	Community conference hall	Streetlight

(Source: Rural Tourism Department, Madhya Pradesh Tourism Board)

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, tranquillity, 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).

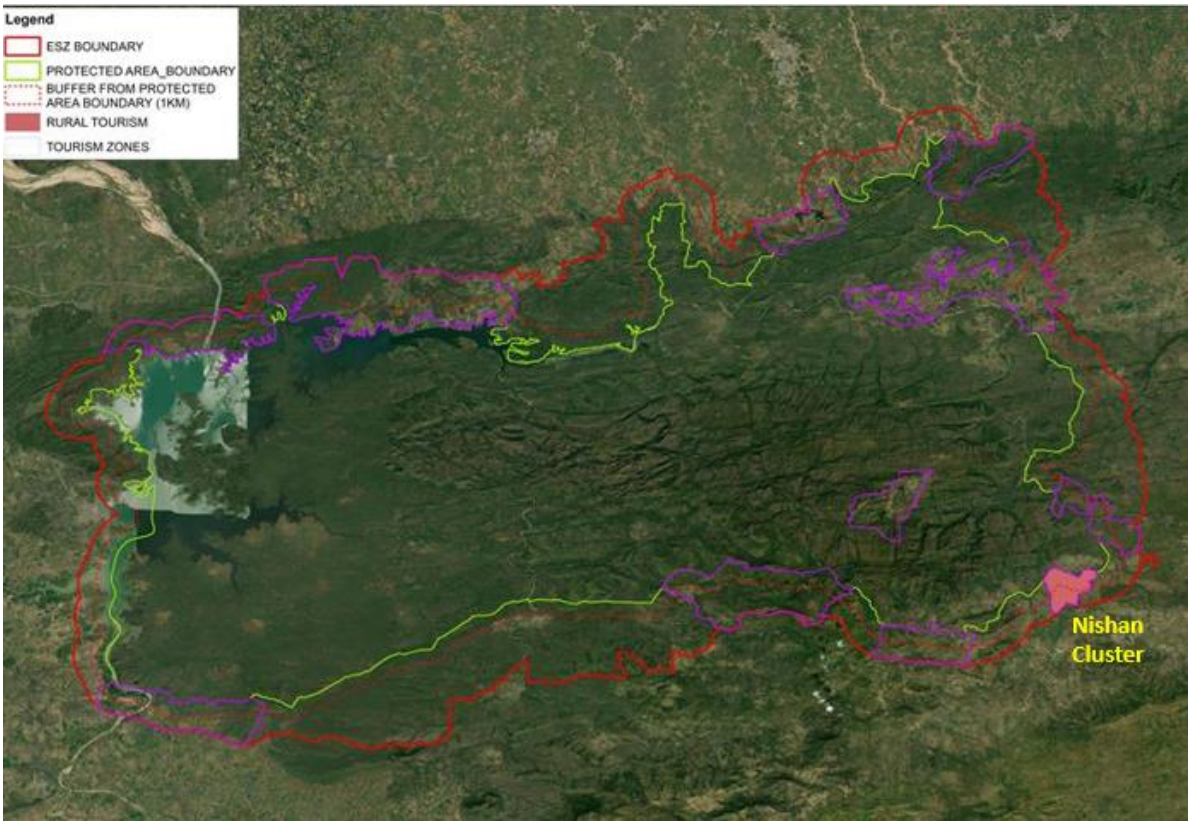


Figure 5- 11 : Rural Tourism zone in Satpura Tiger Reserve

Satpura Tiger Reserve is not just habitat to flora and fauna, but it is habitat to the Gond and Baiga Tribes. On the name of Gonds, the land is known as Gondwana land. The culture of this tribes is rich and full of arts like painting, dancing, foods and many more. The tribes have certain way of living and exploring the forests through activities like farming, honey collection and many more. As the area is a little in isolation, the culture, and activities for rural has preserved here. Hence, the rural tourism can be promoted in the area. In Nishan village, a thematic cultural park is proposed in which the culture of tribal can be experienced by the tourists various cultural and economic activities. A boating route from the cultural park to Bandhan Camping site is proposed for betterment via water connectivity. The Major Activities include in the rural tourism is Community farming, village markets, walking, cycling, farms shops, agriculture practices, local food, nature, camping and accommodation in rural areas.

Table 5- 9: Proposed activities

Sr No	Proposed Activity
1	Walkway – Nishan to Campsite
2	Boating
3	Camping - Nishan
4	Cultural Theme Park

1.2.5.3.5 Nature Tourism Zone

Satpura Tige Reserve is the biodiversity hotspot of central India with having different type of flora fauna, suitable landscape, rivers and streams. The natural beauty of STR is majorly can be experienced from Pachmarhi, because of its high altitude and landscape. The other way to explore the STR is Baruth & Alimod located amidst variety of landscape with dense forest.

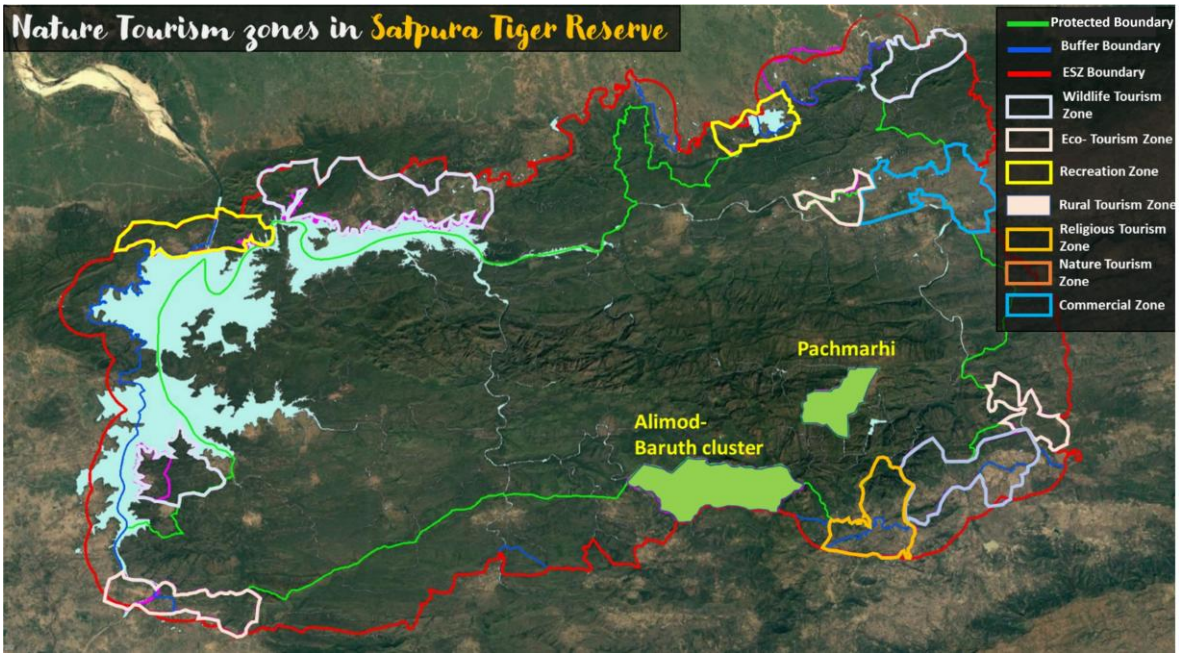


Figure 5- 12 : Nature Tourism Zone

Alimod-Baruth Cluster

Alimod is beautiful place in southern region and the place is the entrance for Mahadeo Mela and Nagdwari Mela. In surrounding of Alimod, Ghoghra waterfall and Jamundeep are two major attraction for nature exploration and viewpoints. Kurrai is proposed as campsite location for STR as it is located in dense forest surrounded by the mountains of STR. Rorighat Darshan provides landscape view for the Satpura Tiger Reserve. A nature trail & trek is proposed for both places. Kurraii is also proposed for late night stargazing site as it is isolated and clear visibility of sky.

Figure 5- 13 : Proposed nature walks in Alimod-Baruth cluster

The proposed activities are as below table.

Table 5- 10: Proposed activities in Alimod Baruth cluster

Sr No	Proposed Activity
1	Nature Trail – Alimod to Rorighat Darshan
2	Nature Trail – Alimod to Kurraii
3	Nature Trail – Alimod to Jamundip
4	Campsite - Kurrai
5	Naturopathy Centre and Resorts - Alimod

Baruth is proposed with adventure zone and camping sites in the area. Baruth has the most significant location for camping as it is surrounded by mountains and river streams from all sides. The proposed activities are as below table.

Table 5- 11: Proposed activities in Baruth

Sr No	Proposed Activity
1	Camping site - Baruth
2	Water Adventure Zone
3	Adventure Zone

Pachmarhi Cluster

Pachmarhi is situated at altitude of 1067 m. Surrounding areas of Pachmarhi has beautiful landscape view and waterfalls. Apart from view and waterfalls, Pachmarhi has the number of ancient places and beautiful pools in area. Pachmarhi has the existing recreational activities like Boating Club at Pachmarhi Lake, Butterfly park near to Paraspani, Bison lodge and Interpretation center with amphitheater at Dhoopgarh. Tourism in pachmarhi further can be classified as heritage sites, viewpoints, waterfalls, nature exploration sites and pools.

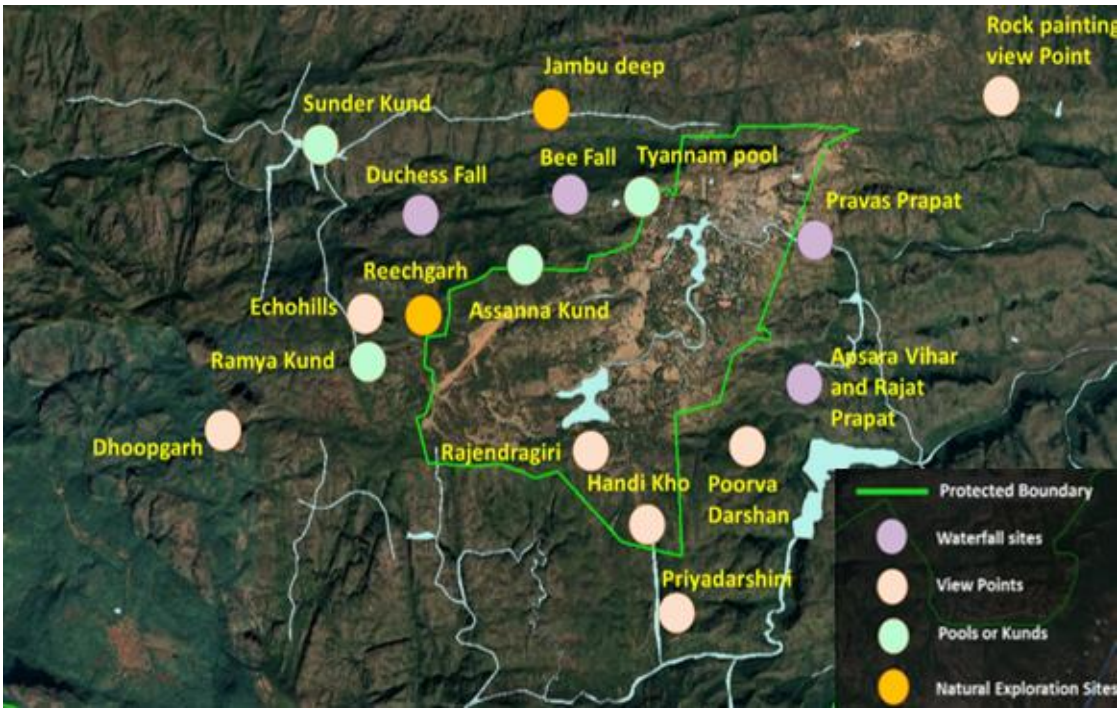


Figure 5- 14 : Tourism sites nearby Pachmarhi

Waterfalls in the area are limited, with significant flow occurring mainly during the rainy season. Major waterfalls like Bee Fall, Rajat Prapat, and Apsara Vihar near Pachmarhi are popular tourist spots. The proposed Pravas Prapat waterfalls near Pachmarhi, with their natural beauty and surrounding landscapes, could also be developed as potential tourist destinations.

The Pachmarhi plateau is surrounded by hills with varying heights and peaks, some difficult to access due to challenging terrain. The rocky terrain can be slippery, especially after rains, so caution is necessary. Pachmarhi offers many viewpoints with panoramic views of the surrounding natural landscape, most of which are accessible by road.

Infrastructure like dustbins, water standposts, toilets, and changing rooms should be provided at tourism sites. The area also features numerous streams and pools, such as Sundar Kund, Ramya Kund, and Tayannam Kund, ideal for swimming.

Satpura's forests and natural landscapes offer a variety of falls, streams, and scenic views. Jamundeep and Reechgarh are popular spots for nature walks and forest exploration, with similar infrastructure needed for these activities.

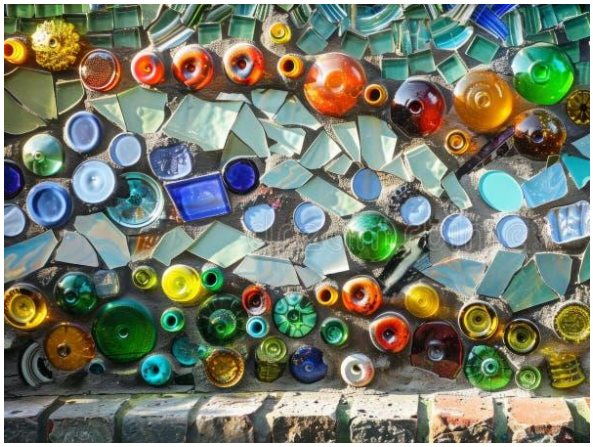
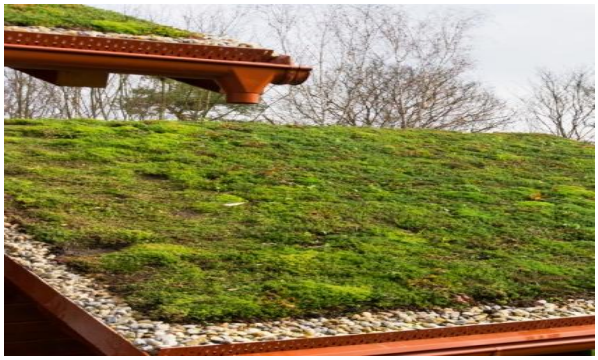
1.2.5.3.6 Commercial & Accommodation Zone

Matkuli has regional linkage with Piparia, Pachmarhi, & Chhindwara via SH19 & SH19A. Matkuli is bordered by the protected area on three sides. The focus of development in Matkuli is to provide an alternate for Pachmarhi. Commercial development with accommodation for tourists is proposed in the cluster. All the proposed sites are not in 1 km buffer from protected boundary as the notification for ESZ satpura Tiger Reserve prohibits construction for commercial activities in 1 km from protected boundaries. Apart from commercial development, Cluster has one archaeological site of Arjun Gufa and other famous location of Satdhara.

1.2.5.3.7 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	

1.2.5.3.8 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 Satpura 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.

1.2.5.4 Enhancement of Tourism Activities in identified tourist sites

Note: The approval and implementation of the proposed land-use and proposed activities will be as per decision/prior permission by forest department and NTCA guidelines.[9]

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.

1.2.5.4.1 Nature Trails

Nature Trails are best way to explore the nature by walking in forest, acknowledging about flora fauna and taking experience to wander in forests. STR has very dense and bio-diverse forest. Proposed nature trails are for Bargondi, Bandhan-Dahelia, Alimod & Dhasai. All locations have advantage of forest and waterbody both.

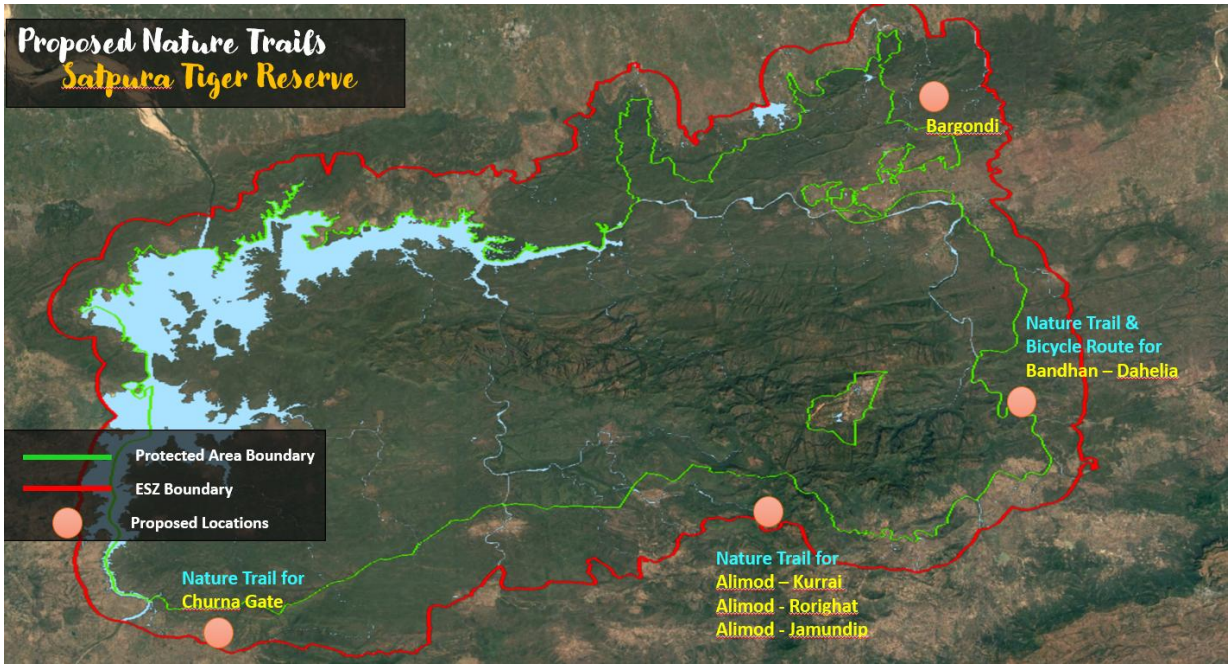
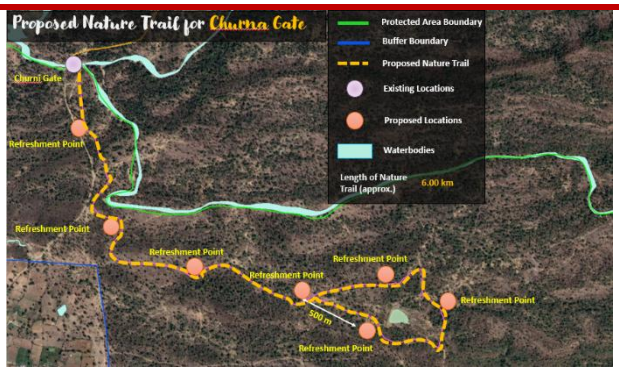


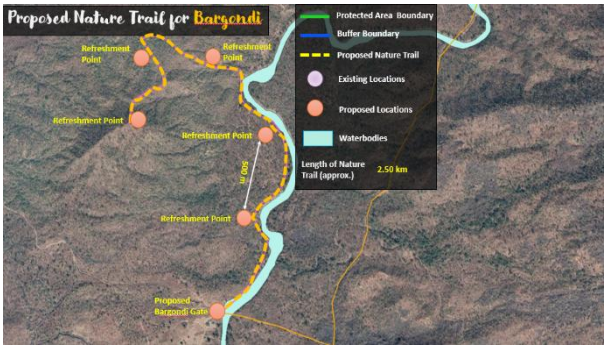
Figure 5- 15 : Proposed nature trails in STR

[9] As per discussion with the Field Director, Satpura Tiger Reserve mentioned in Minutes of Meeting vide dated 18th November 2020.


Proposed Tourism for Alimod
Borighat Darshan
Kurrail
Proposed camping Site
4.6 km
1.5 km
Proposed Naturopathy Resorts
Jamundip
2.5 km
Alimod Village
Ghodhra Waterfall
Refreshment points to be provided with toilets & Water stand posts at interval of 500 m distance
Protected Boundary
ESZ Boundary
Alimod to Borighat
Alimod to Kurrail
Alimod to Jamundip
Existing Locations
Proposed Locations
Waterbodies


Proposed Nature Trail for Chuirna Gate
Churni Gate
Refreshment Point
Refreshment Point
Refreshment Point
Refreshment Point
Refreshment Point
Refreshment Point
500 m
Refreshment Point
Protected Area Boundary
Buffer Boundary
Proposed Nature Trail
Existing Locations
Proposed Locations
Waterbodies
Length of Nature Trail (approx.) 6.00 km


Proposed Nature Trail for Dahelia - Bandhan
Dahelia Camp site
Refreshment Point
Refreshment Point
Refreshment Point
Refreshment Point
Refreshment Point
Refreshment Point
500 m
Refreshment Point
Refreshment Point
Bandhan Village
Protected Area Boundary
ESZ Boundary
Proposed Nature Trail
Existing Locations
Proposed Locations
Waterbodies
Length of Nature Trail (approx.) 5.40 km


Proposed Nature Trail for Bargondi
Refreshment Point
Refreshment Point
Refreshment Point
Refreshment Point
500 m
Refreshment Point
Proposed Bargondi Gate
Protected Area Boundary
Buffer Boundary
Proposed Nature Trail
Existing Locations
Proposed Locations
Waterbodies
Length of Nature Trail (approx.) 2.50 km

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- 16 : 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- 17 : 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- 18 : Rest Huts

1.2.5.4.2 Camping

Camping is the best way to experience the nature with many components like river, mountain, and flora fauna. Satpura Tiger Reserve has some of most suitable sites for camping to experience the nature. Dahelia is the existing site for camping in Satpura Tiger Reserve. The camping site is at riverbanks of river Denwa surrounded by the nature. Camping site is proposed with having consideration of various factors of view from the location, forest in surrounding area, presence of wild animals and many more.

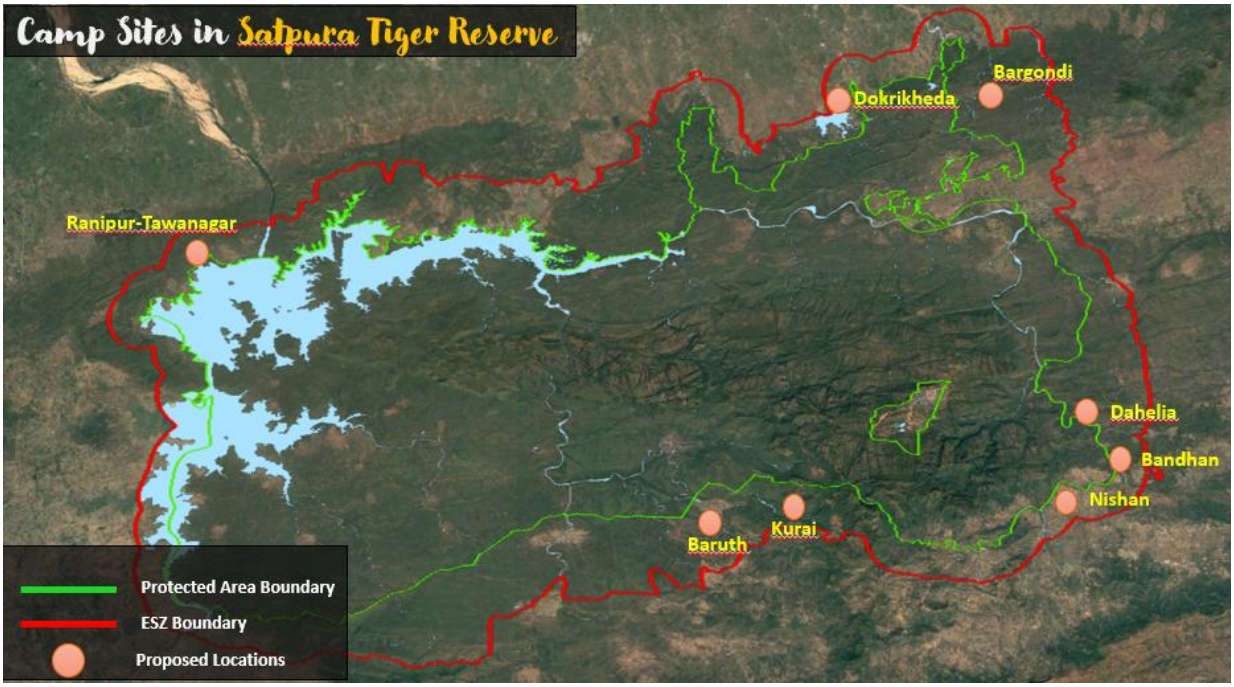


Figure 5- 19 : Proposed camping locations in STR

Ranipur-Tawanagar, and Baruth are alongside the waterbodies. These sites provide beautiful view of Tawa Reservoir and Denwa River. All sites are surrounded by less dense forest and have minimum animal movement. Bargondi and Kurai are surrounded by the dense forest and provides 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, Kitchen, Parking, Portable toilets and bath. The rules and regulation will be as per decided by responsible authority of Satpura Tiger Reserve.

Table 5- 12: Camping Location

Sr No.	Camping Location	Sr No.	Camping Location	Tourism Infrastructure
1	Ranipur	5	Bandhan	Tourist Lounge with Waiting area, reception, and Ticket counter. Toilets, Bathrooms, Kitchen, dining area, Locker room, Activity Areas.
2	Dokrikheda	6	Nishan	
3	Bargondi	7	Kurrai	
4	Dahelia	8	Baruth	

A layout of camping site at dokrikheda is prepared for an example to develop the camping site in recreational areas.

Figure 5- 20 : Conceptual layout for camping site at Dokrikheda

A camping unit of size 3m x 4 m = 12 m^2 is proposed in tents with purpose to maintain privacy of tourists. A paved road for walkway of 5.0 m to interact with components of Camping site. Kitchen & Storage, Dining, Lounge including waiting rooms and staff rooms, Utility area with toilets, Security Cabin and Locker Room is proposed. A dam front side auditorium is proposed to enjoy the view of Dokrikheda dam and events in site. Other camping sites can be developed in recreational areas similar way.

1.2.5.4.3 Adventure Activities

Adventure Activities are Proposed at Bargondi, Sarangpur, Mangaria, Baruth and Chaurasi baba Temple area. These activities are mainly forest based adventures. Madhai and Mangaria are on flat terrain, while Bargondi and Chaurasibaba has hilly terrain. These areas can be developed as adventure zone with the required infrastructure.

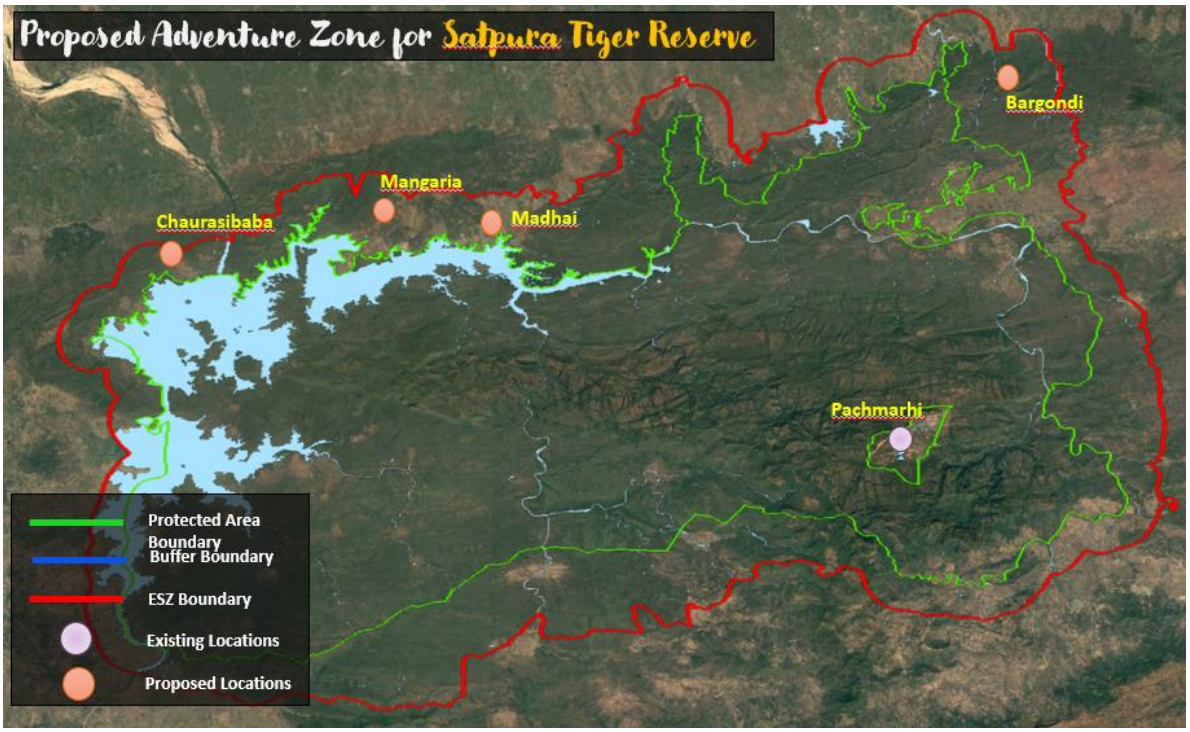


Figure 5- 21 : Proposed Adventure Zone for Satpura Tiger Reserve

Table 5- 13: Adventure Activities

Sr No.	Location	Adventure Activities	Tourism Infrastructure
1	ChaurasiBaba	Mountain Cycling and Mountain adventure activities	Tourist Lounge with Waiting area, reception, and Ticket counter. Changing Rooms, Rest Rooms, Toilets, Bathrooms, Food Kiosks
2	Mangaria	Adventure activities hot air ballooning, archery, Burma bridge Mirror House, Human slingshot etc.	
3	Sarangpur	Adventure Activities like commando net, gearing wall, paintball gun, free fall, multi vine, ladder climbing etc.	
4	Dokrikheda	Water Sports based adventure activities	
5	Bargondi	ATV riding, Mountain based adventure activities	
6	Baruth	ATV riding, Mountain based adventure activities, water-based adventure activities like river rafting, bamboo canoeing and many more.	

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 Satpura Tiger Reserve.

1.2.5.4.4 Late Evening Safari

Late Evening safari is a romanticizes experience with dense forest in late evening. Late Evening Safari Patrolling is ongoing in Satpura Tiger Reserve in areas of Bargondi, Jamanidev and Parsapani. Late Evening safari timings are from 5.30 PM to 9.00 PM. These areas can provide the rich experience of wildlife as well as forest under the starry dark late evening. The rules and regulations will be decided by the Satpura Tiger Reserve.

Star Gazing

Eco-Sensitive Zone of Satpura Tiger Reserve has the maximum amount of forest and only largely populated centres in the area. These leads to minimum amount of usage of lights and availability of clear visibility of dark sky with minimum disturbances.

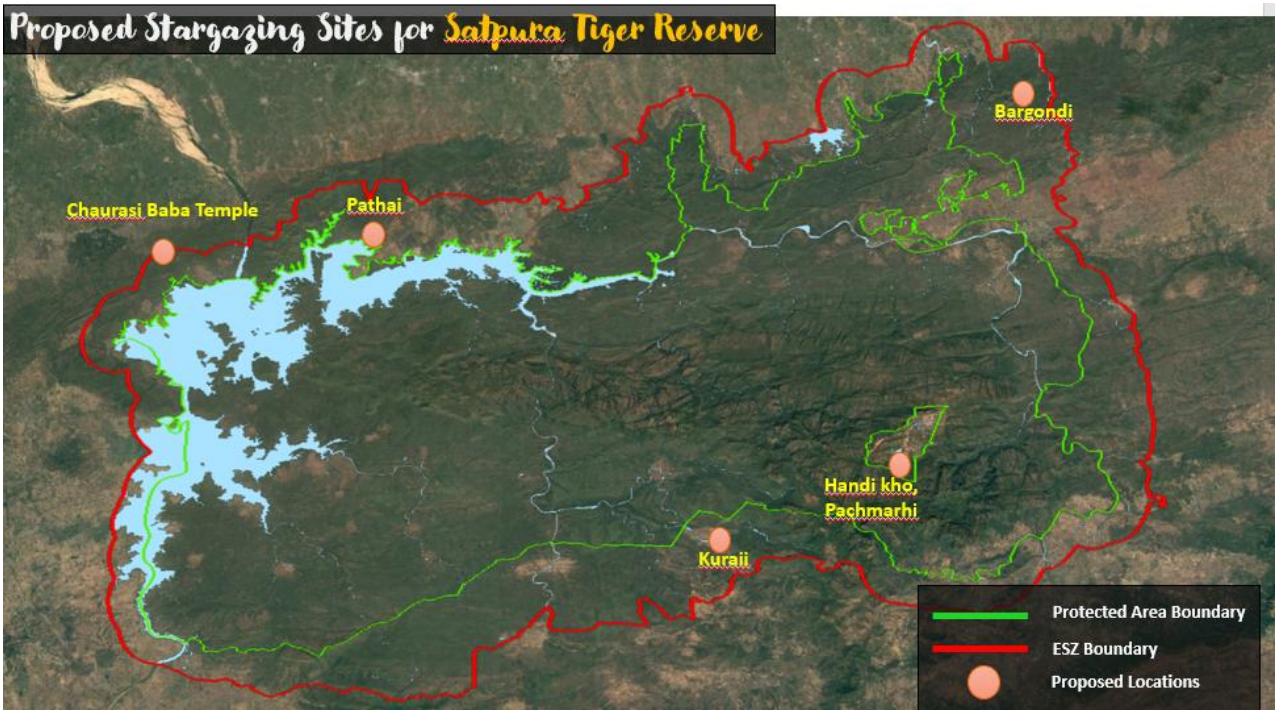


Figure 5- 22 : Proposed Stargazing Sites for Satpura Tiger Reserve

The suggestive proposed locations for stargazing are Chaurasibaba Temple, Pathai, Bargondi, Handi kho and Pachmarhi. Location of Chaurasibaba and Handi Kho are on heights and provides the beautiful landscape view of Satpura Range along with late evening t sky. Pathai and Bargondi are the part of Safari, which provides the wildlife experience as well as jungle late evening safari along with stargazing. Kuraii is in the lap of Satpura Mountain Range, provides the direct touch with nature and camping along with stargazing.

1.2.5.5 Conservation of Tourist Sites

Satpura Tiger Reserve have archaic heritage structures of stepwell of Rani near Ranipur, Arjungufa near Karer and Bagum Palace at Pachmarhi. These sites are in deteriorating condition and requires restoration. The restoration and conservation of these manmade heritage sites to be done by Directorate of Archaeology, Archives and Museums. The decision for tourist exposure of these sites can be decided by the monitoring committee.

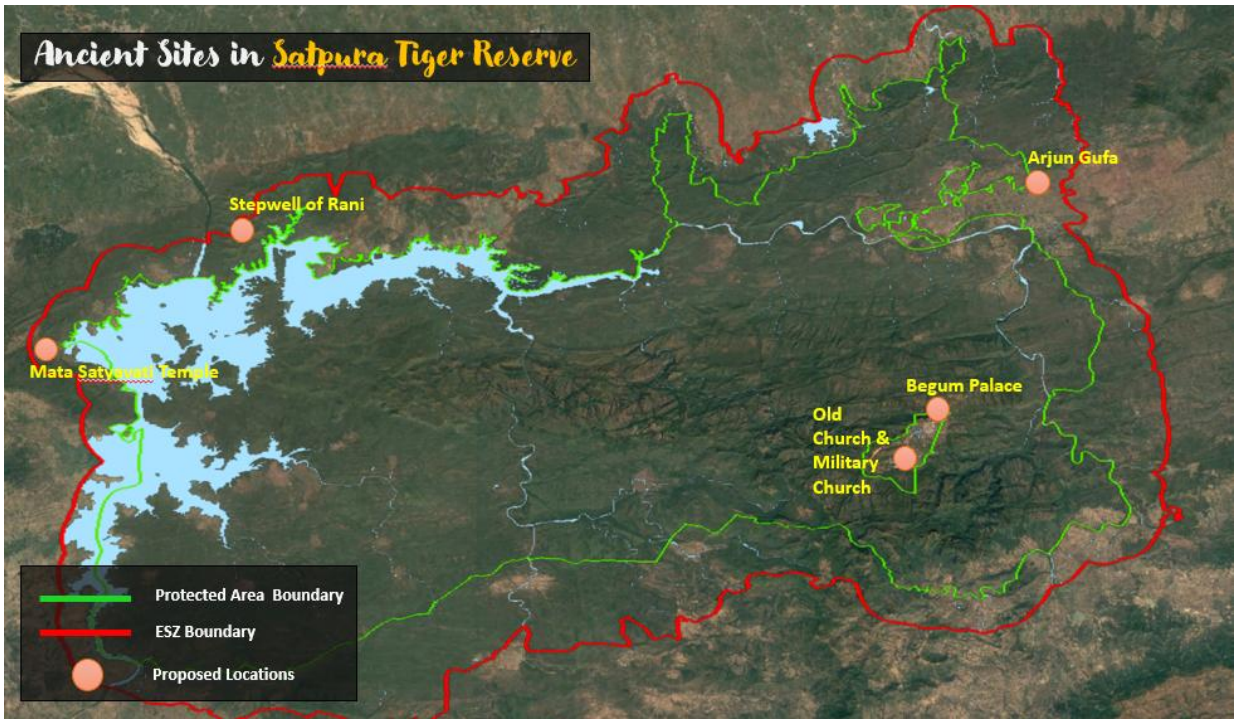


Figure 5- 23 : Archeological and man-made heritage sites of STR

1.2.5.6 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.	

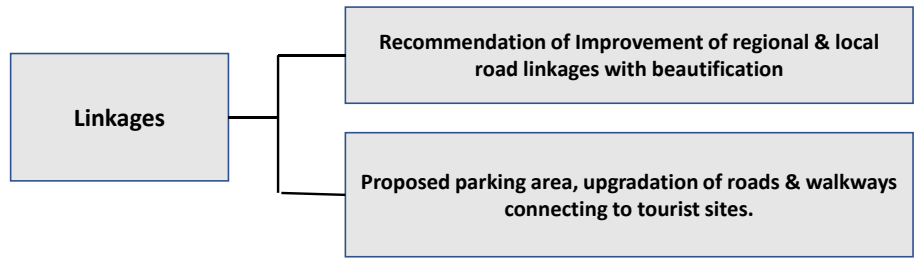
Camping (Low-Impact, Eco-Friendly) **Activity:** Setting up temporary, environmentally friendly campsites using biodegradable materials and following strict waste management practices. **Benefit:** Allows tourists to experience nature up close while maintaining a low environmental footprint. **Example: 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.

1.2.5.7 Connectivity Linkages



Linkages are proposed on regional as well as local level to provide better connectivity in STR. A widening of routes is proposed in STR to provide connectivity to villages as well as tourism sites.

The major connectivity in STR is via road. Proposal for widening of roads in Tiger Reserve is proposed and the connectivity to internal villages and tourism sites proposed for newly proposed road or improvement.

Figure 5- 24 : Existing Situation of Roads

Figure 5- 25 : Proposed Roads

Figure 5- 26 : Beautification of Roadside

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

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.

1.2.5.7.1 Walkway

Not all the sites in STR 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- 27 : Walkway

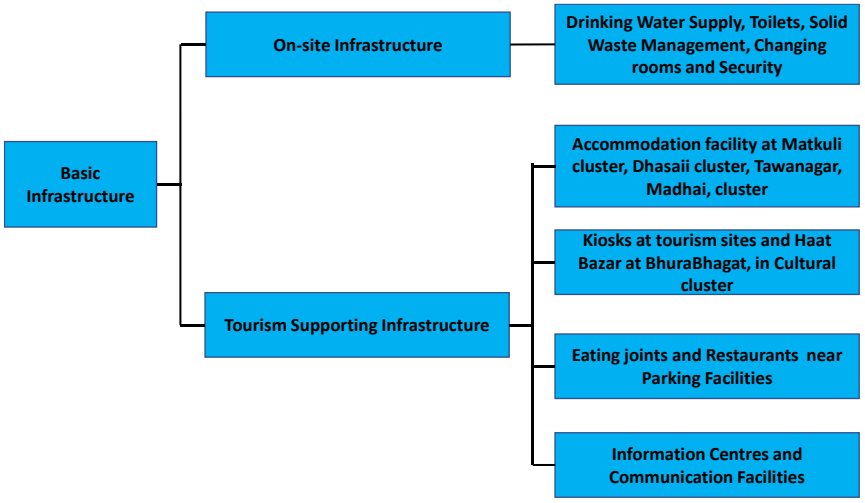
Street Food is essential part of recreation experience. The food street market is proposed at Dokrikheda to complete the recreational activities. Food van are permitted in market with having proper chair and table facility in area.

Figure 5- 28 : Food Street, Dokrikheda

Dokrikheda Dam is courtyard to Satpura Mountain range. 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 can also be provided for attraction to the dam.

Figure 5- 29: Dam site Walkway in Dokrikheda

1.2.5.8 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- 30: INFRASTRUCTURE

All tourist infrastructure shall be constructed by using nature friendly materials wherever it is possible. For other materials, a uniform colour suitable to the site shall be selected to bend it with nature. The minimum usage of harmful materials shall be promoted. Single infrastructure for suitable nearby tourist sites (which are in distance of less than 4 km) can be developed conjointly. Following tourist infrastructure is provided on tourism sites as on-site and supportive infrastructure.

Table 5- 14: Proposed Tourist Infrastructure Facilities

Sr. No	Proposed Tourism Activities	Suggested Tourism infrastructure Facilities
1	**Nature Walk**	Barriers, Rest Rooms, Water stand posts
	Bandhan – Dahelia	
	Alimod- Kurai	
	Alimod – Rorighat	
	Alimod – Jamundeep	
	Dhasai Nature walk	
2	**Adventure Zones**	Tourist holding area, and Ticket counter, Rest Rooms, Food Kiosks, Water Stand posts
	Sarangpur	
	Bargondi	
	Baruth	
3	**Camping Sites**	Tourist holding area and Ticket counter, Rest Rooms, Water Stand posts, Food Kiosks, Kitchen, Dining, Auditorium, Activity Areas
	Bandhan and Dahelia	
	Baruth	
	Kurrai	
	Dokrikheda	
	Ranipur -Tawanagar	
	Bhurabhagat	
4	**Museums & Interpretation Centres**	Tourist holding area, and Ticket counter, Rest Rooms, Food Kiosks, Water Stand posts
	Sarangpur	
	Dokrikheda	
	Bargondi	
5	**Stargazing at:**	

Sr. No	Proposed Tourism Activities	Suggested Tourism infrastructure Facilities
	Chaurasibaba temple	Tourist holding area and Ticket counter, Rest Rooms & Water facilities, Storage for devices for stargazing devices.
	Pathai	
	Bargondi	
	Kurrai	
	Handi-kho	

1.2.5.9 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- 31: 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- 32 : 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- 33 : 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- 34 : Dustbins

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

Figure 5- 35 : Changing Rooms

1.2.5.9.1 Tourism Supportive Infrastructure

Food stalls and souvenir kiosks is proposed near to gate of Safaris. At refreshment points 1 or 2 food stalls is proposed to avail food near to Parking facilities. A dustbin should be provided.

Figure 5- 36 : Food Kiosks

Accommodation

Accommodation for tourists are provided as per tourist zone and carrying capacity analysis. Major accommodation facility like resorts and eco cottages in wildlife area. While commercial hotels are proposed in Matkuli as it can be developed as counter magnet to Pachmarhi. There is no accommodation for tourist is provided in Alimod Baruth cluster apart from camping. The purpose to provide camping is to conserve the area for wildlife and forest. It is recommended that all the accommodation facility owner shall buy the fuelwood according to their need from Forest depo only. Only eco-friendly materials like bamboo, mud and other listed in green building LEED manual to be used to decrease the harm and bend with the nature. The proposed Accomodation in STR is proposed in Ranipur-Tawanagar, Mangaria, Kharpawad, Sarangpur, Tekapur Chaurmarhi, Pisua and Mehendikheda, Matkuli, Bhargondi, Bandhan, Sangakheda, Dhasai and Bardha.

1.2.5.10 Promotion of Tourism in STR

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. Pachmarhi is the brand image of Satpura. 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 STR. Local residents and local businesses should be involved in promotion. This will lead to get beneficial for both as tourism increases.

A state-based initiative like Buffer Mein Safar campaign launched by Madhya Pradesh Tourism Board with aim to attract more tourists to the National Parks and wildlife sanctuaries of Madhya Pradesh can helpful to boost the tourism.0 During the monsoon months from July to September the protected area of the forests is closed but the buffer areas of the forest remain open for exploration. The campaign will help to offer activities in buffer areas of Protected Areas including Wildlife Safaris, Bird Watching and other Eco-Tourism activities. Apart from the thrill of spotting various wildlife species in the buffer zones, the different hues of green cover is a feast to the eyes. These activities enthrall the tourist towards the beautiful wildlife of Madhya Pradesh. The campaign will be helpful to boost the tourism sector by offering specially designed tour packages mainly for 2 -3 nights and attracts tourists from the neighboring States for a weekend. A proper Tourism proposal plan linked with national as well as state plan to be prepared for STR. The tourism in STR 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 on 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 STR 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. Satpura 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

Pachmarhi has various training centres like teacher's training centres, forest training centres and army training centres. 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 Satpura to promote the local areas.

Conservation Education

Awareness programs for flora and fauna should be conducted on regular duration of 6 months for villagers, schools, guides and ground staff of STR. 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 STR should be provided. These can spread awareness in schools and other institutes as well as promotion of STR and tourism can be done through it. The training and awareness programs can be developed by EPCO and Bio-diversity boards. STR is proposed as management authority for workshops and awareness programs. Help from NGOs for spreading awareness and training.

1.2.6 RESEARCH, MONITORING AND TRAINING

1.2.6.1 Prioritization of Research and Monitoring

Biodiversity have been unique in these areas of Bhatodi and Chicha as it has been undisturbed. The animal movements can also be observed. The area of Chicha and Bhatodi are proposed for research locations. Other than that, Pachmarhi and Bargondi 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 STR and Non-objection certificate from state biodiversity board. The suggestive proposed locations are Bhatodi, Chicha, Pachmarhi and Bargondi.

1.2.6.2 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

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)
		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 and Local Body
4	Comercial Goat and sheep farming	Revenue Department and Local Body
5	Felling of Trees	Revenue Department, Local Body and Forest Department
6	Goat Farming	Local Body
7	Collection of Forest Produce or Non-Timber Forest Produce (NTFP)	Local Body
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 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, helicopter , drones , microlites	Revenue Department, Forest Department and Local Body
13	Protection of Hill slopes and river banks	Local body 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 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/Bio-medical 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

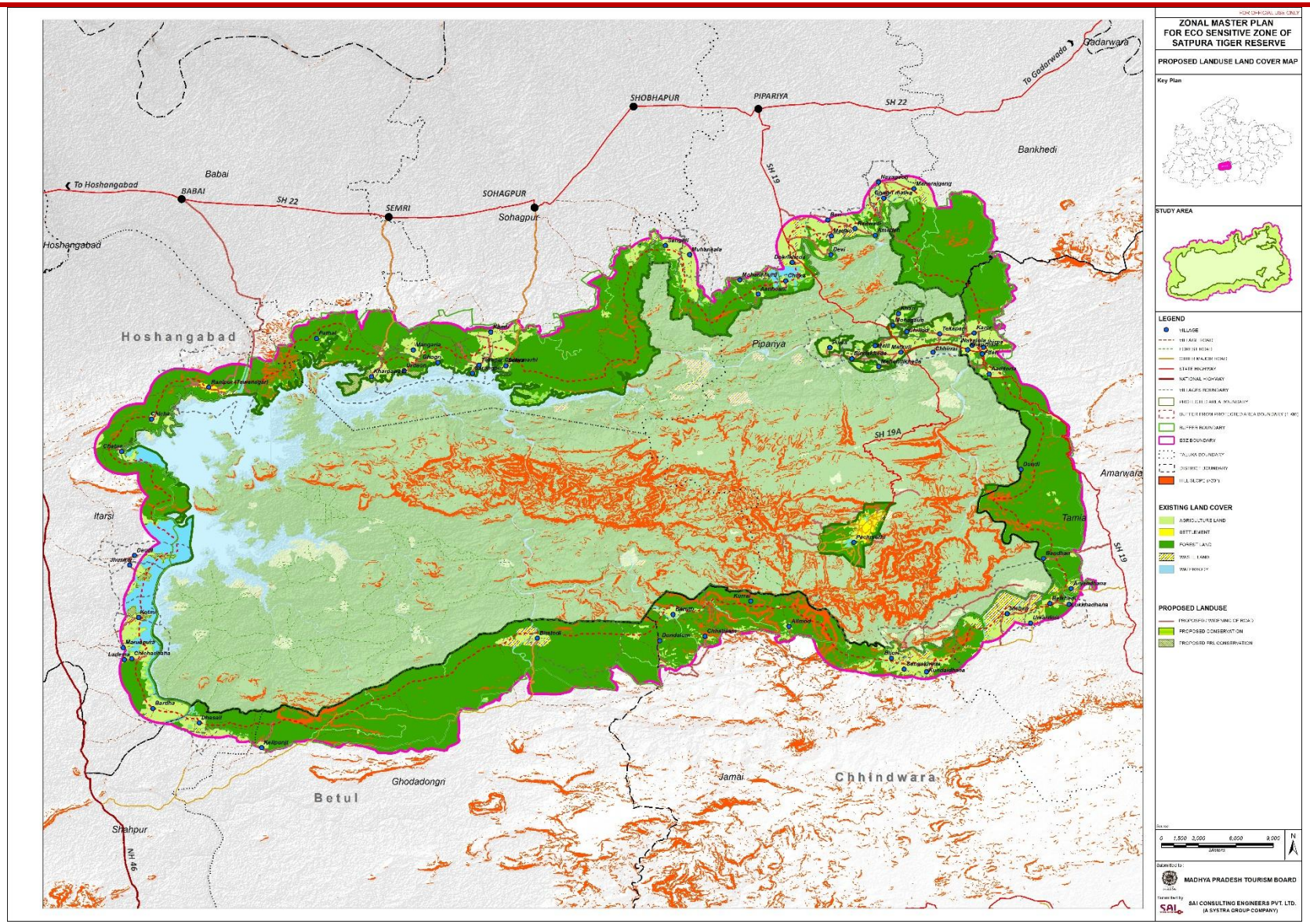


Figure 7- 1: Development, Conservation and Restricted Areas in ESZ

1.2.8 Phasing

1.2.8.1.1 Phase wise Priority of proposals

Approach for cluster-based proposals in Zonal Master Plan for Eco-Sensitive Zone of Satpura 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

1.2.8.1.2 Phasing interventions for tourism activities

Satpura 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 as below table.

Table 8- 1: Phasing interventions for tourism activities

Proposed Activities	Cluster	Location	Priority wise Phasing		
			Short Term	Mediu m Term	Long term
Nature Trails	Bargondi	Bargondi			
Nature Trails	Bandhan	Bandhan-Dahelia			
Nature Trails	Dasai	Churna			
Nature Trails	Alimod Baruth	Alimod-Kurrai			
Nature Trails	Alimod Baruth	Alimod-Rorighat			
Nature Trails	Alimod Baruth	Alimod-Jamundip			
Nature Trails	Ranipur-Tawanagar	Tawanagar to Chaurasi Baba			
Camping	Tawanagagr	Ranipur			
Camping	Dokrikheda	Dokrikheda			
Camping	Bargondi	Bargondi			
Camping	Bandhan	Dahelia			
Camping	Bandhan	Bandhan			
Camping	Nishan	Nishan			
Camping	Alimod Baruth	Kurrai			
Camping	Alimod Baruth	Baruth			
Adventure Activities					
Mountain Cycling and Mountain adventure activities	Tawanagagr	Chaurasi Baba			
Adventure activities hot air ballooning, archery, Burma bridge Mirror House, Human slingshot etc.	Parsapani	Mangaria			

Proposed Activities	Cluster	Location	Priority wise Phasing		
			Short Term	Mediu m Term	Long term
Adventure Activities like commando net, gearing wall, paintwall gun, free fall, multi vine, ladder climbing etc.	Parsapani	Sarangpur			
Water Sports based adventure activities	Dokrikheda	Dokrikheda			
ATV riding, Mountain based adventure activities	Bargondi	Bargondi			
ATV riding, Mountain based adventure activities, water-based adventure activities like river rafting, bamboo canoeing and many more.	Alimod Baruth	Baruth			
late evening Tourism	Parsapani	Pathai			
late evening Tourism	Bargondi	Bargondi			
Conservation of Tourist Sites	Tawanagagr	Step well of Rani & mata satyawati temple			
Conservation of Tourist Sites	Matkuli	Arjungufa			
Conservation of Tourist Sites	Pachmarhi	Begum Palace			
Conservation of Tourist Sites	Pachmarhi	Old and military church			

1.2.8.1.3 Phasing interventions for Development and Conservation Proposals

Development activities like livelihood through Traditional cropping, Tasar 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 STR	All Notified villages			
Speed Breakers	Whole STR	All Notified villages			

Proposals for Infrastructure	Cluster	Location	Tentative Phasing		
			Short Term	Medium Term	Long term
Fencing	Whole STR	All Notified villages			
Wildlife Passages	Whole STR	All Notified villages			
Silence Zone	Whole STR	All Notified villages			
Protection to The Source Of Water					
Surface Water	Whole STR	All Notified villages			
Ground Water	Whole STR	All Notified villages			
Rainwater Harvesting	Whole STR	All Notified villages			
Development of Resilience To Climate Change					
Promotion of Non-Polluting Mobility	Whole STR	All Notified villages			
Electric Vehicles for Safari	Parsapani Cluster	PARASAPANI			
	Bargondi Cluster	BARGONDI			
	Parsapani Cluster	Madhai			
Solar Energy	Whole STR	All Notified villages			
Biogas	Whole STR	All Notified villages			
Conservation of Night Sky	Whole STR	All Notified villages			
Measures for Pollution Control					
PUC Centre	Nishan	Nishan			
	Tawanagar cluster	Ranipur-Tawanagar			
	Parsapani cluster	Sarangpur			
	Matkuli-Jhirpa	Matkuli			
	Pachmarhi Cluster	Pachmarhi			
	Dhasai Cluster	Dhasai			
Noise Observatory and Measurement Centres	Tawanagar cluster	Ranipur-Tawanagar			
	Parsapani Cluster	Sarangpur			
	Matkuli-Jhirpa	Matkuli			
	Dhasai Cluster	Dhasai - Bardha			
	Bargondi Cluster	Bargondi			

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

1.2.8.1.4 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
Traffic and Transportation					
Proposal for Road Widening and Improvement of Roads	Alimod- Baruth				
Proposal for Road Widening and Improvement of Roads	Bandhan Cluster				
Proposal for Road Widening and Improvement of Roads	Bargondi Cluster				
Proposal for Road Widening and Improvement of Roads	Bhurabhagat Cluster				
Proposal for Road Widening and Improvement of Roads	Dhasai Cluster				
Proposal for Road Widening and Improvement of Roads	Dokrikheda Cluster				
Proposal for Road Widening and Improvement of Roads	Madho-Bori Cluster				

Proposals for Infrastructure	Cluster	Location	Tentative Phasing		
			Short Term	Medium Term	Long term
Proposal for Road Widening and Improvement of Roads	Matkuli-Jhirpa				
Proposal for Road Widening and Improvement of Roads	Pachmarhi Cluster				
Proposal for Road Widening and Improvement of Roads	Parsapani Cluster				
Proposal for Road Widening and Improvement of Roads	Pisua Cluster				
Proposal for Road Widening and Improvement of Roads	Tawanagar cluster				
Infrastructure for Traffic and Transportation					
Proposal for Bus Stop	Matkuli-Jhirpa	MATKULI			

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% based on 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>Drinking 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 programs in all the states except states in Northeast and Himalayas, 40% share is contributed by State Governments. In the case of Northeastern 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 incubates, 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 program 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	Entrepreneurship	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 whereas 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/ Cottage Industries	Deendayal Upadhyay Grameen Kaushal Yojana (DUGKY)	Ministry of Rural Development. 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).

<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 rowspan="2"></td><td rowspan="2"></td><td>Equity Grant Scheme</td><td rowspan="2">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</td><td>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 within 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.</td></tr>
<tr><td>Credit Guarantee Fund Scheme</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 Program (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 organizations (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 landowners. 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 Northeastern 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

As mentioned in the notification S.O.2538 (E), the Central Government has constituted a Monitoring Committee for a period of three years, for effective monitoring of the Eco-sensitive Zone, under sub-section (3) of section 3 of the Environment (Protection) Act, 1986 (29 of 1986). The monitoring shall comprise of, namely:

Table 9- 1: Proposed permissive Authority for Development regulations

Monitoring Committee		
1	Divisional Commissioner, Hoshangabad	Chairman;
2	Divisional Commissioner, Jabalpur	Member;
3	District Collector, Hoshangabad	Member;
4	District Collector, Betul	Member;
5	District Collector, Chinndwara	Member;
6	Superintending Engineer Public Works Department, Shahdol	Member;
7	Superintending Engineer Public Health Department, Hoshangabad	Member;
8	Superintending Engineer Public Health Department, Betul	Member;
9	Superintending Engineer Public Health Department, Chinndwara	Member;
10	Chief Executive Officer of District Panchayat, Hoshangabad	Member;
11	Chief Executive Officer of District Panchayat, Betul	Member;
12	Chief Executive Officer of District Panchayat, Chinndwara	Member;
13	Representative of the Town and Country Planning Department	Member;
14	Representative of the Pollution Control Board	Member;
15	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;
16	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;
17	Member, State Biodiversity Board	Member;
18	Field Director, Satpura Tiger Reserve,	Member Secretary.

1.2.9.2 Evaluation of Baseline Assessment Study (Part-1)

1.2.9.2.1 Stakeholder Consultation and Monitoring Committee meetings

A stakeholder consultation meeting for baseline assessment study of Eco Sensitive Zone of Satpura Tiger Reserve was scheduled by The Chairman of the monitoring committee with all other members of monitoring committee and other stakeholders on 4th October 2019 at Hotel Glen View, Pachmarhi.

The agenda of the meeting was to share this study with stakeholders and local people and getting feedback and inputs from them.

Inputs and feedback from the meeting are minutiae as follows:

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

Subject	**Minutes of the Meeting for stakeholder's consultation of baseline assessment study for Preparing Zonal Master Plan and Sub-Zonal Tourism Master Plan for Eco-Sensitive Zone listed in Cluster 4 (Satpura Tiger Reserve and Pench Tiger Reserve) of Madhya Pradesh**	
Meeting Date	4th October, 2019	
Place	Conference room, Hotel Glen View, Pachmarhi	
Participants	***From Stakeholder***	***From SAI Consulting Engineers Pvt. Ltd.***
	As per Annexure-1	Mr. Karn Joshi, Team Leader
		Mr. Kewal Rana, Urban Planner
		Mr. Jash Goswami, Urban Planner
		Dr. Satish Sharma, Forest Expert

S. No.	Points Discussed/suggestions made
1.	Team of SAI Consulting Engineers Pvt ltd – A Systra group Company presented baseline assessment study for Eco Sensitive Zonal Master Plan for Satpura Tiger Reserve at Hotel Glen View, Pachmarhi with monitoring committee chaired by The Divisional Commissioner, Hoshangabad. Presentation given by the team of SAI Consulting Engineers, is attached herewith in annexure-2 for reference.
2.	It was discussed in the meeting to consider the boundary, area and villages of Eco-Sensitive zone (ESZ) as per the Notification no. S.O. 2538 (E) for further study.
3.	Divisional Commissioner Sir have asked to mention source of the data received from respective departments in the presentation.
4.	Divisional Commissioner Sir have suggested concerned government departments to study the presentation given by SAI Consulting Engineers Pvt. Ltd. in order to identify lack of infrastructure facilities in villages of ESZ to promote tourism which will finally lead to generate employment in the region.
5.	The Collector, Hoshangabad asked consultant to incorporate identification and conservation of endangered species in the area. Also, the Collector suggested to show landmarks near identified potential developable land.
6.	Stakeholders have demanded copy of the presentation for their study and demanded 15 days for giving their suggestions and inputs for the project.
7.	Stakeholders are more concerned about tourism development in Pachmarhi and Madhai area. Suggestions from Stakeholders: For creating employment opportunities: • Development and promotion of non-polluted Agro based industries in ESZ and surrounding area. • Community based development programs • Development of Haat bazar and linking it with tourism in order to promote local products • Development of affordable accommodation facilities in Madhai area For promoting tourism: • Development and promotion of water sports activities in Tawa dam and other river area of STR • Development and promotion of rural homestays concept in STR

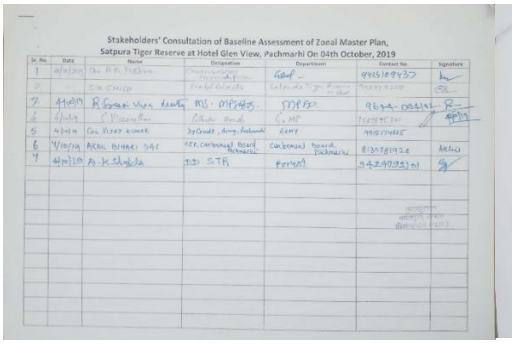
Preparation of ZMP for ESZ for Cluster 4 MP - **Minutes of the Meeting**

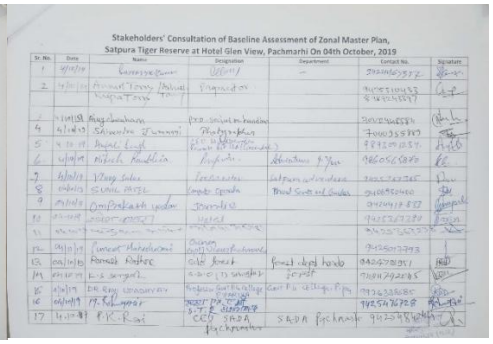
	• Beautification of the villages and roads lying on entry points of STR. I.e., Road to Pachmarhi, Madhai, Churna etc • Improving nightlife in Pachmarhi area by promoting cultural and other activities • Development of Air-strip in Pachmarhi to attract more foreign tourists • Promotion of herbal medicines through herbal spa, naturopathy club etc. • Promotion of activity based tourism in the region.
8.	Looking at the geological aspect of the Pachmarhi area, research center or exhibition center should be opened in order to spread awareness regarding geological importance of the area.
9.	Stakeholders have appreciated the identified potential of tourist spots and promotion of theme wise tourism in the region. Along with development of thematic gardens in Pachmarhi area for promotion of endangered spices and unique species of STR.
10.	Stakeholders have appreciated the ideas of nature walk; canopy walk and development of natural trails in buffer area of STR. Also, many stakeholders have suggested to develop jungle safari routes through core area to buffer area of STR
11.	Stakeholders are more emphasizing on development of tourism with PPP model or Private partnerships.
12.	Proposal to be prepared to minimize the issue of open defecation during Nagdwari & Shivratri mela. As well as to streamline solid waste management in the villages of ESZ
13.	Some of the stakeholders have suggested that some priority and concessions should be given to the residents of the villages encompassing in ESZ for promoting development. Rules and regulations for any kind of development should not be the same for local people and people coming from outside area.
14.	Stakeholders have also suggested to propose a sports recreation center or sports complex at different locations of the region to promote sports activities for tourists as well as local people.
15.	Stakeholders suggested to create revenue generation-based model for development of Pachmarhi.
16.	The Field Director, STR have also suggested some routes that are shown in the presentation needs to be altered and also suggested potential area for tourism development.

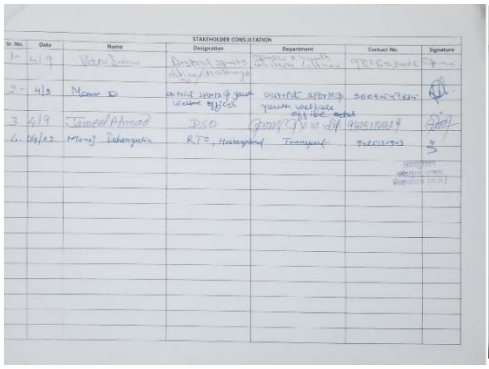
The meetings ended with vote of thanks.

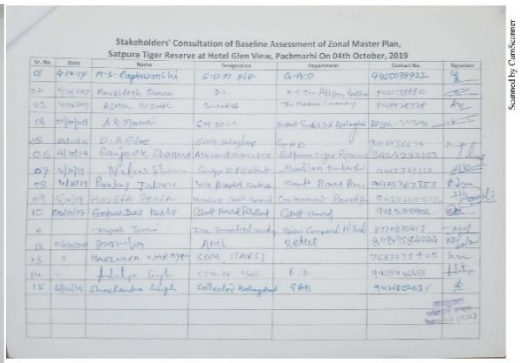
18/10/19
Commissioner
Narmadapuram

Attendance Sheet of stakeholder consultation meeting:


Stakeholders' Consultation of Baseline Assessment of Zonal Master Plan,
Satpura Tiger Reserve at Hotel Glen View, Pachmarhi On 04th October, 2019


Stakeholders' Consultation of Baseline Assessment of Zonal Master Plan,
Satpura Tiger Reserve at Hotel Glen View, Pachmarhi On 04th October, 2019




Stakeholders' Consultation of Baseline Assessment of Zonal Master Plan,
Satpura Tiger Reserve at Hotel Glen View, Pachmarhi On 04th October, 2019

photographs from the stakeholder's consultation meeting:

1.2.9.2.2 Evaluation Committee meetings by Madhya Pradesh Tourism Board

The Evaluation committee meeting was held on date 12th February 2020 at office of Madhya Pradesh Tourism Board, Bhopal. Following members were present during the meeting:

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

मध्यप्रदेश टूरिज़्म बोर्ड
Madhya Pradesh Tourism Board

Madhya Pradesh Tourism Board

Jahangirabad, Bhopal

Date- 16th March 2020

Minutes of Meeting

Please find enclosed herewith duly approved minutes of Evaluation Committee meeting held on 12.02.2020 for 'Preparation of Zonal Master Plan for Eco-Sensitive Zones of M.P.' for information and necessary action.

Managing Director

To,

1. Dr. Amit Gajbhiye, Joint Director, Directorate of Town and Country Planning, Bhopal
2. Mr. Rajnish Kumar Singh, Dy. CCF, Wildlife, Bhopal
3. Mr. Sanjeev Sachdev, Chief Scientific Officer, EPCO Bhopal
4. Mr. Swarn Pant (Nodal Officer), Consultant, MAP-IT Department, Bhopal
5. Mr. S K Singh, Field Director, Satpura National Park, Hoshangabad, M.P.
6. Mr. A.K Mishra, Field Director, Sanjay National Park, Son Ghariyal Wildlife Sanctuary and Badgara Wildlife Sanctuary, Sidhi, M.P.
7. Mr. Madhu V Raj, Divisional Forest Officer, Jeevashm National Park, Dindori, M.P.
8. Mr. Virendra Kumar, Sr. Vice President, M/s Feedback Infra Pvt. Ltd., Gurugram
9. Mr. Karn Joshi, Team Leader, M/s Sai Consulting Engineers Pvt. Ltd., Ahmedabad
10. Mr. Vineet Trivedi, Manager, M/s IPE Global Ltd., New Delhi.

Managing Director

1. **Presentation by M/s Sai Consulting Engineers Pvt. Ltd on Satpura National Park (Cluster-4)**

Sai Consulting Engineers Pvt. Ltd made a presentation on the Baseline study report of Satpura National Park of Cluster-4. The Evaluation committee members gave their inputs and suggestions on what can be further included in the report and how the analysis of the data can be improved so that the recommendations in the Zonal Master Plan which they will include while preparing draft master plan can be effective.

The Evaluation Committee recommended that:

a. Faults and fractures data with map need to be added in the report for effective analysis.
b. Type of waste land is to be defined in the land cover map of Satpur National Park.
c. Demographic data is insufficient, more data needs to be added like child mortality rate.
d. Land value analysis is very important and needs to be done.
e. Carrying capacity analysis has to be done while keeping in mind to utilize its optimum capacity.
f. Data from the environmental department i.e., EPCO has not been included so far which is important. It is suggested to contact EPCO and take required data from there.
g. Land Suitability analysis has to be done.

Following points are missing in the Baseline study report submitted to MPTB. These points were discussed in the meeting and evaluation committee suggested to include it in the report:

a. Maps are not clearly visible. Scale of the map should be 1:4000.
b. Detailed methodology is not mentioned in the report.
c. Mention coordinates of the ESZ boundaries (at least 6-8 coordinates).
d. Waterbodies, watershed map not clear enough.
e. Drainage map needs to be included.
f. Mineral deposit data has to be included
g. Land use and planning legislation has to be included.
   - Existing Planning framework
   - Legislative framework
   - Its observation and inferences
h. Way forward: Master planning
i. Overall SWOT analysis.

Note- Some of the above-mentioned points were included in the presentation but were missing from the report. Please include all the above-mentioned points in the report also.

All the above-mentioned points that are suggested by the evaluation committee members have to be incorporated in the report. Two hard copies of the revised baseline study report have to be submitted to MPTB and softcopy of the report has to be mailed by the consultant.

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

1.2.9.3.1 Stakeholder Consultation and Monitoring Committee meetings

The submission of Draft Zonal Master Plan of ESZ of Satpura Tiger Reserve to The Divisional Commissioner, Narmadapuram Division, Hoshangabad was done vide our letter no. [SAI/BAUP219009/HO/0966/2020] dated 30th June 2020. After submission of the report, as directed by the Divisional Commissioner Sir, the same report has been submitted to the key stakeholder and notified monitoring committee individually through email for their review, suggestions and comments. The submission letters are enclosed in the annexure 17.1.

Majority of the stakeholders have given their comments and suggestions (comments are enclosed in annexure 17.2) as mentioned in table below:

Table 9- 2: Comments/suggestions received from various stakeholders

Sr No	Designation of Authorized Stakeholder (Letter No.)	Received Comments	Remarks on Comments
1	The Field Director, Satpura Tiger Reserve, Hoshangabad (5169) Date: 15/07/2020	Table No 6-1: A- Wild-life tourism zone Khamada- No. of tourist is in carrying capacity for safari and camping in 407, It is on higher side as no infrastructure can support more than 200 tourists otherwise it will create nuisance to wildlife.	Incorporated
		Table No 6-1: B - Recreational zone 1. Estimation of Dokrikheda and Tawanagar are too high. The population around and estimated in flux from neighboring areas could not meet this number. Socioeconomic status and infrastructure development does not permit that huge number	Incorporated
		2. At Tawanagar cruise & House boating is proposed by MPT, cruise is plying in Tawa Reservoir at present.	Incorporated
		Table No 6-1: C - Natural Heritage Tourism 1. Alimod - Baruth - Rethink about ropeway where it will be installed also keep site distance in mind	Noted. A feasibility study and Detailed Project Report (DPR) to be carried out for both proposed sites.
		Table No 6-1: D - Commercial No Accommodation is available on all three sites (As per discussion Satdhara, Dodhara and Arjun Gufa). Do you consider accommodation at Matkuli?	Yes. Matkuli is proposed for commercial activities and an accommodation hub for Pachmarhi as well as surrounding locations.
		Under para 6.3 At many places, tourist facilities as lounge rest room (Toilet and Bathroom are separately mentioned) Auditorium are suggested. No permeant structure can be created on forest land under eco-tourism guidelines. temporary structures can be provided with reusable materials.	Incorporated
		Section - 7.5 Page 45 Industrial Area can be developed at Bagra also being rail head and near to Babai an important Agri based market.	Suggested location falls outside the ESZ boundary.
		Para 8.2 forest and Biodiversity Table - 8.1 3 - Encroachment - it is dealt under India Forest Act 1972 not in FCA 1980 for forest land and under land revenue code for revenue land.	Incorporated

Sr No	Designation of Authorized Stakeholder (Letter No.)	Received Comments	Remarks on Comments
2	The Chief Executive Officer (2002) Date: 17/07/2020	Also inculcating on the cultural bent, one important Mahadev mela (in month of February) is also falls in this area in Sangakhera; so, it should consider that some economical activities also be taken place.	Already Proposed in chapter 12: Livelihood issues.
		Whole this area is in high in altitude, one or more waterfalls are there. it can be developed as Mansoon Destination. And hub of Eco and agro tourism. Please consider some business opportunity for the local tribal fellow.	Already Proposed in chapter 13: Eco-tourism, interpretation, and conservation education – sub zonal tourism master plan.
		Through SRLM some women groups also working on the collection of NTFP produces, we are also in the process to build their capacity in processing and marketing.	Already Proposed in chapter 12: Livelihood issues.
		In master planning we should also consider the activities of upliftment of the economy of local people. They ought to be part of tourism activity as tourist guide, home staying, local herbal therapy spiritual healing, and through folk art and craft.	Already Proposed in chapter 12: Livelihood issues and chapter 13: Eco-tourism, interpretation and conservation education – sub zonal tourism master plan
		There must be one open in Bori wildlife sanctuary somewhere at Kukarpani as district also can explore the opportunities of whole.	Noted. Need to explore opportunities as per guidelines of NTCA and discussions with appropriate authority.
3	The District Collector	As per discussion vide dated 24/07/2020 with the District Collector Office, suggestions received from the Chief Executive Officer (Jilla Panchayat, Chhindwara District) should be considered suggestions from District Collector (Chhindwara District) as the CEO, Jilla Panchayat is the responsible authority to give suggestions regarding all the components covered in Draft Zonal Master Plan	Noted and incorporated
4	The Chief Executive Officer	The letter suggests taking suggestions from STR, which are already received from STR vide letter no 5169 dated 15/07/2020	Noted and incorporated

5	The Executive Engineer, PHED, Betul	The Executive Engineer provides the approval to the Draft Report and suggests incorporating the ground recharge measures.	Noted and incorporated In Chapter 11.

All the comments received from local stakeholders/ monitoring committee are incorporated in Draft Zonal Master Plan report and maps. Comments from Evaluation Committee including state board members and MPTB will be incorporated subsequently.

Stakeholder consultation meeting and Monitoring committee meeting for presentation of Draft Zonal Master Plan and Sub Zonal Tourism Master Plan of Eco Sensitive Zone of Satpura tiger Reserve has been organised at office of the Divisional Commissioner (Narmadapuram division), Hoshangabad vide letter no. 6273/revenue/2020 dated 06/11/2020. The comments/ Minutes of Meeting received from the Divisional Commissioner is as below:

Table 9- 3: Comments/suggestions received during stakeholder consultation meeting

Sr	Comments	Remarks
1	Circuit Road of 12m width all around ESZ is not required and needs funding and various permissions. It is better to propose wherever its required.	Noted. Roads have been changed to 9 m widening and only proposed wherever it is required.
2	Master Plan must include check list and monitoring mechanisms to monitor all the Prohibited, Regulated and Promoted activities as per the Gazette notification of ESZ. The check list will help the monitoring committee to monitor various activities in the ESZ as per the notification.	The checklist has been incorporated in sections of 10.7 to 10.9 in Chapter 10 The strategies
3	List of best of eco-friendly practices of various development departments may be listed, so that it can be promoted in the ESZ in their respective annual plans.	Conservation measures for Forest like Bio-diversity parks, Butterfly and Flower park, Botanic Park and Herbal Park in section – 10.6.1. Riparian Buffer for surface water conservation and Ground water recharge methods with rain water harvesting practices in section 11.14, Conservation of soil, restriction of construction activities on slopes > 20 degree hills in section 11.2 Conservation of night Sky in section 11.15.5 measures for Pollution like establishment of monitoring station, promoting the non-conventional energy sources and E-vehicles for Safari in STR are briefly explained in section 11.15.6.
4	Thematic maps and plans on common wastelands, waterbodies, revenue forests, heritage sites etc, may be prescribed in the master plan.	All existing thematic maps including wastelands, waterbodies, revenue forests, heritage sites are already covered in Baseline Assessment Study. Further we are attaching herewith Baseline study maps of said components for your ready reference.
5	Mitigation measures for linear infrastructure as per MOEF&CC and Wildlife Institute of India should be prescribed to reduce man-animal conflict	Mitigation measures for linear infrastructure are proposed as per guidelines by MOEF&CC and Wildlife Institute of India as mentioned in Chapter 11 Section-11.10.

Sr	Comments	Remarks
	and easy movement of wildlife in the ESZ and Corridor areas.	
6	Permissible various pollution norms and standards as per central and state level guidelines and mitigation measures may be listed so that it can be monitored in the ESZ	Noted. Incorporated in Annexure – 7.1. The mitigation measures for Pollutions are briefly discussed in Section 11.15.6.
7	Only the Eco-tourism Zones in ESZ must be demarcated, and not in the protected zone of STR. Various activities of eco-tourism in the ESZ shall be implemented as per NTCA Eco-tourism guidelines. List of possible eco-tourism activities may be prescribed in the plan.	Noted. There are no Proposals given in protected Zone of STR. Chapter - 10 (The Strategies) and Chapter - 13 (Eco-Tourism, Interpretation Center and conservation education – Sub zonal Tourism Master Plan) includes note for development criteria for various activities of eco-tourism in the ESZ shall be implemented as per NTCA Eco-tourism guidelines. Eco-Tourism clusters has been demarcated as per figure no. 13.2 and briefly explained in Section- 13.2. The activities have been detailed out in Section – 13.3.
8	Carrying capacity of Tourism for the protected area of STR is already approved in the Tiger Conservation Plan (TCP) by NTCA, hence no need to calculate it and it is not in the scope of the consultant.	Carrying Capacities are calculated as per NTCA guidelines for the tourism zones of Eco-Sensitive Zone only and not for protected area of STR. The carrying capacity is applied when the potential of all the designated tourism zone is realized. However, the forest department can restrict or release the number of tourists as per NTCA guidelines. Carrying Capacities are calculated only for ready reference.
9	Good solid waste management plan for especially Pachmarhi, Madhai, Matkuli and other villages of ESZ must be included in the plan.	Solid Waste management is briefly explained for notified villages in section 11.6 Solid and Liquid Waste Management of Chapter 11. Cluster wise Solid Waste Management map can be referred in Figure no. 11.50.
10	List of possible livelihood activities and various skill up-gradation trainings can be included in the plan.	Possible livelihood activities are mentioned in Section-12.2 Agriculture Section 12.4 - Tussar Activities Section 12.3.3 - Agro Forestry Section 12.3.4 Minor Forest Produces Section 12.4.1 - Agro Industries Section – 12.4.2 - Household Industries Section – 12.3.5 Animal Husbandry and Poultry Section 12.4.3 - Agro-based Tourism activities
11	Keeping the corridor value and dispersal pattern of wildlife, "No Go" areas may propose for the movement of wildlife from STR to other landscapes.	Noted. Mitigation measures for linear infrastructure are proposed as per guidelines by MOEF&CC and Wildlife Institute of India as mentioned in Chapter 11 Section-11.10

Sr	Comments	Remarks
12	As per the notification no new construction of hotels and resorts shall be allowed within 1km from the boundary of Protected Area, hence clear demarcation of the same on the map and list of villages should find in the plan to monitor.	The Consultant have made note of it while providing proposals in ESZ area. No new construction of hotels and resorts are proposed within 1 km from boundary of Protected Areas. Describing the same we have incorporated the map in Figure no. 10.44 of Chapter -10.

Figure 9- 1: Meeting related to STR as per notification

1.2.9.3.2 Evaluation Committee meetings by Madhya Pradesh Tourism Board

The Evaluation committee meeting was held on date 4th February 2021 at office of Mahdya Pradesh Tourism Board, Bhopal. Following members were present during the meeting:

Mr. H. S. Negi, Addl. PCCF, Wildlife, Bhopal

1. Dr. Amit Gajbhiye, Joint Director, Directorate of Town and Country Planning, Bhopal
2. Mr. Sanjeev Sachdev, Chief Scientific Officer, EPCO Bhopal
3. Mr. V. Venugopal (Nodal Officer), Manager GIS, MAP-IT Department, Bhopal
4. Mr. L. Krishnamoorthy, Field Director, Satpura National Park, Hoshangabad, M.P.
5. Mr. Akshay Rathod, Divisional Forest Officer, Dinosaur National Park, Dhar, M.P.
6. Mr. Harishankar Manjhi, Divisional Forest Officer, Narsinghgarh Wildlife Sanctuary, Rajgarh, M.P.
7. Mr. Vijay Kumar, Divisional Forest Officer, Ratapani National Park and Singhori Wildlife Sanctuary, Obedullaganj, M.P.
8. Mr. Karn Joshi, Team Leader, M/s Sai Consulting Engineers Pvt. Ltd., Ahmedabad

The Minutes of Meetings of the same is as below.

Madhya Pradesh Tourism Board

Bhopal

Date- 4th March 2021

Minutes of Meeting

Please find enclosed herewith duly approved minutes of Evaluation Committee meeting held on 04.02.2021 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 National Park, Hoshangabad, M.P.
6. Mr. Akshay Rathod, Divisional Forest Officer, Dinosaur National Park, Dhar, M.P.
7. Mr. Harishankar Manjhi, Divisional Forest Officer, Narsinghgarh Wildlife Sanctuary, Rajgarh, M.P.
8. Mr. Mr. Vijay Kumar, Divisional Forest Officer, Ratapani National Park and Singhori Wildlife Sanctuary, Obedullaganj, M.P.
9. Mr. Karn Joshi, Team Leader, M/s Sai Consulting Engineers Pvt. Ltd., Ahmedabad
10. Mr. Kaustubh Kurlekar, Manager, Sr. General Manager, M/s Aakar Abhinav Consultants Pvt. Ltd., Mumbai.

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 04.02.2021 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 National Park only)
7. Mr. Jairaj Singh Rathore, Supdt., Narsinghgarh Wildlife Sanctuary, Rajgarh, M.P. (for Narsinghgarh Wildlife Sanctuary only)
8. Mr. Pradeep Tripathi, Supdt., Ratapani National Park and Singhori Wildlife Sanctuary, Obedullaganj, M.P. (for Ratapani National Park and Singhori Wildlife Sanctuary 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
4. Mr. Parikshit Vala, GIS Expert
5. Dr. Satish Kumar Sharma, Forest Expert

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/ Wild life Sanctuaries of M.P.' and they provided their inputs and suggestions.

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 Draft Zonal Master Plan report of Satpura National Park of Cluster-4. The Evaluation committee members gave their inputs and suggestions.

The Evaluation Committee recommended that:

1. Budget- Include budget chapter in the report (The plan budget, Source of funding and drawing and disbursing mechanism) and mention in the report that budget is indicative.
2. Mention short term and Long-term objectives.
3. Existing Land use and land cover- Decrease in forest area- Share and discuss with F.D. Satpura.
4. Mention sources wherever necessary. Also write references.
5. For upgradation of roads, mitigation measures have to be followed. For this, list of roads in ESZ shall be shared with other govt. departments.
6. In case of Tiger Reserve, connecting area has to be kept intact.
7. In proposal for traffic and transportation, road closures should not be proposed.
8. In proposed Land use and land cover proposal, Recreational Zone can be renamed as Buffer Tourism Zone, e.g, Tawa Tourism Zone.
9. Change 'Gamtal' to any other known name.
10. Identify level of streams like Level- I stream, Level- II stream.
11. For reduction in green area (Agricultural area) in land use map, conversion of agricultural land to developable land- mention a note, write provision for its explanation.
12. Mention method of projection.
13. For development of rural areas, urban development guidelines should not be implemented. Ground coverage, permissible height, etc., should not be proposed for rural residential areas.
14. Country planning guidelines can be proposed for development of rural residential areas. Soft guiding principles has to be proposed– Discuss with Dr. Amit Gajbhiye.
15. Commercial activities can be guided by development guidelines.
16. Carrying capacity calculation and its factors will be different for urban and rural areas. Methodology of Carrying capacity will be totally different for ESZ. Change calculations for carrying capacity of ESZ and discuss whether Carrying capacity calculation is at all needed or not.- Discuss with Dr. Amit Gajbhiye and F.D. Satpura
17. Relatable/ realistic photos have to be used for representation of any proposal.
18. Proposed activities in 'Churni' should be shifted to Chhindwara side.
19. Proposal for ropeway has to be removed as it is not accessible.
20. Interpretation center is to be added in 'Strategies for promotion'.
21. Rainwater harvesting should be proposed for commercial and not for residential in rural areas.
22. Plastic control/ management should be proposed in Pachmarhi area.

23. Name/ List of agency or Indian govt. scheme for Implementation of proposal for conservation of dark sky.
24. Promotion of non-conventional energy sources can be done in Madhai, remove Bhatodi area.
25. Govt. schemes have to be mentioned for promoting activities (in Sub Zonal Tourism Master Plan) so that they can be implemented on ground.
26. Hawking and street vending should also be added in the proposed framework for reviving the traditional crops in the villages of ESZ.
27. Churni and Nishan should be connected for promotion of crops- Agroforestry
28. Poultry farming- Include Kadaknath breed in poultry farming.
29. Agro Industries in Agro Tourism- Highlight that it is in regulated activities.
30. Proposal for Solid waste management- Processing of solid waste on site is recommended instead of transferring solid waste from one point to another. - Take plan from Mr. Prashant Baghel
31. Solid waste management plan has to be included.
32. In proposed water supply scheme, cluster approach may not be feasible.
33. Institutional Framework and Capacity Building- Framework will be discussed with Divisional Commissioner.
34. Rural Tourism- Include Homestays. Take details of tourism product and homestays from Rural Tourism Dept. MPTB.

Important points to note:

1. Restructure the chapters/ template according to draft guidelines by MoEFCC.
2. After incorporating comments of evaluation committee meeting, chapters related to other govt. departments like agriculture is to be send to the respective departments for their comments which is again to be incorporated in the report- Keep 15 days timeline for receiving comments from other departments.
3. After incorporating comments from different govt. departments, updated Zonal Master Plan report has to be submitted to MPTB.
4. Evaluation committee meeting for the updated Draft Zonal Master Plan report of Satpura Tiger Reserve will be planned for 1st week of March'21.

All the above-mentioned points that are suggested by the evaluation committee members have to be incorporated in the report. Two hard copies of the revised 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.

Table 9- 4: Compliance report for Draft Zonal Master Plan

Compliance for comments received during Evaluation Committee Meeting for Draft Zonal master Plan report of ESZ of STR on 23/03/2021		
Sr No	**Comments/ Suggestions from Evaluation Committee**	**Remarks**
1	Provide hard copies to all the EC members for their inputs. Comments received within 10 days have to be incorporated in the report.	The hardcopies were provided to EC members vide following letter no. SAI/BAUP219009/HO/0476/2021 to The APCCF, Wildlife, MP and The Additional Managing Director, MPTB Hardcopy is handed over personally to The Field Director, STR SAI/BAUP219009/HO/0530/2021 to The Chief Scientific Officer, EPCO SAI/BAUP219009/HO/0529/2021 to The Joint Director, TCPO
2	Consultant must 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.	Noted. The chapters have been shared to Madhya Pradesh Tourism Board vide letter no SAI/BAUP219009/HO/0521/2021 dated 1/04/2021.
3	Land use / Land cover must be checked & to be discussed in detail with F.D' Satpura. Presentation must be done in presence of F.D. Satpura in LAC meeting to concerned stakeholdersin Pachmarhi	Noted. 1. LULC has been finalised after frequent discussions with the Field Director, STR during site visits on: i. 08/03/2020 ii. 16/09/2020 iii. 30/09/2020 2. Discussion with LAC, stakeholders & Hotel Association regarding ZMP on 19/11/2019, 04/10/2019 and 06/11/2020 (MoM enclosed in annexure 2.3, section 17.2.1 & 17.3.1 of ZMP report respectively) 4. Communication with Mr. Kamal Dhut (Paryatan Mitra, NGO- Pachmarhi) regarding suggestions on Zonal Master Plan for ESZ of STR via E-mail dated 19.12.2019 and 24.01.2020. 5. Comments from the Field Director, STR is received on 04/05/2021. Minutes for the same is recorded and circulated as per annexed herewith.
	Important Points to Note	
1	Final ZMP has to be submitted in Hindi also. (2 copies)	Noted. ZMP will be submitted in Hindi after final approval from MPTB & other stakeholders

Compliance for comments received during Evaluation Committee Meeting for Draft Zonal master Plan report of ESZ of STR on 23/03/2021		
Sr No	**Comments/ Suggestions from Evaluation Committee**	**Remarks**
2	Hard copies of the reports are to be provided to all the Evaluation committee members for their inputs.	The hardcopies were provided to EC members vide following letter no. SAI/BAUP219009/HO/0476/2021 to The APCCF, Wildlife, MP and The Additional Managing Director, MPTB Handed over personally to The Field Director, STR SAI/BAUP219009/HO/0530/2021 to The Chief Scientific Officer, EPCO SAI/BAUP219009/HO/0529/2021 to The Joint Director, TCPO
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.	Noted and data is incorporated in section-13.2.4 of chapter 13
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.	Noted.
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.	Noted. Carrying capacity is calculated as per MoEFCC method and was reviewed and approved by the Field Director, STR
6	Restructure the chapters/ template according to draft guidelines by MoEFCC	Restructured report as per draft guidelines by MoEFCC is already submitted

1.2.9.3.3 Evaluation Committee Meeting for Draft Zonal Master Plan 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.

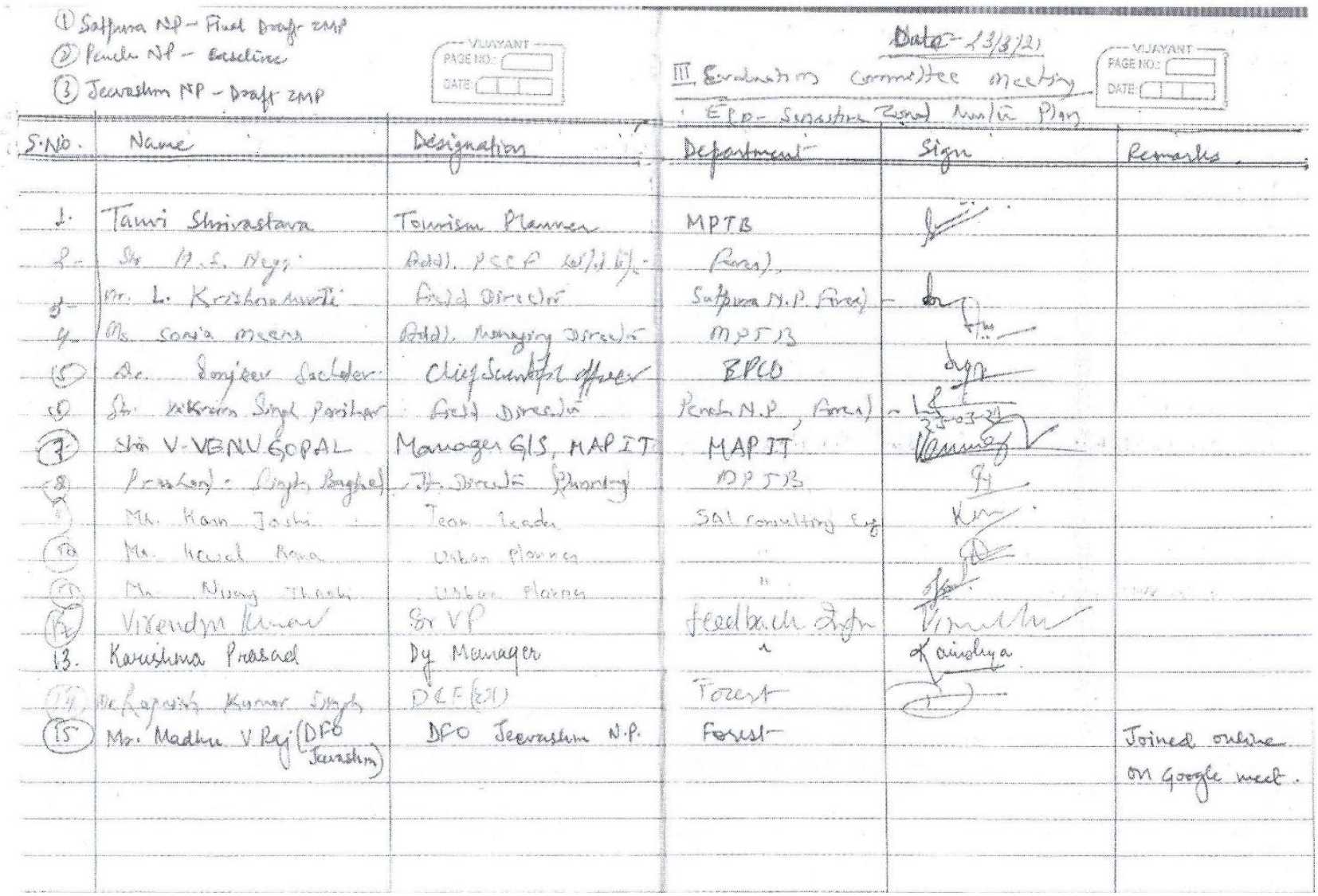
The Evaluation Committee recommended that:

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.



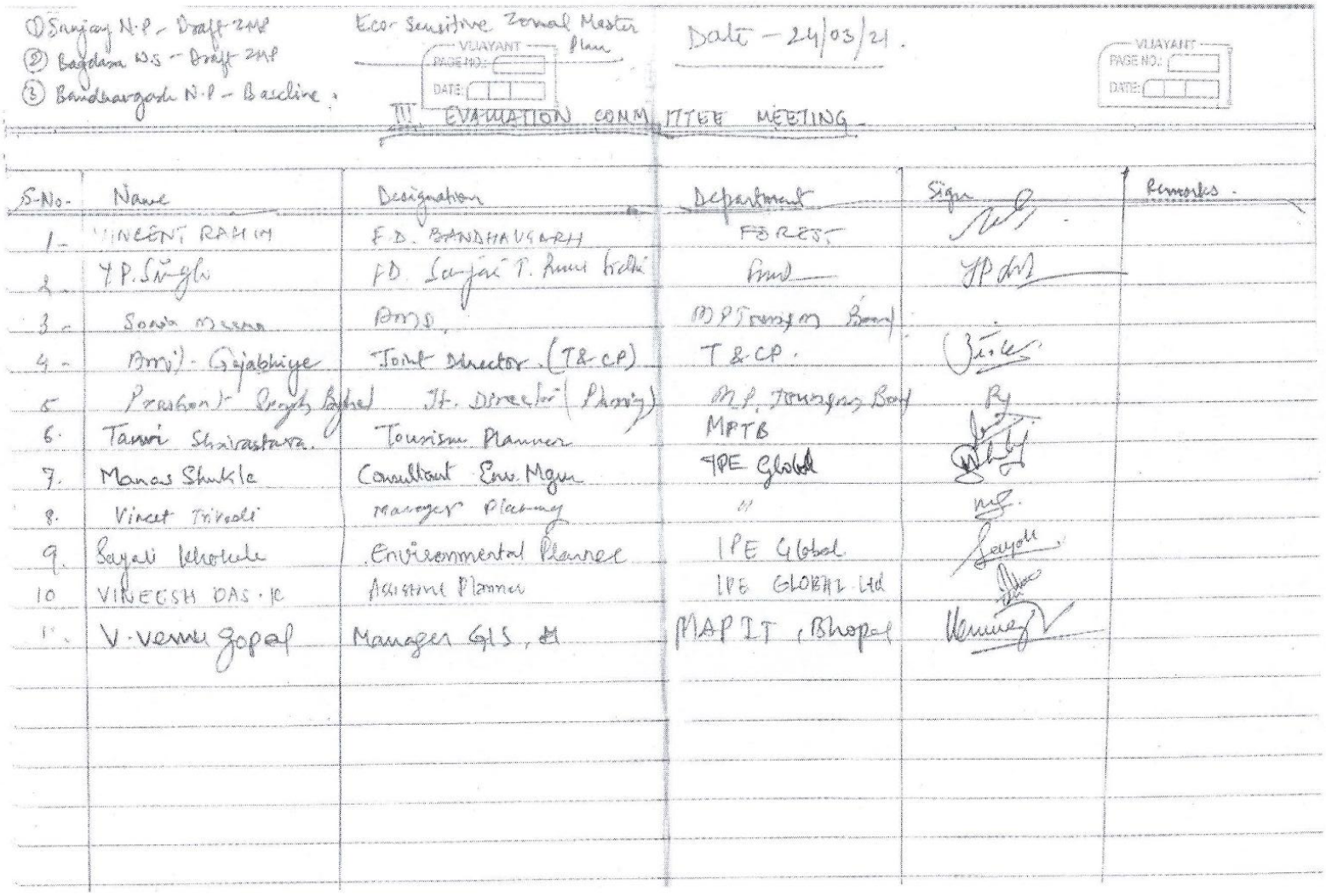
① Satpura NP – Final Draft ZMP
② Pench NP – Baseline
③ Seoni NP – Draft ZMP

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. [illegible]	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. Nirraj Thakur	Urban planner	"		
12.	Virendra Kumar	Sr VP	feedback infra		
13.	Karishma Prasad	Dy Manager	"	Karishya	
14.	Mr. Rajesh Kumar Singh	DCF (ZP)	Forest		
15.	Mr. Madhu V. Raj (DFO Tourism)	DFO Seoni N.P.	Forest		Joined online on Google meet.



1) Sanjay N.P. – Draft ZMP
2) Bagdara W.S – Draft ZMP
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.	Brij J. Gajabhiye	Joint Director (T&CP)	T&CP.		
5.	Prashant Singh Rajput	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 Ichhole	Environmental Planner	IPE Global		
10	VINEESH DAS. P	Assistant Planner	IPE GLOBAL Ltd		
11.	V. Venu Gopal	Manager GIS, M	MAP IT, Bhopal		

Table 9- 5: Compliance Report- Evaluation Committee Meeting

Compliance for comments received during Evaluation Committee Meeting for Draft Zonal master Plan report of ESZ of STR on 23/03/2021		
Sr No	**Comments/ Suggestions from Evaluation Committee**	**Remarks**
1	Provide hard copies to all the EC members for their inputs. Comments received within 10 days have to be incorporated in the report.	The hardcopies were provided to EC members vide following letter no. • SAI/BAUP219009/HO/0476/2021 to The APCCF, Wildlife, MP and The Additional Managing Director, MPTB • Hardcopy is handed over personally to The Field Director, STR • SAI/BAUP219009/HO/0530/2021 to The Chief Scientific Officer, EPCO • SAI/BAUP219009/HO/0529/2021 to The Joint Director, TCPO
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.	Noted. The chapters has been shared to Madhya Pradesh Tourism Board vide letter no SAI/BAUP219009/HO/0521/2021 dated 1/04/2021.
3	Land use / Land cover must be checked & to be discussed in detail with F.D' Satpura. Presentation must be done in presence of F.D. Satpura in LAC meeting to concerned stakeholders in Pachmarhi	Noted. 1. LULC has been finalized after frequent discussions with the Field Director, STR during site visits on: i. 08/03/2020 ii. 16/09/2020 iii. 30/09/2020 2. Discussion with LAC, stakeholders & Hotel Association regarding ZMP on 19/11/2019, 04/10/2019 and 06/11/2020 (MoM enclosed in annexure 2.3, section 17.2.1 & 17.3.1 of ZMP report respectively) 3. As per telephonic conversation with the Field Director, STR latest on 22/04/2021, anticipating comments from him by 30/04/2021
	<u>Important Points to Note</u>	
1	Final ZMP has to be submitted in Hindi also. (2 copies)	Noted. ZMP will be submitted in Hindi after final approval from MPTB & other stakeholders
2	Hard copies of the reports are to be provided to all the Evaluation committee members for their inputs.	The hardcopies were provided to EC members vide following letter no. • SAI/BAUP219009/HO/0476/2021 to The APCCF, Wildlife, MP and The Additional Managing Director, MPTB • Hardcopy is handed over personally to The Field Director, STR • SAI/BAUP219009/HO/0530/2021 to The Chief Scientific Officer, EPCO

		SAI/BAUP219009/HO/0529/2021 to The Joint Director, TCPO
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.	Noted and data is incorporated in section-13.2.4 of chapter 13
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.	Noted.
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.	Noted. Carrying capacity is calculated as per MoEFCC method and was reviewed and approved by the Field Director, STR
6	Restructure the chapters/ template according to draft guidelines by MoEFCC	Restructured report as per draft guidelines by MoEFCC is already submitted

1.2.9.3.4 Comments and approvals from Other 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 approvals. The same letters have been annexed in annexure 17.3.

Table 9- 6: Letters send to various departments by Madhya Pradesh Tourism Board

Sr No.	Letter No.	Date	Section of Draft Zonal Master Plan	Departments
1	3207/PLG/MPTB/2021	31.05.2021	Infrastructure	Panchyat & Rural Development Department
2	3207/PLG/MPTB/2021	31.05.2021	Infrastructure	Madhya Pradesh Rural Road Development Authority
3	3209/PLG/MPTB/2021	31.05.2021	Infrastructure	Department of Forest
4	3208/PLG/MPTB/2021	31.05.2021	Infrastructure	The Divisional Commissioner, Hoshangabad
5	3205/PLG/MPTB/2021	31.05.2021	Infrastructure	Public Works Department
6	3204/PLG/MPTB/2021	31.05.2021	Infrastructure	Urban Development and Housing
7	3198/PLG/MPTB/2021	31.05.2021	Conservation	Water Resource Department
8	3202/PLG/MPTB/2021	31.05.2021	Conservation	Archeological Survey of India, Jabalpur Circle

Sr No.	Letter No.	Date	Section of Draft Zonal Master Plan	Departments
9	3203/PLG/MPTB/2021	31.05.2021	Conservation	Department of Archaeology Archives and Museums
10	3201/PLG/MPTB/2021	31.05.2021	Conservation	Madhya Pradesh Pollution Control Board
11	3199/PLG/MPTB/2021	31.05.2021	Conservation	Department of Forest
12	3200/PLG/MPTB/2021	31.05.2021	Conservation	Environment Department
13	3186/PLG/MPTB/2021	31.05.2021	Traffic & Transportation	Divisional Commissioner, Hoshangabad
14	3188/PLG/MPTB/2021	31.05.2021	Land use & Landcover	Town and Country Planning
15	3189/PLG/MPTB/2021	31.05.2021	Land use & Landcover	The Collector, Dist. Hoshangabad
16	3187/PLG/MPTB/2021	31.05.2021	Land use & Landcover	Urban Development and Housing
17	3190/PLG/MPTB/2021	31.05.2021	Tourism	Madhya Pradesh Ecotourism Development Board
18	3191/PLG/MPTB/2021	31.05.2021	Tourism	Madhya Pradesh State Tourism Development Corporation
19	3212/PLG/MPTB/2021	31.05.2021	Agriculture	Panchyat & Rural Development Department
20	3193/PLG/MPTB/2021	31.05.2021	Agriculture	Farmer Welfare and Agriculture Department
21	3195/PLG/MPTB/2021	31.05.2021	Agriculture	Sate Rural Livelihoods Mission
22	3213/PLG/MPTB/2021	31.05.2021	Agriculture	Horticulture and Animal Husbandry
23	3192/PLG/MPTB/2021	31.05.2021	Agriculture	Department of Agriculture
24	3194/PLG/MPTB/2021	31.05.2021	Agriculture	Micro, Small and Medium Enterprises Department

The comments/ suggestions received from various departments are in annexure 17.4. The compliance report for the same is ad in below tables.

PCCF (Wildlife), department of Forest, Madhya Pradesh

Table 9- 7: Compliance report for comments from forest department of Madhya Pradesh

Sr No	Comments/ suggestions	Remarks
	Chapter: Tourism	
1	Construction Type & Material: With a view to reducing environmental impact of upcoming projects, proposals of ecofriendly structures, such as tents, mud houses, wooden machans and bamboo structures will be given priority. The use of bricks, cement and concrete in commercial projects/ resorts should be reduced to minimum.	Noted. Incorporated in section 10.3. (page No.8)

Sr No	Comments/ suggestions	Remarks
	Light: In all existing/upcoming private properties/ resorts, the following precautions should be taken so that the impact on surrounding wilderness may be minimal and energy conserved:	The proposal for lighting its provision and designs are briefly discussed in section 11.15.5. (Page No. 244)
	Use of external light should be as minimal as possible.	
	Use of "white lights" should be avoided and only CFL (yellow light) should be used as minimally as possible.	
	Use of focus lamp/halogen lamps in the open areas of the resort is strictly prohibited.	
3	Solar Energy: For New Resorts Use of solar lighting in common areas and that of solar water heaters in the room will be mandatory.	Noted. Incorporated in section 11.15.3. (Page No. 232)
	For Exiting Resorts Considering the exiting investment on heating and lighting needs to be replaced with solar energy gradually.	
4	Legitimate Purchase of Fuelwood: All lodges/resorts/hotel owners are supposed to make legitimate purchases of fuelwood for their needs. They are advised to buy fuelwood from forest depots for their campfires and discourage villagers to resort to illicit felling for easy income.	Noted. Incorporated in section 13.7.2 Accommodation (Page No. 339)
5	Rainwater Harvesting: All tourism resorts are harvesting water from underground water sources but no infrastructures for harvesting of rainwater for their perpetual needs/demands. It is common that environmental unfriendly practice will lead to depletion of ground water table of the surrounding areas. Every existing and upcoming resort should create reasonable dugouts at low lying areas of the property and undertake roof water harvesting measures.	The proposal is briefly discussed in section 11.4 (Page No. 151). Suitable methodology for the land use also mentioned in same section.
6	Fencing: For all the existing and upcoming resort/private properties: The existing barbed wire/chain-link fencing/mud-wall should be removed completely at the earliest. The fortification of the hotel/resort campus should be done with live hedge. Solar fencing is advisable. It is suggested that the height of the live fencing should be around 4ft.	Noted. Incorporated in section 10.4.2. (Page No. 81)

Sr No	Comments/ suggestions	Remarks
7	Building Height: Upcoming Resort/New Sanction The structure of building shall be sanctioned only as ground plus one (G+1). Note: The above provision shall not be applicable to existing resorts/hotels constructed before the constitution of the monitoring committee.	The Permissible heights for the resorts and Eco-cottages are proposed 7 m (mentioned under ET2 and ET3 land use in table 10.31, page no. 90-91), which allows construction up to G+1.
8	Area Allowed for Construction: All the upcoming resorts/hotels sanctioned for construction shall be permitted to a maximum of 5% of the total land area. This provision will not be applicable for the homestays belonging to indigenous people.	Noted. Incorporated in Table 10.31 (7). (Page No. 90-91)
9	General Restrictions & Conditions: All the DJ music/loud music system above 50 DB (decibels) shall be prohibited. No music systems of any kind shall be permitted post 10:00pm.	The standard limit for noise is proposed 40dB as per CPCB guidelines and silence zone is proposed from 7 PM to 7 AM in section 11.10.9. (Page No. 209)
	After 10:00pm all music systems shall remain prohibited in public places falling within Eco-Sensitive Zone as well.	
	Dumping of waste material in open areas shall be strictly prohibited. It is vitally essential for all tourism infrastructures to ensure better management of solid and other wastes. All concerned lodges/hotels/resorts shall be responsible for the classification of biodegradable and non-biodegradable waste and their proper disposal. Untreated effluents from the lodge released out into the open or into any river systems or water body shall be prohibited.	The provision for dumping of waste material is prohibited and a segregation and collection system for solid waste management is proposed in section 11.6. (Page No. 162)
	All tourism infrastructures need to follow a uniform color code that blend with the natural surroundings.	Noted. Incorporated in section 13.7. (Page No. 339)
10	Provision of Employment Generation for Local Communities: It will be binding on all tourism infrastructures to engage a minimum of 75% local (Bonafide residents of Madhya Pradesh) people as their employees.	Noted. Incorporated in section 15.4. (Page no. 365)
11	Promotion of Organic farming: All the resort owners are advised to promote organic farming in and around the villages and make arrangements for buyback from the local farmers.	The Organic farming and establishment of market chain is already proposed in section 12.3.1. (Page No. 252)
12	The carrying capacity calculated for the tourism zones indentified within Eco Sensitive Zone cannot be based on the formula used for calculating carrying capacity of protected Zone of Satpura Tiger Reserve.	Carrying Capacities are calculated as per NTCA guidelines for the tourism zones of Eco-Sensitive Zone only and not for protected area of STR. The carrying capacity is applied when the potential of all the designated tourism zone is realized. However, the forest department can restrict or release the number of tourists as per NTCA guidelines. Carrying Capacities are calculated only for ready reference.

Sr No	Comments/ suggestions	Remarks
13	Other corrections: 1. In the section 2.4.1 under Khamda Cluster, a note has to be mentioned that this cluster is the part of Bori Sanctuary.	Noted. Incorporated in section 10.3.12. (Page no. 65)
	2. Under section 2.8 all the carrying capacity should be in terms of vehicle number not number of tourists.	Noted. Incorporated in Table 13.23. (Page No. 348)
	Chapter: Traffic, Transportation and Infrastructure	
14	Under Section 2.3.1 in the table no: 2-1, in the Route 9, Dhasai-Khamda/Dhasai-Bardha/Dhasai-Suplai/Dhasai-Mallupura should be removed from the proposed widening and new roads as these areas are inside the Bori Wildlife sactuary. And, there is no need for widening or new road as the villages are relocated from the Sanctuary.	Dhasai-Khamda/Dhasai-Suplai/Dhasai-Mallupura are the existing roads and no proposals are given. (Figure 11.40, Page No. 200)
15	Under Section 2.4.2 Khamda Zone will be deleted as there is no need for speed breakers in this zone.	A note is mentioned in section 10.3.12 (Page No. 65) regarding the approval and implementation of the proposed land-use and proposed activities will be as per decision/prior permission by forest department and NTCA guidelines as the areas is part of Bori Sanctuary. The proposals only to be implemented with permission of office of STR.
16	Under Section 2.4.4 for all the new road repairs and constructions, "Animal Passage Plan" be prepared on the basis of the guidelines named " Eco-friendly Measures to Mitigate Impacts on Linear Infrastructures on Wildlife" by Wildlife Institute of India, Dehradun for Protected Areas, notified ESZ around PAs as per the letter No 6-4/2018 Dated 13-07-2018 Ministry of Environment, Forests and Climate Change, New Delhi. This will be binding on all the User agencies to follow in case of new road construction.	Noted. Incorporated in Section 11.10.10 (9). (Page no. 210)
17	Section 2-1. In the table no 2.1 the grand total for the population may be given.	Noted. Incorporated in Table 3.3 (Page No. 68) of Part-1.
18	In table 2-3, there is no Madhai Zone in the buffer area, so it may be noted as Parsapani and Jamanidehi buffer zones.	Noted. Incorporated in Table 10.5 (Page No. 18).
19	In the Section 2.4.6 under Solar Power, examples of solar pumps and lights may be taken from relocated villages of STR namely Ghodanar, Bathkachhar, Sakot. For solar electrification many examples like Madai rest house and Patrolling camps of STR may be given so that people could appreciate easily.	Noted. Incorporated in section 11.15.3. (Page No. 232)
20	The text and legends in the maps are not easily readable, appropriate font size and color combination has to be ensured.	Maps prepared in the report are indicative, still the comment has been noted, and changes are made accordingly. For further reference,

Sr No	Comments/ suggestions	Remarks
		portfolio of maps will be submitted in final submission.
	Chapter: Conservation	
21	Para no 1.1.5: Presently only there are 5 villages (revenue) inside the protected area of STR instead of 24 villages.	Noted. Incorporated in section 3.1 (Page No.57) of Part -1.
22	Para no 2.2.1 under Encroachment Para, regularization of encroachment on forest land shall be as per "The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 in place of "Indian Forest Act,1927".	Noted. Incorporated in section 10.6.1 (Encroachment Para.) (Page no. 110)
23	Para 2.2.3 Under "Animal Passageway" circuit road proposed in STR, which is not required from conservation point of view, which must be removed.	Noted. Incorporated in section 11.10.4. (Page No. 202)
	Chapter: proposed Land-use Land-cover and regulation guidelines	
24	Para 1.1 Land Cover: Area under each land cover category should be given in Ha and it should be only for the eco-sensitive zone and not for Protected Area.	Noted. Incorporated in Table 4.1 (Page no. 142) and Table 4.2. (Page no. 148)
25	Para 2.3.10 Churni Cluster: Since Churni cluster is inside the Pachmarhi Wildlife Sanctuary, therefore, appropriate mention needs to be made. This zone is not a part of the ESZ.	Noted. Incorporated in section 10.3.10 (Page No. 55)
26	Para 2.3.12 Khamda Cluster: This is part of Bori Wildlife Sanctuary and not a part of the ESZ therefore, should be mentioned accordingly. Since this zone is part of Bori Wildlife Sanctuary and the whole area is forest land, therefore, no need to propose any change in Land-use land-cover as given in the table no: 2-24.	A note is mentioned in section 10.3.12 (Page no. 65) regarding the approval and implementation of the proposed land-use and proposed activities will be as per decision/prior permission by forest department and NTCA guidelines as the areas is part of Bori Sanctuary.
27	Para 2.3.14 Pachmarhi Cluster: Needs to be mentioned that this cluster is part of Pachmarhi Wildlife Sanctuary and Changes proposed in Table 2-28 shall be subject to the Honorable SC and HC orders related to Pachmarhi area.	Noted. Incorporated in section 10.3.14. (Page no. 75)
28	Para 3.1 It has been written "For any kind of activity or construction in other than revenue area of ESZ, NOC must be taken from Forest office of STR" there is no such provision in ESZ notification. Any tourism related construction on private/revenue areas of ESZ, the applicant has to take permission as per LAC Provisions of Wildlife Protection Act, 1972 and provisions of ESZ notification and approval of the monitoring committee. For all other activities permission/ approval must be taken from concerned departments.	The permission from Forest Officer of STR required for any kind of activity on forest land (Other than revenue area). The other regulatory acts are mentioned in section 10.4.1 (Page No. 80)

Sr No	Comments/ suggestions	Remarks
29	Table no 3-3 Zoning and Land-use: SI no 7 under Ecotourism Zone, permissible ground coverage given are 10% and 7% respectively for Eco-huts/cottages and resorts. But in Table no 3-8, proposed developed area is allowed 20% of the total plot area. This needs to be corrected.	Noted. Incorporated in table 10.36. (Page No.96)

Comments from IP department of Madhya Pradesh Tourism Board

Table 9- 8: Compliance report for comments from IP Section of Madhya Pradesh Tourism Board

Sr No	Comments/ suggestions	Remarks
1	सतपुड़ा नेशनल पार्क अंतर्गत इको सेंसटिव जाने तैयार ड्राफ्ट मास्टर प्लान का गहन एवं विस्तारित अध्ययन किया गया अध्ययन उपरांत इसमें निम्नलिखित तथ्यों को ड्राफ्ट मास्टर पालन की कंडिका ११३ में जोड़ा जाना आवश्यक है 1.Strength: Waterbody along with wildlife 2. Opportunity: River crouse along with wildlife 3. Weakness: No required system to allow tourism in Tawa reservoir by state department 4. Local People Specially Tribues: May visited opening up their wildlife	Noted. Incorporated in Chapter 8 (Page No. 256)
2	काण्डिका 2.4.1 वाइल्डलाइफ टूरिज्म जोन मढई कल्स्टर अंतर्गत सारंगपुर ग्राम टूरिज्म विभाग ध्वारा रिसोर्ट निर्माण हेतु निजी निवेश को भूमि आवंटित की गई है। अतः उकत ग्राम को भी रिसॉट केटेगरी में लिया जाना चाहिए इस क्लस्टर को वॉटर टूरिज़्म के लिए भी आरक्षित किया जाना चाहिए । कियोंकि देनवा नदी से तवा बांध में क्रूज/वॉटर टूरिज़्म फलीभूत हो सकता है ।	The land parcel is incorporated as Government land in Proposed LULC. The land use RE3 (recreational -3) is proposed for water tourism activities in Parsapani cluster in section 10.3.2 (table-10.4, Page No. 18).
3	कण्डिका 2.4.3 अंतर्गत डोकरीखेड़ा ग्राम में पर्यटन विभाग की भूमि उपलब्ध है, यहाँ भविष्य में निजी निवेशक को रिसोर्ट आदि पर्यटक परियोजना की स्थापना हेतु भूमि आवंटित किया जाना है	Noted.
4	बोरी सेंचुरी अंतर्गत धपाड़ामाल और गुरगुन्दा ग्रामों का उल्लेख मास्टर प्लान में अवलोकित नहीं हुवा है, इन गावों में भी Accommodation जैसी पर्यटन गतिविधियों के लिए जोड़ा जाना चाहिए । इसी तरह मटकुली के आसपास चाकर, कठोतिया, छिरई जैसे ग्रामो को भी Accommodation जैसी पर्यटन गतिविधियों के लिए जोड़ा जाना चाहिए इन ग्रामों में रिसोर्ट जैसी गतिविधियों के लिए भूमि पर्यटन विभाग को आवंटित हुई है ।	The mentioned villages of Dhapadmal and Gurgunda are not notified villages as per notification S.O.2538(E). The accommodation facility is proposed in surrounding of Matkuli area, which can be referred in section 10.3.6 (Page No. 34)
5	पंचमढ़ी के आसपास चौरागढ, राजेंद्रगिरि, धूपगढ़ तथा छोटा-बड़ा महादेव क्षेत्र में रोप-वे अथवा केवल कार जैसी गतिविधियों को जोड़ा जाना चाहिए। इसी तरह पंचमढ़ी के आसपास हॉट एयर बलून, सी-प्लेन / हेलीकॉप्टर टूरिज्म को भी जोड़ा जाना चाहिए	Because of ongoing court case of Pachmarhi, only public amenities are proposed in the area of Pachmarhi. The existing activities will be permitted as per present status.

Sr No	Comments/ suggestions	Remarks
6	वस्तुतः मास्टर प्लान में जितने भी टूरिज्म जॉन बनाए जा रहे है उन सभी जॉन में एक प्रावधान "टूरिज्म पॉलिसी में परिभाषित/ वर्णित पर्यटन परियोजना के लिए आरक्षित " जोड़ा जाना चाहिए ताकि भविष्य के लिए निवेश एवं अधो संरचनात्मक विकास की सम्भावना बनी रहे	The future development is permitted under various acts and schemes, which can be referred in section 10.4.1. (Page No. 80)

Comments from TCPO department of Madhya Pradesh Tourism Board

Table 9- 9: Compliance report for comments from Town and Country Planing department of Madhya Pradesh

Comments/Inputs of Draft Zonal Master Plan of Eco Sensitive Zone of Satpura Tiger Reserve				
SN	**PAGE NO.**	**SUBJECT**	**REMARKS**	**Remarks**
1	9	TABLE 1.1 Developable land in ESZ Area	Total ESZ area 1079.43 sqkm figure कहां से लिया गया स्पष्ट नहीं है	The area is considered from section 1(1) of Notification S.O.2538(E), issued by the Ministry of Forest and Climate Change (MoEFCC). The same has been finalized with the Field Director Satpura vide Minutes of Meeting annexed in Annexure 2.2. (Part-3, Page No.38)
2	35	FIGURE 2.3 Decadal changes in LULC of ESZ	Figure 2.3 रिपीट किया गया है	Figure 1.2 (Part-1 Section-4.4.1, Page No.147) is the part of baseline study and in figure 2.3 is for reference only.
3	39	FIGURE 2.6 Classification of proposed LULC of ESZ	Text में 17.24 % लिखा गया है जो कि Figure 2.6 में Clear नहीं है	Noted. Incorporated in Section 10.1. (Page No.2)
4	42	FIGURE 2.8 Existing LULC of Tawanagar cluster	Agriculture area और Forest area के Color coding मानचित्र में Same दर्शायी है	The symbology and color coding are different for forest and agriculture. For further reference, portfolio of maps in scale of 1:4000 will be submitted in final submission.
5	45	TABLE 2.2 Change in LULC of Tawanagar cluster	2039.51 hectar हेक्टेयर कहां से लिया गया है Clear नहीं है	Noted. Incorporated in table 10.3. (Page No.13)
6	48	Proposed landuse landcover for Madhai Cluster	LAST LINE में FIGURE 3.11 एवं TABLE 3.3 गलत लिखा है	Noted. Incorporated in section 10.3.2. (Page No.14)

Comments/Inputs of Draft Zonal Master Plan of Eco Sensitive Zone of Satpura Tiger Reserve				
SN	**PAGE NO.**	**SUBJECT**	**REMARKS**	**Remarks**
7	50	TABLE 2.4 Change in LULC of Madhai cluster	Developed area में Existing LULC से Proposed LULC में काम है जो की possible नहीं है	The roads were considered as part of existing land use land cover file received from the State-IT department. Which is segregated as separate layer in Proposed LULC area.
8	53	Proposed LULC for Dokrikheda Cluster	LAST LINE में FIGURE 3.13 एवं TABLE 3.5 गलत लिखा है	Noted. Incorporated in section 10.3.3. (Page No.19)
9	55	TABLE 2.5 Area table for proposed land use of Dokrikheda cluster	Table 2.5 के नीचे लिखा text में Table 3.6 लिखा है जो कि गलत है	Noted. Incorporated in section 10.3.3. (Page No.19)
10	55	TABLE 2.6 Change in LULC of Dokrikheda cluster	Developed area में Existing LULC से Proposed LULC में कम है जो कि possible नहीं है	The reason for decrease in area is because in existing LULC, the roads were considered as built-up, which is segregated as separate layer in Proposed LULC.
11	59	Proposed LULC for Madho-Bori Cluster	LAST LINE में FIGURE 3.15 एवं TABLE 3.7 लिखा है जो गलत है	Noted. Incorporated in section 10.3.4. (Page No.24)
12	61	TABLE 2.7 Area table for proposed landuse for Madho-bori cluster	LAST LINE में Table 3.8 लिखा है जो कि गलत है	Noted. Incorporated in section 10.3.4. (Page No.24)
13	61	TABLE 2.8 Change in LULC of Madho-bori cluster	Developed area में Existing LULC से Proposed LULC में काम है जो कि possible नहीं है	The reason for decrease in area is because in existing LULC, the roads were considered as built-up, which is segregated as separate layer in Proposed LULC.
14	62	Existing LULC scenario	Figure 3.1 गलत लिखा गया है	Noted. Incorporated in section 10.3.5. (Page No.29)
15	64	Proposed LULC for Bargondi cluster	Last line में Figure 3.17 एवं table 3.9 गलत लिखा है	Noted. Incorporated in section 10.3.5. (Page No.29)
16	70	FIGURE 2.19 Proposed LULC of Matkuli cluster	Index में Agriculture एवं Forest में color coding same है	The symbology and color coding are different for forest and agriculture. For further reference, portfolio of maps will be submitted in final submission.

Comments/Inputs of Draft Zonal Master Plan of Eco Sensitive Zone of Satpura Tiger Reserve				
SN	**PAGE NO.**	**SUBJECT**	**REMARKS**	**Remarks**
17	72	TABLE 2.12 Change in landuse of Matkali cluster	Developed area में Existing LULC से Proposed LULC में काम है जो की possible नहीं है	The reason for decrease in area is because in existing LULC, the roads were considered as built-up, which is segregated as separate layer in Proposed LULC.
18	75	Proposed landuse for Pisua Cluster	Figure 3.21 एवं Table 3.13 गलत लिखा है	Noted. Incorporated in section 10.3.7. (Page No.40)
19	79	Existing LULC scenario	Figure 3.1 गलत लिखा है	Noted. Incorporated in section 10.3.8. (Page No.45)
20	81	Proposed landuse for Bandhan cluster	Last line में Figure 3.23 एवं 3.15 लिखा है जो गलत है	Noted. Incorporated in section 10.3.8. (Page No.45)
21	82	FIGURE 2.23 Proposed LULC of Bandhan cluster	Agriculture area और Forest area के Colour coding मानचित्र में same दर्शायी है	The symbology and color coding are different for forest and agriculture. For further reference, portfolio of maps will be submitted in final submission.
22	83	Table 2.16 Change in LULC of Bandhan cluster	Developed area में Existing LULC से Proposed LULC में कम है जो कि possible नहीं है	The reason for decrease in area is because in existing LULC, the roads were considered as built-up, which is segregated as separate layer in Proposed LULC.
23	88	Table 2.18 Change in LULC of Bhurabhagat cluster	Developed area में Existing LULC से Proposed LULC में कम है जो कि possible नहीं है	The reason for decrease in area is because in existing LULC, the roads were considered as built-up, which is segregated as separate layer in Proposed LULC.
24	92	Proposed landuse for Churni Cluster	Last line में Figure 3.27 एवं Table 3.19 लिखा है जो कि गलत है	Noted. Incorporated in section 10.3.10. (Page No. 55)
25	93	Figure 2.27 Proposed LULC for Churni cluster	Agriculture area और Forest area के Colour coding मानचित्र में same दर्शायी है	The symbology and color coding are different for forest and agriculture. For further reference, portfolio of maps will be submitted in final submission.
26	94	Table 2.20 Change in landuse of Churni cluster	Developed area में Existing LULC से Proposed LULC में कम है जो कि possible नहीं है	The reason for decrease in area is because in existing LULC, the roads were

Comments/Inputs of Draft Zonal Master Plan of Eco Sensitive Zone of Satpura Tiger Reserve				
SN	**PAGE NO.**	**SUBJECT**	**REMARKS**	**Remarks**
				considered as built-up, which is segregated as separate layer in Proposed LULC.
27	95	Existing LULC scenario	Last line में Figure 3.2 लिखा है जो की गलत है	Noted. Incorporated in section 10.3.11. (Page No.60)
28	96	Figure 2.28 Existing LULC of Alimod Baruth Cluster	Agriculture area और Forest area के Colour coding मानचित्र same में दर्शायी है	The symbology and color coding are different for forest and agriculture. For further reference, portfolio of maps will be submitted in final submission.
29	97	Proposed LULC for Alimod-Baruth Cluster	Last line में Figure 3.29 एवं Table 3.21 लिखा है जो कि गलत है	Noted. Incorporated in section 10.3.11. (Page No.60)
30	98	Figure 2.29 Proposed LULC of Alimod Baruth cluster	Agriculture area और Forest area के Colour coding मानचित्र में same दर्शायी है	The symbology and color coding are different for forest and agriculture. For further reference, portfolio of maps will be submitted in final submission.
31	99	Table 2.22 Change in LULC of Alimod-Baruth	Developed area में Existing LULC से Proposed LULC में काम है जो कि possible नहीं है	The reason for decrease in area is because in existing LULC, the roads were considered as built-up, which is segregated as separate layer in Proposed LULC.
32	102	Proposed LULC Khamba Cluster	Last line में Figure 3.31 एवं Table 3.23 लिखा है जो कि गलत है	Noted. Incorporated in section 10.3.12. (Page No.65)
33	104	TABLE 2.23 Area table for proposed landuse of Khamda cluster	Table के नीचे लिखे text में 3.24 लिखा है जो कि गलत है	Noted. Incorporated in section 10.3.12. (Page No.65)
34	106	Figure 2.32 Existing LULC for Dhasai cluster	Agriculture area और Forest area के Colour coding मानचित्र में same दर्शायी है	The symbology and color coding are different for forest and agriculture. For further reference, portfolio of maps will be submitted in final submission.
35	107	Proposed land use for Dhasai cluster	Figure 3.33 एवं Table 3.25 लिखा है जो कि गलत है	Noted. Incorporated in section 10.3.13. (Page No.70)

Comments/Inputs of Draft Zonal Master Plan of Eco Sensitive Zone of Satpura Tiger Reserve				
SN	**PAGE NO.**	**SUBJECT**	**REMARKS**	**Remarks**
36	109	Table 2.25 Area table for proposed landuse for Dhasai cluster	Table के नीचे लिखे text में 3.2 लिखा है जो कि गलत है	Noted. Incorporated in section 10.3.13. (Page No.70)
37	109	Table 2.26 Change in LULC of Dhasai cluster	Developed area में Existing LULC से Proposed LULC में कम है जो कि Possible नहीं है	The reason for decrease in area is because in existing LULC, the roads were considered as built-up, which is segregated as separate layer in Proposed LULC.
38	115		जहां-जहां नगर तथा ग्राम निवेश विभाग के Act एवं Rules लागु होते है उन्हें केंद्र सरकार द्वारा पारित Act तथा Rules ही Supersede कर सकते है, जिनका स्पष्ट उल्लेख किया जाना आवश्यक है	Noted. Incorporated in section 10.4.1. (Page No.80)
39	125 to 132		Table में marking नहीं कि गई है	Noted. Incorporated in table 10.31. (Page No.86)
40			समस्त Table में sourceदिया जाना चाहिए	The reference for tables and figures is given which are used from secondary sources. No sources are mentioned for the tables and figures generated for analysis by the team of SAI.
41			मनचित्रों की numbering, Figure की जगह Map लिखकर की जानी चाहिए	Graphical representation given in the report are not to scale and used as reference images only. Hence, the maps are denoted as Figure.
42			समस्त Figures एवं Table की Numbering करें	Noted and incorporated as required.
43			समस्त Maps की Color coding check करें	Noted and incorporated as required.

Table 9- 10: Compliance report for comments from minutes of Meeting of meeting at MPTB office

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 IP Section, Madhya Pradesh Tourism Board and other Stakeholders

SN	SUBJECT	REMARKS
1	A brief introduction about provisions of notification, the methodology adopted, and proposals of Zonal Master Plan were explained in the meeting. Proposals of zonal master plan on survey numbers for land ownership of Madhya Pradesh Tourism Board were discussed briefly. The list of plots is annexed with MoM. It was suggested to permit development of tourism activities in existing land parcels owned by Madhya Pradesh Tourism Board situated in proposed tourism zones of Master Plan as per the state tourism policy and bounded by the notification of eco-sensitive zone.	Noted. Incorporated in Section 10.4.1. (Page No.80)
2	Modification of activities were suggested in mentioned below survey numbers. 1. Survey No. 9 of Chhirai Village for Camping. 2. Survey No. 1 and 3 of Sarangpur village for Accommodation purpose.	Noted. Incorporated in Section 10.3.6. (Page No.34) and Section 10.3.2 (Page No.14). The map will be able to see in 1:4000 in subsequent submission.
3	During the discussion, the team of consultant were asked to discuss the proposals in the MPTB owned land parcels situated in village of Chhirai and Chakar.	Noted. it was pointed out that the MPTB owned land parcel in Chhirai village is in protected area of Satpura Tiger Reserve, which can be further developed within the purview of prevailing applicable acts.
4	Furthermore, It was anticipated by the team of MPTB that Chakar village is also de-notified from Pachmarhi Sanctuary, but not in list of notified villages of ESZ. In response to that, team of consultant discussed the boundaries of ESZ on GIS platform and explained that Chakar village is forming the part of protected area of STR. In further discussion, consultant was asked to finalize status (notified/ de-notified) of Chakar village from office of the Field Director, STR.	Noted. Same has been discussed with the Field Director, STR and concluded that the land parcel situated in Chakar village is forming the part of protected forest zone and is not de-notified from the Pachmarhi sanctuary. (The gazette notification of de-notified villages of Pachmarhi Sanctuary and villages which are part of sanctuary is given in the annexure). The scope for consultant is limited to prepare the master plan for defined boundary of Eco-Sensitive Zone given as per the notification S.O. 2538(E).
5	Location of Land parcels situated in Dhapada Mal and Gurgunda villages were also shown in the meeting. These land parcels are not within Eco-sensitive zone boundaries as per the notification stated above. The same was agreed by the officials of MPTB.	Noted.
6	A brief discussion regarding a sample sheet of 1:4000 and Government lands was carried out with Mr. Prashantsingh Baghel, Joint Director and Ms. Tanvi Shrivastav, Tourism Planner. Consultant was asked to finalize grid, layout of maps and representation of government land in proposed	Noted. The meeting was arranged on the same day with Dr. Amit Gajbhiye and the discussion points for the meeting are stated in Sr. No.7 and 8.

SN	SUBJECT	REMARKS
	land-use map with Mr. Amit Gajabhiye, Joint Director, TCPO.	
7	As per the suggestion stated in sr. no. 6, maps and other details were discussed with Mr. Amit Gajabhiye, Joint Director, TCPO and Mr. Manoj Gehlot, Joint Director, TCPO at office of Town and Country Planning Organization, Bhopal. Discussion points are stated below. • It was suggested that the legends in map layouts shall be in succeeding order of polygon, polyline and point. • The grid of geo-coordinates shall be displayed in layouts/ maps prepared in scale of 1:4000. • The color coding of Residential and Existing settlements shall be modified as per the state TCPO guidelines and proposed land-use maps prepared by TCPO. • Number of adjoining sheets are to be displayed in layout of each grid map. •It was suggested to mention 'submitted to' in map layout section followed with 'summitted by' categories in index of map.	Noted. Incorporated in proposed land-use maps prepared for master plan proposals of Eco-Sensitive Zone in scale of 1:4000.
8	• The representation of government lands was briefly discussed during the meeting. It was agreed by the Joint Director that the ownership and proposed land-uses are the different categories of map. Hence, Government land can only be represented as indicative layer for reference. It was further added that the classification for use of government land according to its nearby proposals of land-use should be mentioned in the chapter no. 10: Definition of land use of the draft master plan report prepared for ESZ.	Noted. Incorporated in Section 10.4.2. (Page No.81)

Table 9- 11: Compliance report for comments from MPSRLM, Bhopal

Page Number	In Draft	Suggestions / Corrections	Remarks
27 Role of volunteers and Self-help groups	-To Collaborate with farmers from Mandal and Dingdori District who have sucessfully adopted the cultivation of Kodo and Kutki Millets. The volunteers can seek help from these farmers and convince them to talk and motivate the farmers of STR. -The self-help groups can connect and coordinate with NGOs, volunteers and farmer producing companies to tie up with the farmers of STR and help then in production of millets and also for value	-Check Spellings of Mandla and Dindori -The Self-Help Groups can connect and coordinate with their Cluster Level Federations, NGOs, volunteers and Farmer Producer Companies to tie up with the farmers of STR and help then in production of millets and also for value added production by using the millets.	Noted. Incorporated in Section 12.3.1 (Page No. 252)

Page Number	In Draft	Suggestions / Corrections	Remarks
	added production by using the millets. These tie up should also be linked with incentives to both farmers and the Companies. The incentives are to be fixed by negotiation process.		
28	Therefore, the volunteers from the center should try to establish a processing unit near the cluster with the help of self-help group and associated Companies	Therefore, the volunteers from the center should try to establish a processing unit near the cluster with the help of Self-Help Groups and associated Cluster Level Federations and Farmer Producer Companies.	Noted. Incorporated in Section 12.3.1 (Page No. 252)
28	Promotion of Organic farming, encouragement to increase traditional crops production, use of biofertilizers and agro forestry can lead to develop agritourism in the region	Promotion of Organic farming, encouragement to increase traditional crops production, use of biofertilizers and agro forestry with the involvement of women Self Help Groups also can lead to develop agri-tourism in the region	Noted. Incorporated in Section 12.3.1 (Page No.252)
45	these tribal enterprises will be in the form of Van Dhan SHG's which will be a group of 15-20 members and such 15 SHG groups will further be federated into larger group of Van Dhan Vikas Kendras (VDVK's) of around 300 members	These tribal enterprises will be in the form of van dhan SHG's which will be a group of either already existing NRLM promoted SHG's IN the area or will be formed with the help of NRLM staff and such 15 SHG groups will further be federated in to larger group of Van Dhan Vikas Kendras (VDVK's) of around 300 members or may be adopted by already NRLM registered CLF (Cluster Level Federation) as VDVK's	Noted. Incorporated in Section 12.3.4 (Page No.279)

Page Number	In Draft	Suggestions / Corrections	Remarks
50-51 Household industries through SHGs:	Under National Rural Livelihood Mission and State Rural Livelihood Mission, SHGs have been formulated in villages. NRLM 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 NRLM centers under super vision of Block managers of RLM centers.	SRLM can promote small scale enterprises / industries with the Cluster Level Federations, with Bank linkages, 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 under supervision of Block Managers of SRLM.	Noted. Incorporated in Section 12.4.2 (Page No.290)
52	Establishment of Number of Poultry estates in collaboration with government-initiated agency, such as the National Cooperative Development corporation) NCDC….	Establishment of Number of Poultry estates in collaboration with government-initiated agency, such as the NRLM (National Rural Livelihood Mission, National Cooperative Development Corporation) NCDC	Noted. Incorporated in Section 12.3.5 (Page No.282)
54	It is very much necessary to raise awareness about the venture	The MPSRLM promoted CRP / Pashu sakhi can be used as local resource person to organize awareness campaign in rural areas and also may provide doorstep services to adopt Use of locally available indigenous feed resource and ethno veterinary medicine and educating farmers can be viable options to improve backyard poultry production in rural area in a business model.	Noted. Incorporated in Section 12.3.5 (Page No. 282)
	Use of locally available indigenous feed resources and ethno veterinary medicine and educating farmers can be viable options to improve backyard poultry production in rural area		
59	Private Sector is one of the most important parts in Promotion of agro tourism	NRLM promoted Collectives and Private Sector are most important part in the promotion of Agro Tourism	Noted. Incorporated in Section 12.4.3 (Page No.291)
		It is also pertinent to mention here the SRLM shall organize all deprived people (As per SECC Data 2011) into SHGs and higher-level federation to augment their	Noted. Incorporated in Section 12.4.3 (Page No.291)

Page Number	In Draft	Suggestions / Corrections	Remarks
		livelihoods and improve their overall Socio-economic conditions	

Table 9- 12: Compliance Report for Minutes of Meeting for discussion with TCPO

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)) of Madhya Pradesh with the Joint Director (Planning) Madhya Pradesh Tourism Board and the Joint Director, Town and Country Planning, Bhopal, Madhya Pradesh.		
SN	**SUBJECT**	**REMARKS**
1	A brief introduction about provisions of notification, the methodology adopted, and proposals of Zonal Master Plan were explained in the meeting. It was suggested by the Joint Director, TCP that Development Control Regulation guidelines shall not be as per urban colonial regulations but shall be in line with RADPFI guidelines in applicable land uses. It was further added that term FSI shall be replaced with FAR.	Noted. Incorporated in Table - 10.31. (Page No.86)
2	The legal dispute for Pachmarhi areas was briefly discussed during the meeting. By reviewing the horizontal and vertical restrictions ordered by the Supreme Court and implied by the State Government, it was suggested to mention "Notwithstanding anything contained in this plan, the development control regulations shall be as may be decided by the state government from time to time." it was further suggested to replace the urban-bodies word with settlement.	Noted. Incorporated in Section 10.3.14. (Page No.77)
3	It was pointed out during the discussion that existing tourism infrastructure/ amenities shall be demarcated as point location and can be attached as a separate map. Further it was also added that the description and list of all existing tourism infrastructure/ amenities shall be mentioned in sub-zonal tourism master plan. The list of the existing tourism infrastructure/ amenities shall be annexed accordingly. List of existing tourism infrastructure/ amenities available with revenue department of District should also be incorporated in Zonal Master Plan.	Noted. Incorporated in Section 13.1. (Page No.298) and Annexure - 13.1 to 13.3 (Page no. 103 to 115)

Table 9- 13: Compliance Report for comments received from MPSTDC

Sr. No.	Comments / Suggestions	Remarks
1	Change the area of Hilltop Bunglow in Sr. No.8 of Annexure 13.1 to 32510.02 Sqft.	Noted. Incorporated in Annexure 13.1(Page no. 107)
2	Kindly include the location of Eco-Center at Dhasai with area of 406728.00 Sqft. With Coordinates of N 22°19'56.24" and E 077°57'07.22" in Existing infrastructure of MPTB.	Noted. Incorporated in Annexure 13.2(Page no. 109) and Figure No. 13.2 of Part -2 (Page No. 299)

Table 9- 14: Compliance Report for comments received from PCCF (Wildlife)

PAGE NO.	Comment / Suggestion	REMARKS
	Most of the maps included have very small legends that are mostly illegible.	Noted. A set of 1:4000 maps to be submitted in final submission for references.
Page-2	Satpura Tiger Reserve instead of Satpura Tiger Reserves	Noted. Incorporated in section 1.1.1. (Page No.-2)
Figer 1-12	Grazing lands in the STR. Should be renamed Suitably. Grass lands inside Bori (Relocated villages) are shown in the map. Need to differentiate between grazing lands where village cattle graze and Grasslands within the forest, especially those in relocated village sites.	Noted. The map has been prepared with reference to Annexure M21 of Forest Buffer Plan of Satpura Tiger Reserve. The title of the map has been changed from grazzing land to grazzing pressure in Figure 1.12. (Page No.-19)
Table 1-64 table 1-7	Can change the heading from 'Visiting Date' to Date of visit.	Noted. Incorporated in Table 1.6 and 1.7 (Page No.-21 to 24)
Fig 1-14	Village survey form not legible. Should include in Annexure.	Noted. The Village Survey form is already provided in Annexure 1.2 in Part-3 (Page No.-4)
Fig. 1-6	The title needs to be relooked and suitably amended.	Noted. Incorporated in fig. 1.6 (Page No. 12)
Table 2.1	Please Check year of Capt. James Forsyth's visit to Pachmarhi. Should be 1862 and not 1857. Dates of formation and number to Preservation plots needs to be rechecked.	Noted. Incorporated in table2.1 of section 2.1.1 in Chapter 2 of Part-1 (Page No. 28). Details of preseravation plots has been modified as per Forest Buffer Plan in section 2.7.6 of Chapter 2 of Part 1. (Page No. 44)
2.8.3.	Should use the term Gaur instead of Bison and Check spelling of Nilgai.	Noted. Modification incorporated in section 2.8.3 of Chapter 2 in Part -1. (Page No. 46)
	Central Profile Included is a section on Baiga. There are only Gond and Korku tribes in the area. Section to be suitably Changed.	Noted. Modification incorporated in section 3.6.1 of Chapter 3 in Part -1. (Page No. 73)
5.2.1.1	2- Relook Should be 'An accessible'.	Noted. Incorporated in section 5.2.1.1 of Chapter 5 in Part-1. (Page No.-161)
5.3-	Table 5.3 Si. No.1 Stepwell instead of steepwell.	Noted. Incorporated in Table 5.3 of Chapter 5 in Part-1. (Page No.-172)
Page-277	Discontinuity between pages 177 and 179. Numbering restarts at 1 after 6 in the previous page 177 Recheck numbering	Noted. Incorporated.
Page 185	5.4.1 -Please correct spelling of Dr. Rajendra Prasad. Also correct to first President instead of first Vice President.	Noted. Incorporated in section 5.4.1 in Chapter 5 of Part-1. (Page No.185)

PAGE NO.	Comment / Suggestion	REMARKS
Page 187	Use Kms for distances instead of miles.	Noted. Incorporated in section 5.5 in Chapter 5 of Part-1. (Page No.187)
Figer 5.49	Specific Tiger name may be dropped.	Noted. Incorporated in Figure 5.49 in Chapter 5 of Part-1. (Page No.187)
5.5	The description of Rock Art needs to be redrafted in order for it to be easily Comprehensible. The rock painting is located mostly in rock shelters and not in caves as mentioned.	Noted. Incorporated in section 5.5 in Chapter 5 of Part-1. (Page No.186)
Page-192	Infrastructure Profiling Since most of the sites included in the ESZ are natural sites, one of our objectives should be to maintain its state of wilderness and not seek to construct infrastructure like change rooms and toilets at all the sites. This is also because many sites are adjacent to each other and suitable planning can be done to provide the basic amenities while keeping the natural character of the site intact.	Noted. The analysis for the available tourism infrastructure as per standard requirement has been analyzed. The objective has been considered in suggestive proposal for tourism infrastructure in section 13.8 of Chapter 3 in Part-2. (Page No. 349)
7.8.5	Limited meadows. The Statement "STR have on only 4 small meadows" needs to be relooked.	Noted. The data has been reffered from section 3.11.2 of forest buffer plan of Satpura Tiger Reserve.
Table 10.1	Land use codes not explained. The cluster wise proposals for 14 clusters especially the proposed land use needs to be vetted by the Field Director, STR again if required.	Noted. The Land use codes are mentioned in section 10.4.2. (Page No.). The Proposed Land use has been briefly discussed with the Field Director, and comments received vide letter no. 1. DM/5169 from FD, Satpura Tiger Reserve dated 15/07/2020 mentioned in Annexure- 17.2 (Page No.209) 2. SAI/BAUP219009/HO/0819/2021 Minutes of Meeting of discussion with FD, STR dated 4/05/2021 and 12/05/2021 mentioned in Annexure - 17.2 (Page No.215)
Page-116	Complete break from the last page Description of Darjeeling Botanical Garden is inserted without context	Noted. Incorporated in section 10.6.2. (Page No.116)
11.5	Wast water treatment	Pachmarhi has the existing facilities of landfill site and door to door collections for solid waste management. The same has been mentioned in section 11.6. (Page No. 164)
11.6	Solid waste Treatment	
	No plan for Pachmarhi where the current system is inadequate. Need for a good section detailing water and solid waste treatment measures.	