





STAGE III REPORT JANUARY 2011

Environment Management Plan for the Geo Thermal Zone of the Tansa River Basin

DESIGN CELL – KAMLA RAHEJA VIDYANIDHI INSTITUTE FOR ARCHITECTURE AND ENVIRONMENTAL STUDIES

ACKNOWLEDGEMENTS

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Project Sponsored by

MMR - Environment Improvement Society

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List of Abbreviations

MMRDA- Mumbai Metropolitan Regional Development authority

RTDZ- Recreation and Tourism Zone

EGS- Employment Guarantee Scheme

JFMC-Joint Forest management committee

MMR- EIS Mumbai Metropolitan Region – Environment Improvement Society.

CHAPTER 8 INTRODUCTION TO STAGE 3

8.1 Introduction/ Summary of findings from stage one and two of the study

The study began with a concern for the environmental consequences of tourism and other related activities around the thermal springs located in the area of study.

- The first part of the study looked at developing an understanding of the larger environmental systems within which the area of study i.e. the proposed RTDZ lies. The study understood the environmental systems at two scales-the first stage looked at the entire Tansa River Basin, while the second looked at the Influence zone (consisting of an area of 122 sq. kms.)of the Recreation and Tourism Development Zone (RTDZ) and the Core Zone consisting of RTDZ and surrounding villages with approximately 9500 persons with an area of 18.78 sq kms.
- It became apparent that as the geo thermal activity in the area is a manifestation of the extensive, geological processes and formations, it is difficult to ascertain present or predict future stresses posed by human intervention to the existence of the hot springs. However, of immediate concern is the threat of the privatization of thermal springs which should remain within the public domain as they are unique environmental and cultural assets.
- The second part of the study analysed the Core Zone in detail and identified the issues and concerns regarding the same. It established the lack of local participation in the tourism economy as well as a decline in the opportunities for other existing local economies such as agriculture. This also has led to the lack of interest within the local communities in managing the immediate environmental resources. It has been observed in the villages of Akloli and Ganeshpuri local farmers are selling off farmland to private commercial interests.
- It also identified that the primary threats to the environmental systems emerged from a lack of infrastructure and resource management at the local level to deal with the loads due to tourism.
- The study therefore also included an understanding of the institutional structures that were involved in managing development and infrastructure within the Core Zone.

Therefore, as a broader strategy, the study in stage 3 formulates an idea of the environment that is connected to the lives of people who inhabit and work within it. It suggests environmental initiatives that should be localized, emerging from the interaction of communities and the environment instead of creating top-down policy frameworks. In such a management plan, environment management could be combined with economic benefits and opportunities, infrastructure development and area improvement programmes for the benefit of local communities.

Broad strategy for framing recommendations

The other objective of this study is to identify projects and practices which would help in improving/protecting the environment as well as managing economic activities such as agriculture and tourism in a sustainable manner so that they can simultaneously benefit the local populace as well as the environment. Water harvesting projects that benefit both the environment as well as the agrarian economy, or eco-tourism projects involving the local community are examples of such practices. These projects can be ongoing projects which can be implemented even without a master-plan.

There are examples of such local and environmental initiatives that have been successful in many locations in India. In the context of Maharashtra both these approaches have been adopted with differing results. The case of the top-down approach has been tried in Matheran and Mahabaleshwar where through a Central Government notification both were declared as Eco-Sensitive Zones. In these cases most of the environmental policy was prepared without any local participation, which in some cases have led to opposition from local populace and local governments as reported by a study conducted by Dr. Ankur Patwardhan from RANWA[1]. This can be contrasted with local effort done in Hivre Bazar, Amhednagar, Maharashtra to improve the conditions for farming through a ground water management plan. In this case under the Joint Forest Management Committee and Employment Guarantee Scheme water and soil conservation works were taken up. Being a local initiative it was very successful in implementation of the project. The needs of the community were addressed through a project for environmental management. Another example of sensitive local efforts is seen in the eco tourism model being experimented with in Wapha in Shahpur forest division, Thane District, Maharashtra through the participation of the Joint Forest Management Committee where the tribal communities and Forest department manage eco-tourism programmes. In both the case in Maharashtra local government agencies, communites and community based organization have collaborated to achieve success. This study bases itself in similar methodology.

An important argument that the study makes is that environmental resources are a public resource and have to be protected as such. In tourism zones, very often as has been observed in the three villages, access to environmental resources becomes exclusive as they are privatized by resorts/spas/health clubs. The study seeks to protect public access to environmental resources.

8.2 Scope of the study

The third stage of the study lays out the strategies for protecting environmental assets, managing tourism and increasing local participation in the above mentioned activities. As has been already mentioned, this is not an exercise in preparing a development plan, but the strategies detailed here could be used to prepare or incorporated in a sensitive development plan / master plan or a tourism development plan for the region. An attempt to prepare a tourism development plan was initiated by the Collector of Thane, in 2003, and later aborted. This study assumes that such a process to prepare a master plan for the entire Zone shall be restarted

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by the State Government. During this process the strategies laid down in this study would be incorporated. This master plan shall be published by following a procedure similar to that prescribed under the Maharashtra Regional and Town Planning Act 1966. The procedure to be followed has precedence in two hill station of Maharashtra, one in Mahabaleshwar and the other in Matheran. Both were declared eco-sensitive zone, (Mahabaleshwar (2001), Matheran(2003)) through a notification from the Central Government, Ministry of Environment and Forest. However in the case of the Core Zone, the study suggests that the procedure should vary as the initiative to recognize it as a sensitive environmental zone should come from the local level as well as the state level rather then being initiated by the central government agencies. For this we believe that the MMR-EIS can play an important role as they can suggest to the State government to prepare a master plan for the area in consonance with the findings of the study.

Apart from informing the development plan, the study proposes projects and practices that benefit local economies and the environment. As these projects are small community-driven activities, they can be implemented immediately without the development plan.

8.3 Case studies

For the preparation of recommendations, relevant case studies were identified in similar contexts within Goa and Maharashtra. Some look at local development initiatives in Maharashtra that also effect environmental management. Some of the case studies deal with examples of environmentally sensitive tourism initiatives to do with thermal springs specifically in Himachal Pradesh

The cases that were studied are:

1. Vashishta, in Manali in Himachal Pradesh where provisions for the protection of the thermal springs while providing modern facilities such as bath houses showers, changing rooms and restaurants for tourists were made.
2. Hivre Bazaar in Ahmednagar Maharashtra with 217 households and total geographical area of 976 ha [about 500 ha is arable] and 70 ha of forestland (http://www.rainwaterharvesting.org/rural/Hirve.htm) was studied for innovative environmental projects initiated by communities which also strengthened the local economy. These projects cover, rainwater harvesting, afforestation projects, as measures to augment agriculture.
3. Wapha village in Shahpur, Maharashtra for its implementation of eco-tourism projects involving tribal communities.

8.4 Structure of the Proposal

The proposal would we divided into the chapter listed below.

- **Management and Protection of Environmental Assets in the Influence Zone**
    1. Protection of hot-springs
    2. Watershed management and restoration plans
    3. Protection of Critical Slopes
    4. Forest protection especially in fringe areas.
- **Regulation and Control of Activities arising out of Tourism**
    1. Additional controls on zoning
    2. Augmentation of existing building regulations
    3. Traffic Management Plan
- **Augmentation of existing infrastructure- water, solid waste, sanitation and storm water.**
- **Augmentation of the agrarian economy .**
- **Augmenting the tourism economy for local communities**
- **Summarizing regulations identified in the earlier sections**
- **Prioritizing Projects identified in the earlier sections**
- **Creating an Institutional framework for implementation**

Chapters 8 and 9 which deal with the management of environmental assets and tourism would deal with setting up a set of guidelines which could be incorporated while making the master-plan. Also a set of projects would be identified which can be pursed independently by government and private agencies to achieve the above objectives. The study will indicate the various agencies who could initiate such projects. Chapters 10 , 11 and 12 would identify projects which would help in augmenting the infrastructure as well as the economy. Chapter 13 and 14 would deal with summarizing the regulations, prioritizing the projects that have been identified and chapter 15 proposes the creating a local institutional framework that would help in implementing the project.

CHAPTER 9 PROTECTION AND MANAGEMENT OF ENVIRONMENTAL ASSETS IN INFLUENCE ZONE.

9.1 Protection of geothermal resources

For the protection of geothermal resources, a policy framework needs to be prepared, as no protection policies exist for these unique assets. In the earlier part of the study, three conditions were identified within which the thermal springs exist

1. Thermal springs under the ownership of the Gram Panchayat
2. Thermal springs under the ownership of private trusts
3. Thermal springs in private properties

The following are the guidelines laid out for the protection of the thermal springs

1. Public access around hot springs.

There should be public access which is provided to each of the hot-springs, especially the hot-springs that are now under private and trust ownership. For the protection of these springs the study suggests that public access should be provided to these springs as well a buffer of 3 metres around them *Fig.1* However, the development rights on private/trust property will remain as that on the whole plot i.e including the land that gets consumed for public access and the buffer zone.

2. Regulation of activities like public washing, bathing surrounding public hot-springs

Existing activities such as public common washing, bathing, in and around hot springs that lie along and within the river beds need to be prohibited. For these purposes separate structures which have adequate provisions for waste water treatment which include bathing areas must be built . *Plate. 9.1* shows possible ways of locating, designing bathing areas. The Vashista bath complex at Manali serves as an example to evolve a typology for the bath complexes. (See fig 8.3) Here there are two types of baths, some public and free and others private and paid for. The paid for baths charge Rs 35 per half hour.

The regulation of activities and management of these thermal springs and related bathing/washing structures within the CORE ZONE should lie with the Gram Panchayat for which they should be allowed to charge tourists for the use of these facilities. The shops and commerce related to the thermal springs and tourist activity that now encroach on the river bed must be removed and can be incorporated into these structures, as shown in *Plate 9.1* . Also for hot-springs located outside the river bed, similar structures for washing and bathing should be built.

3. Regulating Construction around hot springs.

The use of material used in construction of enclosures around hot-springs in the river bed should allow for percolation of water *Fig 2*. Thus concrete as a material of construction should be avoided. Instead locally available material such as stone which allows for percolation of water should be encouraged. Some examples of possible construction solutions have been shown for hot-springs located in Akloli and Ganeshpuri.

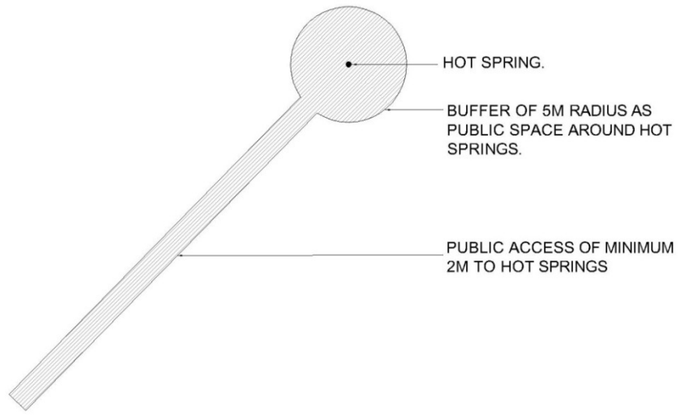


Fig. 8.1 Guidelines for locating and designing wash areas around thermal springs

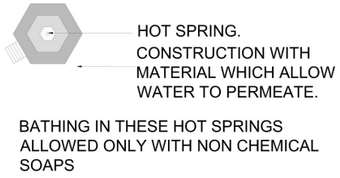


Fig. 8.2 Guidelines for Construction around hot springs.

Fig. 8.3 Vashishta, enclosed baths at Manali

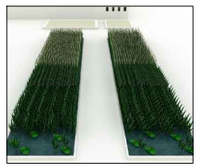
Bath house complex with Hot Water Bath, gardens and restrooms.

Waste water from restrooms.

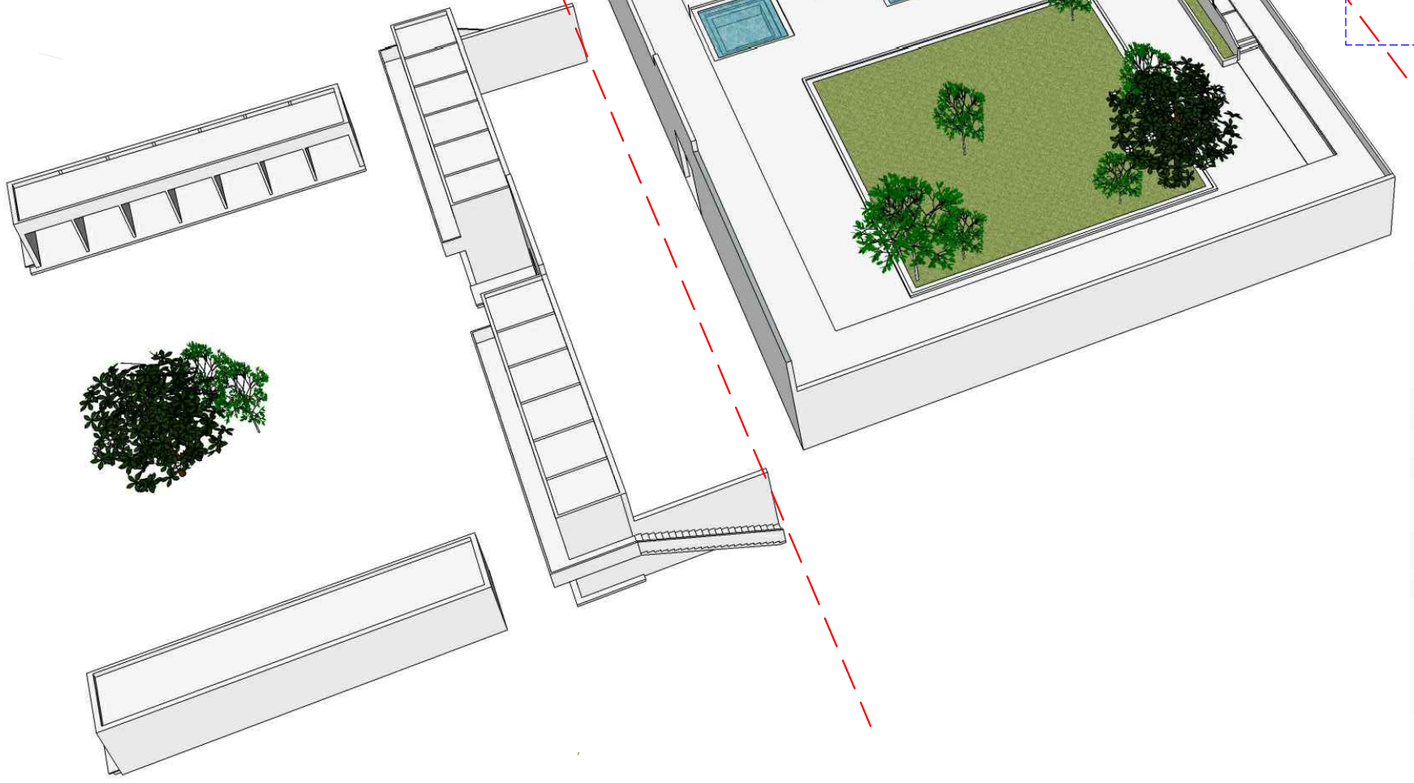
Treated water used for landscape purposes.

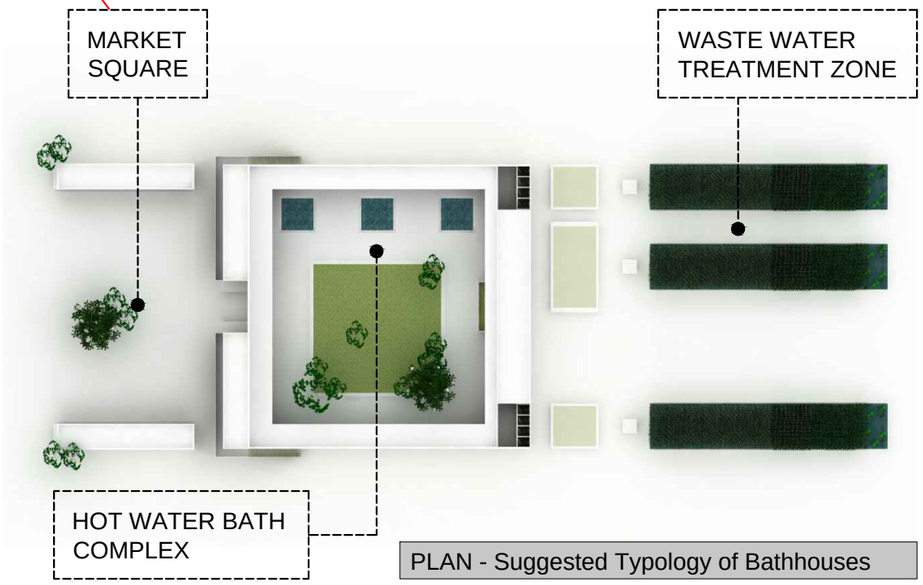
Market Square with shops

Reed Bed Root Zone Treatment for waste water



Waste water from hot bath cooled and treated before red beed treatment.





PLAN - Suggested Typology of Bathhouses

The baths around the springs can be organised into three zones. All the commercial activity which is removed from the river bed can be accommodated in the market square, the bath enclosure and the treatment zone.

9.2 Protection of Rivers and Streams

In the Influence Zone the river and the streams within the watershed are edged by varying conditions. Some portions of the river are edged by settlements while others by forests and agrarian lands. In this section the study will formulate protection policies that address these various conditions. The river edge from Akloli to Ganeshpuri *(Refer Plate no. 9.2,9.3, 9.4*) which has all the representative conditions will be examined in greater detail to formulate policies. Irrespective of these various conditions, it has been established that the riparian zone of 10 metres for river edges and 5 metres for streams need to be protected (which corresponds to the average extent of riparian vegetation). This will create the connective corridors of vegetation extending from the source of the streams within the forests to the riparian zone of the river as illustrated in *Plate 9.2*.and the diagrams indicating connectivity of stream and river corridors with forest lands. The river edges should be as shown in the CTS maps of the villages. The specific policies for the various conditions are detailed here as follows.

Policies and Proposals for River Edges adjoining settlements

1) The unbuilt areas within the riparian zones along existing settlements have to be mapped with the help of the Gram Panchayat and reserved as unbuildable zones. There should be no further building activity permitted within this designated riparian zone. If there are private landholdings within the riparian zone of the river while the private property remains in the possession of the existing owners, the construction of permanent structures for habitation in these areas should not be permitted. No activity which obstructs the natural drainage of water should be allowed in these zones.

2) Along the bank of the river demarcated as the riparian zone, no permanent construction which alters the natural conditions of the river beds should be allowed. However religious and recreational activities which are temporary in nature could be allowed within this zone. The riparian zones along settlement edges should not be used for sand dredging as these edges being settlement edges can be used as public spaces.

3) There should not be any dumping of raw sewage into the streams and rivers. If there is any such existing plots/owner/ dumping raw sewage or water generated from washing, bathing, toilets, they should use alternative waste water treatment technologies such as phyto-remediation, before releasing it into the river.

4) Any washing activity along these portions of the river should be allowed only within the riparian zone of the river. Structures for washing as shown earlier should be light in nature and should not let waste water discharge into the water without proper treatment such as reed beds or phyto-remediation ponds.

Policies and Proposals for River Edges adjoining agrarian land and forests.

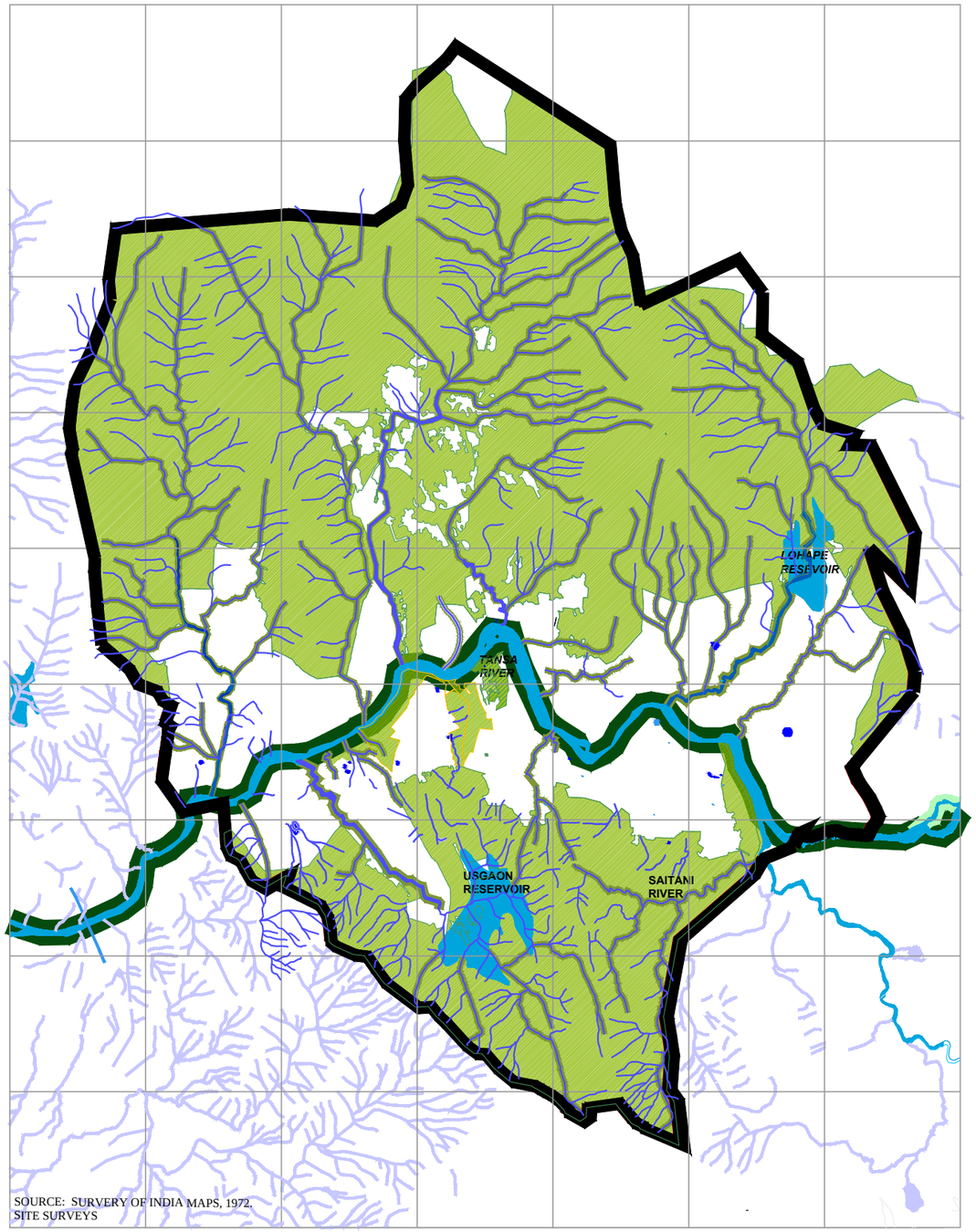
1) These are the only edges where sand dredging can be permitted in a controlled manner. This activity should be controlled by allowing a fixed number of licenses every year. Also dredging during monsoon months should be discouraged to allow the riverbed to be replenished. Only manual sand dredging should be permitted within the CORE ZONE. No heavy vehicles should be allowed access to the river bed.

2) Any washing activity along these portions of the river should be allowed only within the riparian zone of the river. Structures for washing as shown earlier should be light in nature and would not let the waste water discharge into the water without proper treatment. (Refer *Plate no. 9.5*) for suggested systems for the construction of wash areas and bathing areas.

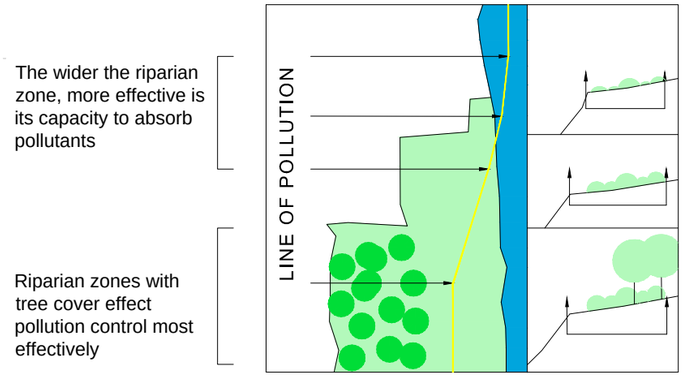
Policies and Proposals for River Edges streams within and along settlement edges

1) No building construction activity should be allowed on streams even if they are in private property. Natural streams should not be diverted or tampered with.

2) For all the watersheds for the river which have been documented and mapped, a detailed restoration plan should be prepared. These plans should clearly identify the width of the stream, demarcate the riparian zone and explore the possibilities of making check dams along the stream. Already certain streams have had check dams built on them.

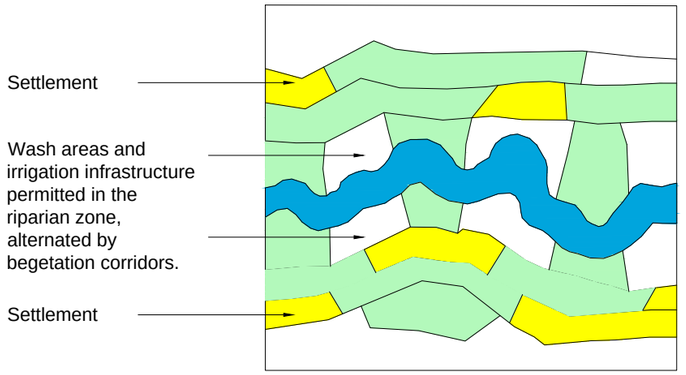


SOURCE: SURVERY OF INDIA MAPS, 1972,
SITE SURVEYS



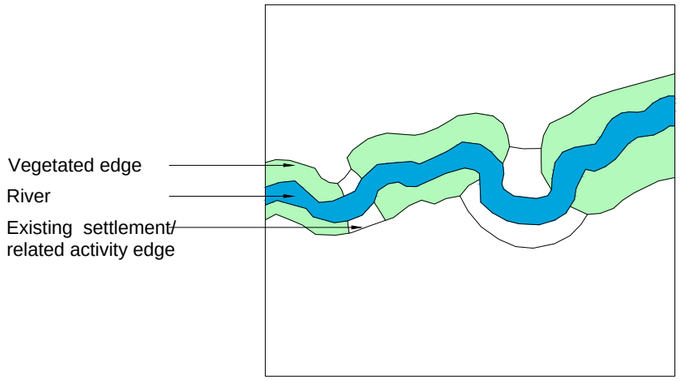
STREAM AND RIVER CORRIDORS

The riparian vegetation acts as a natural filter, filtering out substances such as nitrogen, phosphorous and toxins from enetring the stream corridor
Contact with plant stems and litter slows water movement
Plant roots absorb dissolved sustances
Clay particles hold dissolved substances
Soil organic matter absorbs dissolved substances.



CORRIDOR WIDTH FOR A RIVER

The diagram indicates the "LADDER-PATTERN" of vegetation that is required to ensure to maintain a hydrologic sponge, trap sediment during floods and provide soil organic matter for the aquatic food chain, logs for fish habitat and habitats for floodplain species. as well as preferred intensities of landuses along the buffer layers established.
The vegetation corridors must extend across the river to ensure continuity.
Within the proposed riparian zones around streams and rivers only structures for washing and irrigation infrastructure may be planned alternated by corridors of vegetation as shown.



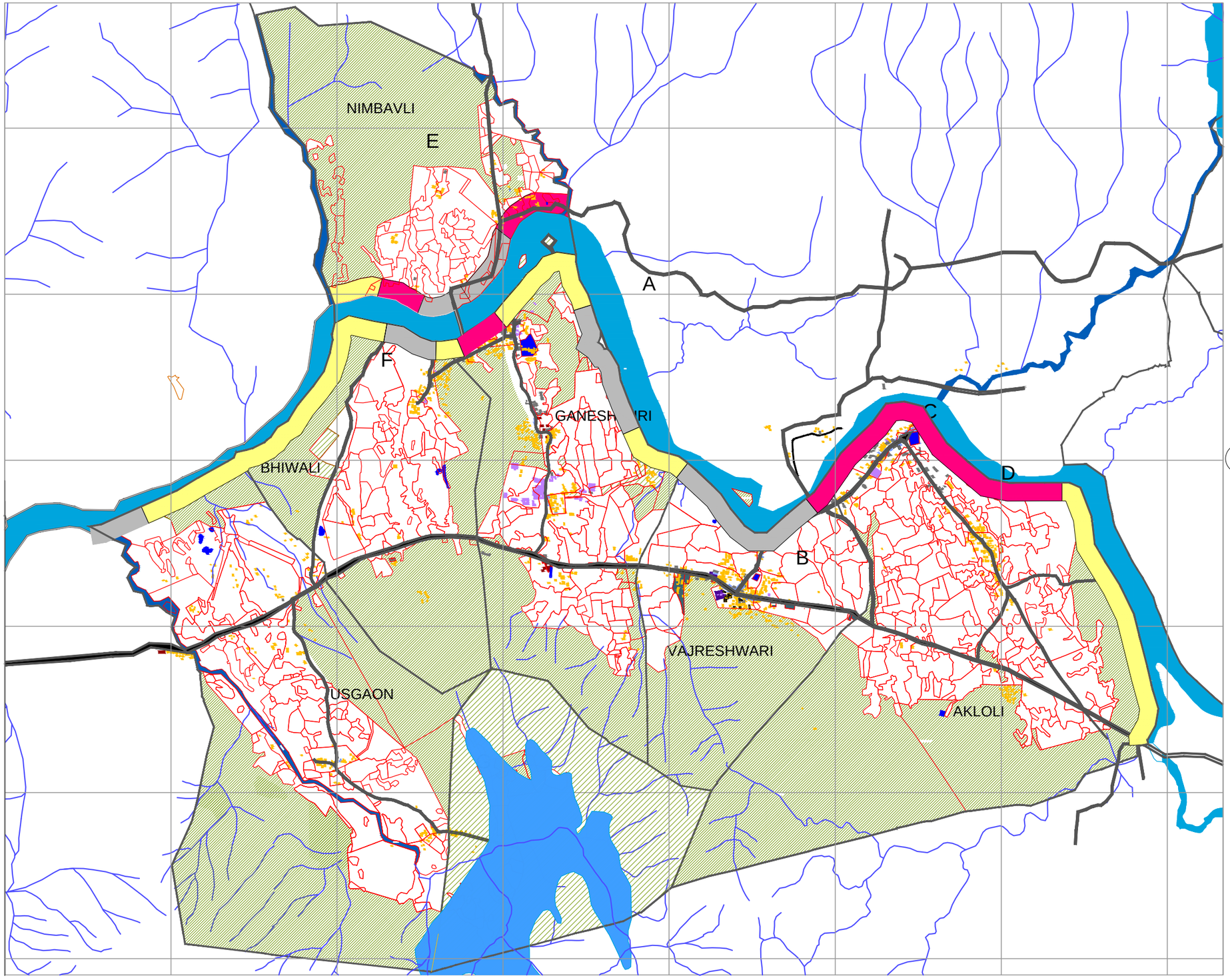
CONNECTIVITY OF A STREAM CORRIDOR

The diagram indicates the pattern of vegetation and settlement along rivers in the absence of the possibility of an ideally continuous vegetated stream corridor.

The drawing to the left indicates a belt of natural riparian vegetation along either side of the smaller streams and the river observed from site visits as being approximately 5 metres wide on either side of the smaller streams and 10 metres wide along the banks of the Tansa River. The protection of the riparian zones will create the ladder effect or continuity of corridors across the river and settlements as shown in the above diagrams.

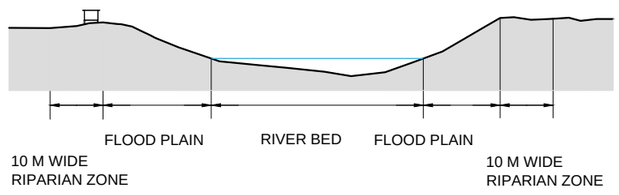
LEGEND:

- RIPARIAN ZONES ALONG MAJOR RIVERS
- RIPARIAN ZONES ALONG STREAMS
- INFLUENCE AREA
- STREAMS WITHIN CFA
- TANSA RIVER
- STREAMS OUTSIDE CFA
- LAND UNDER FOREST OWNERSHIP



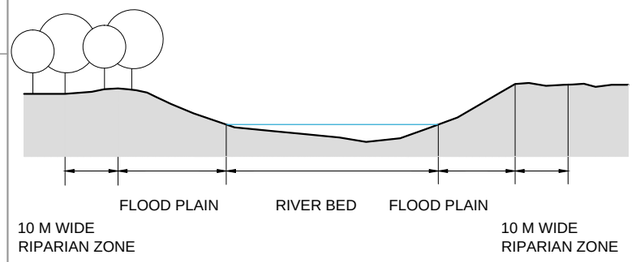
RIPARIAN ZONE CONDITIONS

1) WITHIN AGRICULTURAL LANDS



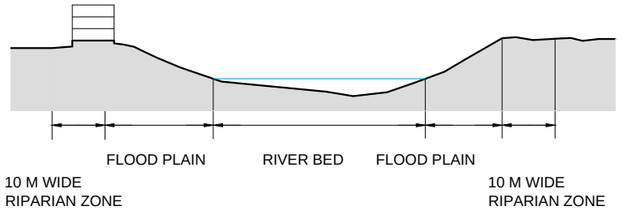
Light structures for washing may be permitted within the riparian zones within agricultural lands.

2) WITHIN FOREST LANDS



No construction should be permitted in the riparian znes within forests.

3) WITHIN SETTLEMENT AREAS



Settlement edges within riparian zones have to be surveyed and frozen so that no further encroachment into the river bed as well as construction within the riparian zone takes place.

LEGEND:

- SETTLEMENT EDGE TO RIVER
- FOREST EDGE TO RIVER
- FARMLANDS EDGE TO RIVER
- FOREST AREA
- TANSA RIVER
- STREAMS
- WATER BODIES
- CTS BOUNDARIES
- VILLAGE BOUNDARIES

RECOMMENDATIONS: CORE ZONE: DEMARCATION OF DIFFERENT RIVER EDGE CONDITIONS

0 200 500 1000 M

9.3

ENVIROMENT MANAGEMENT PLAN FOR THE GEO-THERMAL ZONE OF THE TANSA RIVER BASIN, 2008, DESIGN CELL- KAMLA RAHEJA VIDYANIDHI INSTITUTE FOR ARCHITECTURE AND ENVIRONMENTAL STUDIES, JUHU SCHEME, VIDYANIDHI MARG, JUHU SCHEME, MUMBAI - 400069, website:www.krvia.ac.in

NIMBAVLI

GANESHPURI

VAJRESHWARI

AKLOLI

USGAON

The built-up or settlement edges along the river as indicated in red have to be surveyed and established so that no furtherpermanent encroachment or construction within the riparian zone is permitted.

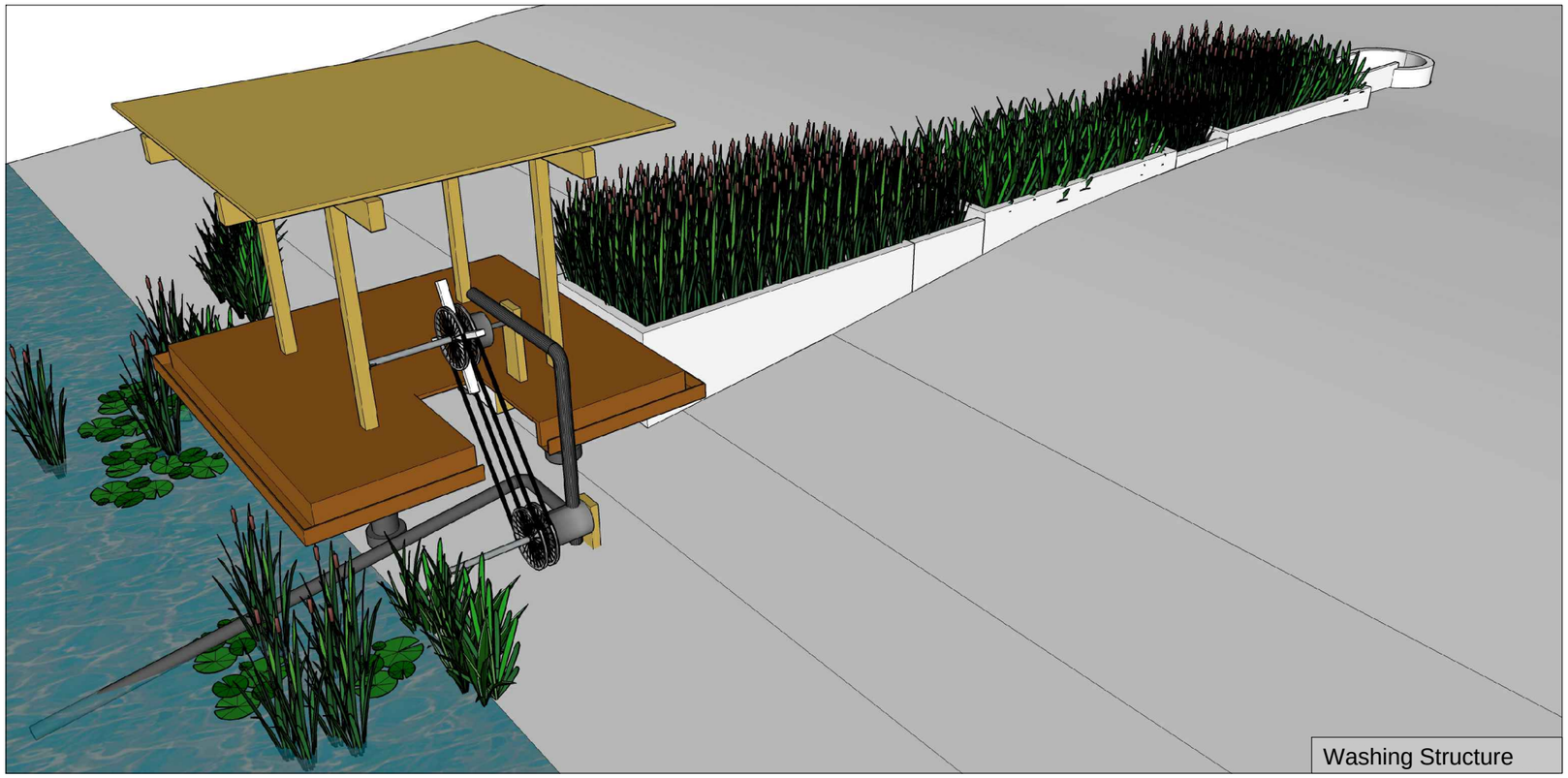
LEGEND:

- EDGES TO BE SURVEYED
- RESIDENTIAL
- COMMERCIAL
- TEMPLES, TRUSTS AND TRUST RELATED BUILDINGS
- RESORTS /LODGES
- ABANDONED LODGES
- PUBLIC AMENITIES
- INDUSTRY
- FOREST AREA
- VILLAGE BOUNDARIES
- STREAMS
- CTS BOUNDARIES
- WATER BODIES
- TANSA RIVER

RECOMMENDATIONS: CORE ZONE: DEMARCATION OF RIVER EDGES ALONG SETTLEMENTS

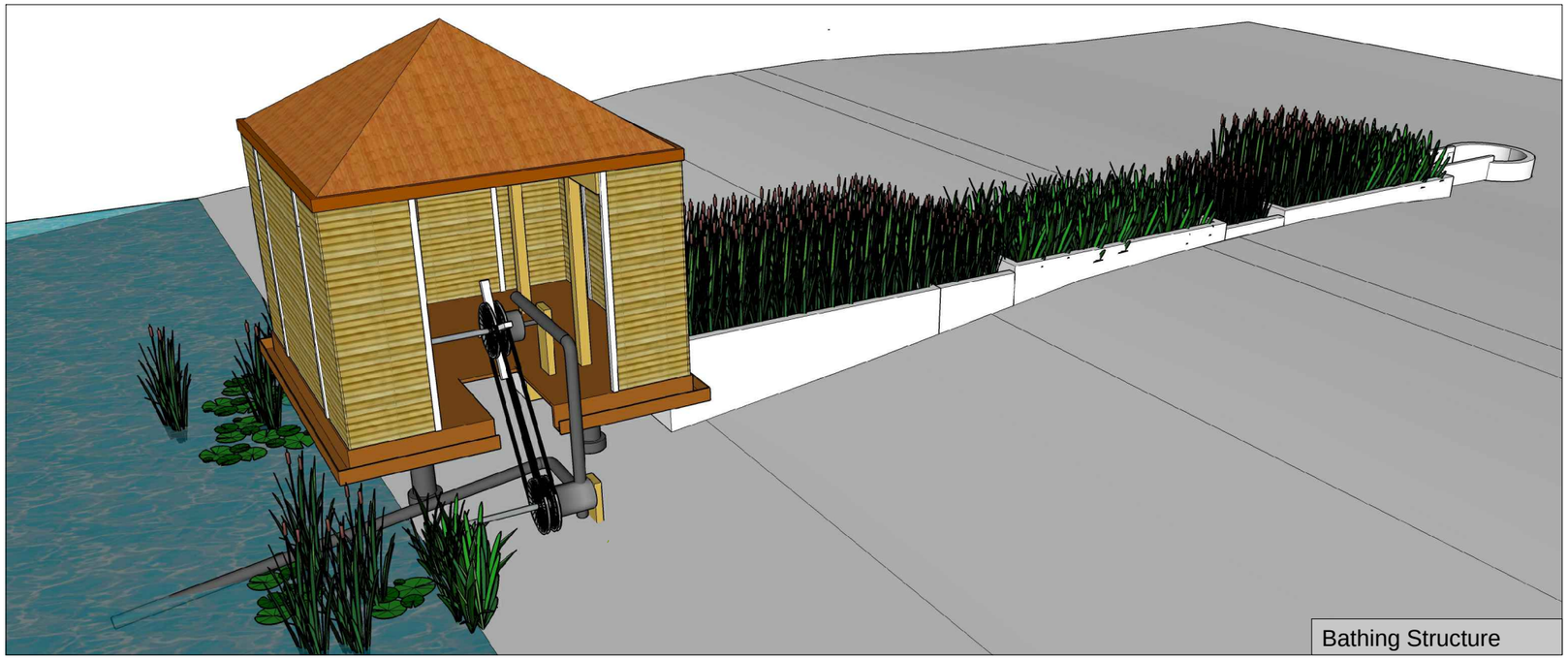
0 500 1000 M

9.4

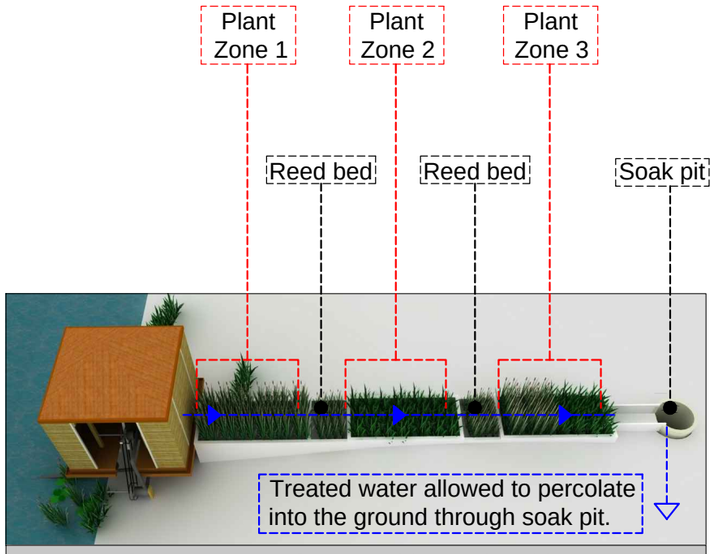


Washing Structure

Mechanism for drawing water from the river



Bathing Structure



Treatment for waste water form Washing and Bathing sturctures

Any washing activity along these portions of the river should be allowed only within the riparian zone of the river. Structures for washing as shown earlier should be light in nature and would not let the waste water discharge into the water without proper treatment.

The plates describes with examples such washing and Bathing structures built along with waste water treatment in form of a reed bed system.

9.3 Protection of Critical Slopes.

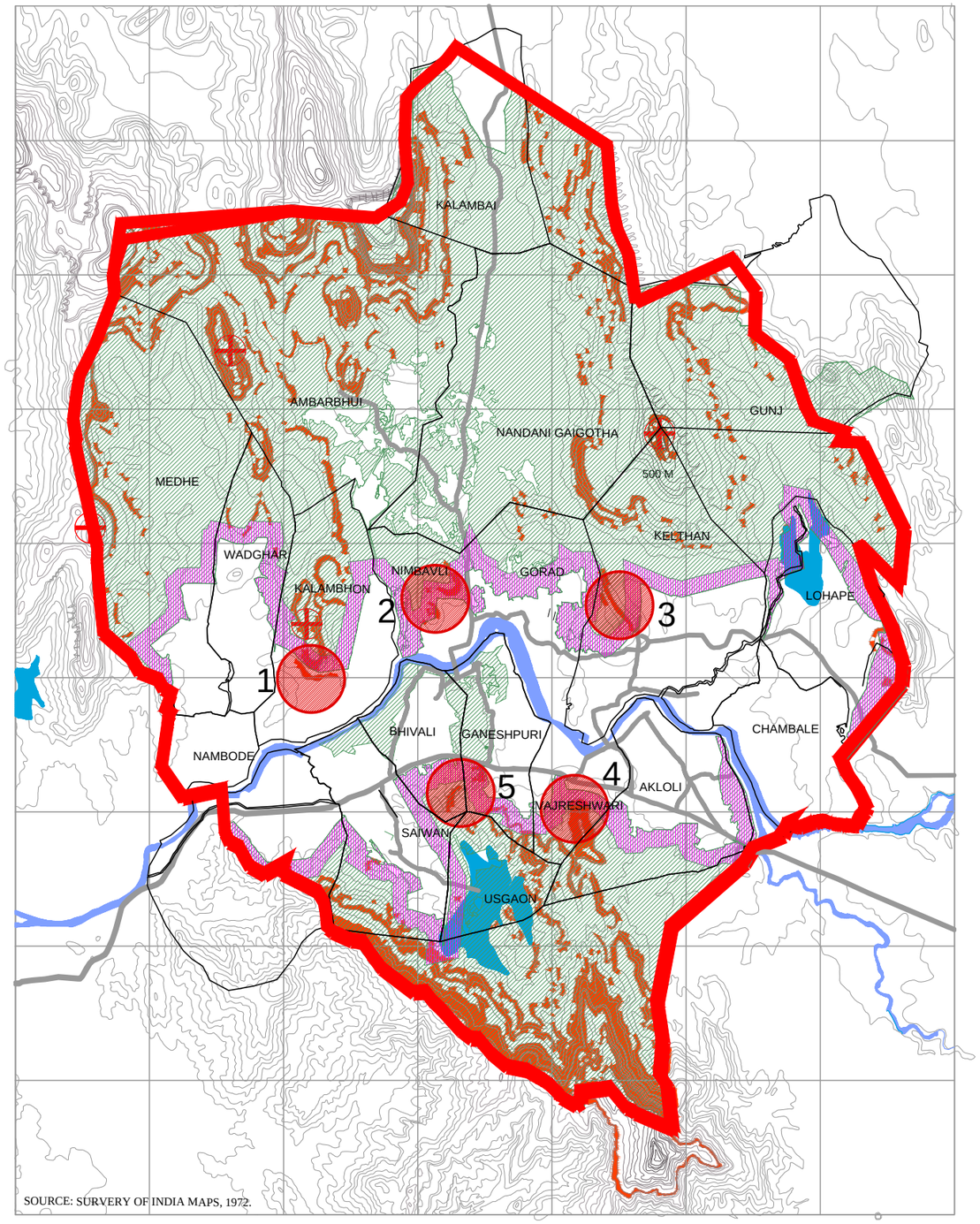
The critical slopes in the Core and Influence Zone are located within lands under the ownership of the Forest Department. The Forest Department has an afforestation plan which has to be implemented by them. However, as seen in the (*Plate no 9.6*) there are some critical slopes which lie on the edge of the forest near habitable areas.

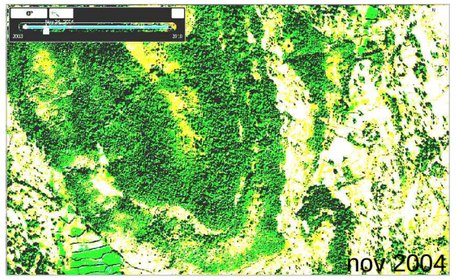
These critical slopes which are under maximum threat need to be addressed immediately through the following measures:

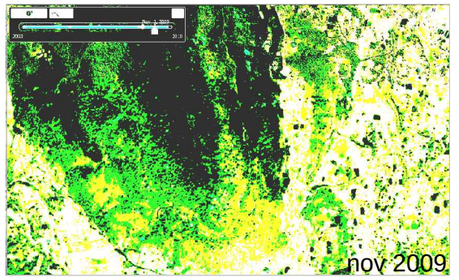
1. Afforestation programs should be carried out on these threatened slopes. The Forest Department has afforestation program in the forest management report prepared for the forests of this region which should be implemented immediately.

2. There is an opportunity to improve local level participation in implementation of existing policies of the Forest Department through the Joint Forest Management Committee. Such local level participation as has been seen in other parts of the state[2], have been very successful in both effecting local economic needs as well as conservation of forests, combining agro-forestry schemes with afforestation schemes.

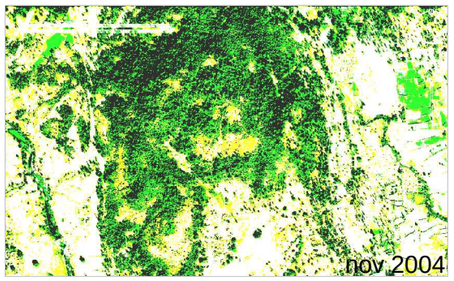
[2] See Chapter 12.1 for case examples of such projects initiated in Maharashtra.

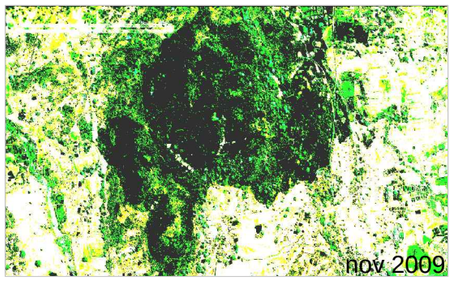




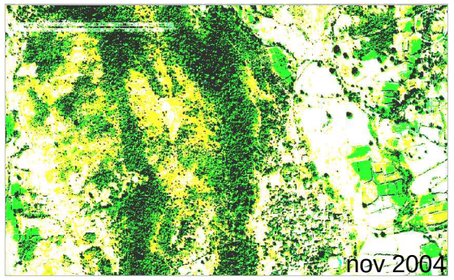


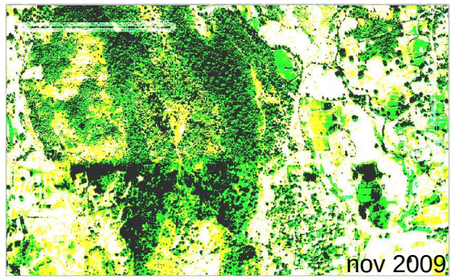
1
Village Kalambhon
Shows deforestation





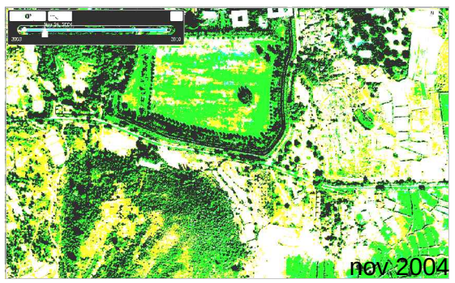
2
Village Nimbavli
Shows deforestation

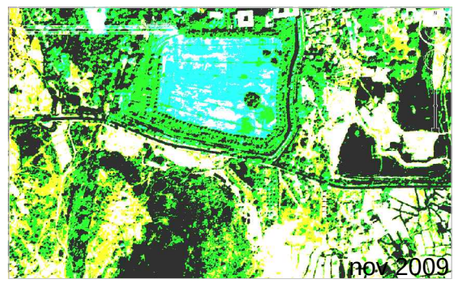




3
Village Kelthan
Shows no disturbance

4
Village Vajreshwari
Shows deforestation





5
Village Usgaon
Shows deforestation

Afforestation programmes for the threatened critical slopes suggested for immediate afforestation programmes through the joint Forest management Committees

LEGEND:

- LAKES
- RIVERS
- AREA UNDER FOREST OWNERSHIP
- 2 KMS WIDE IMMEDIATE PERIPHERY OF FOREST VULNERABLE TO DISTURBANCE
- SLOPES >20 DEGREES
- CRITICAL FOCUS AREA BOUNDARY
- ROADS

RECOMMENDATION: INFLUENCE ZONE: AFFORESTATION OF THREATENED CRITICAL SLOPES

00 01 02 04 KM

9.6

ENVIROMENT MANAGEMENT PLAN FOR THE GEO-THERMAL ZONE OF THE TANSA RIVER BASIN, 2008, DESIGN CELL - KAMLA RAHEJA VIDYANIDHI INSTITUTE FOR ARCHITECTURE AND ENVIRONMENTAL STUDIES, JUHU SCHEME, VIDYANIDHI MARG, JUHU SCHEME, MUMBAI - 400069, website:www.krvia.ac.in

9.4 Protection of Forests

The protection of forest areas should consist of policies at two levels. One is clearly in the fringes of the forest zones around settlements and agricultural lands. The other is for tribal settlements which are located around and within the forests. This can be done through:

Policy for Forest Fringe Areas

1. **Regulation of land use and building construction activities along forest fringes.** No building construction activities should be allowed in a buffer of 25m from the forest boundary. In case of private properties which are located within such zones building construction activity should start 25m away from this zone. Agro-forestry projects within private properties in this zone should be encouraged and permitted. This will aid in achieving the "finger" like edges to the forest which allows for biodiversity as indicated in Plate 9.7

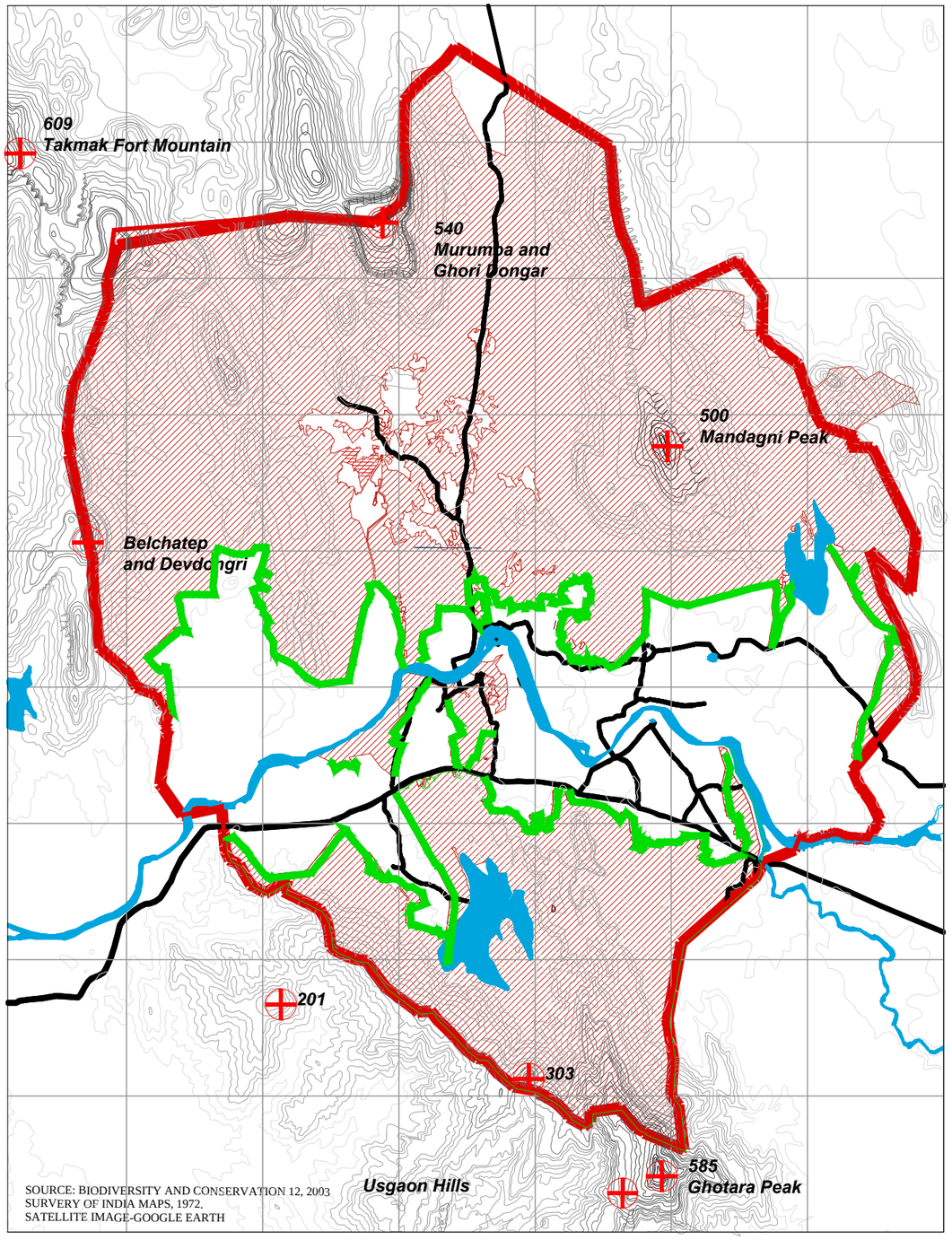
2. In case of agrarian land along fringe areas–alternative agro-forestry schemes should be encouraged through training programs at the level of the Gram Panchayat.

Policy for settlements around and within the forest

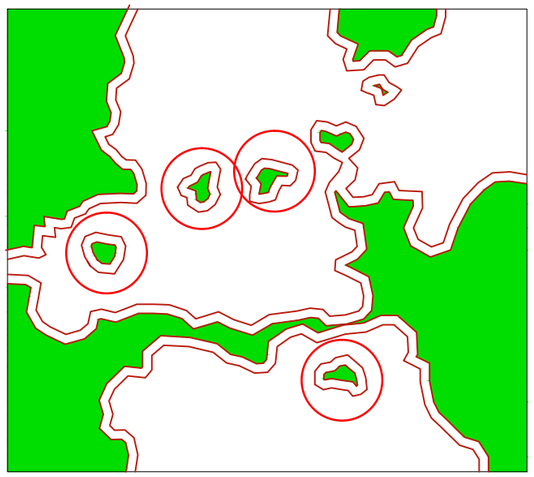
1. In the earlier part of the study a radius of 2 kilometers within forests around settlements was determined as the zone that was most used for the collection of forest resources by villagers. These zones need to be identified as critical zones by the Forest Department and the JFMC for the implementation of afforestation/agro-forestry programs.

In *Plate 9.7, 9.8* indicates pockets and buffers which need to be managed by the forest department and the joint forest management committee and also shows conditions that are ideal for achieving forest diversity that must be used as guidelines for agro-forestry projects.

SUGGESTED CONCEPTS FOR FOREST CONSERVATION IN BUFFER AREAS

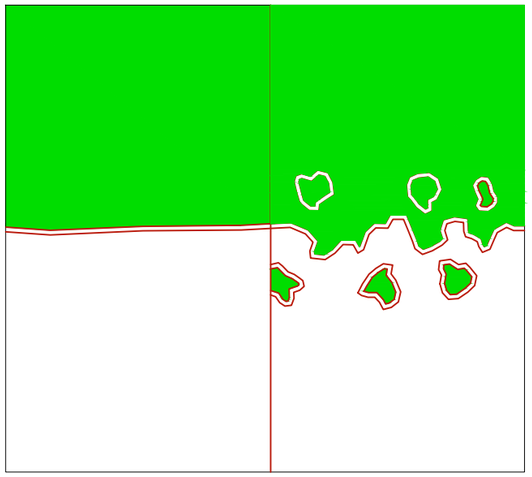


SOURCE: BIODIVERSITY AND CONSERVATION 12, 2003
SURVERY OF INDIA MAPS, 1972.
SATELLITE IMAGE-GOOGLE EARTH



PATCH SELECTION AND CONSERVATION
the selection of patches for conservation should be based on

1) how well the location of a patch relates or links to other patches within the region
2) unusual or disctinctive characteristics e.g. whether a patch has any rare, threatened or endemic species present.



HARD SOFT BOUNDARIES
Compared with a straight boundary between two areas, a curvilinear tiny patch boundary may provide a number of ecological benefits, including less soil erosion and greater wildlife usage.
Encouraging argoforestry in the fringes of forests as shown can help establish a softer and more complex boundary.

The map indicates a 25 metre buffer beyond forest edges where agro forestry schemes may be encouraged. existing forest lands under the joint Forest management committe control should also be used for agro forestry instead of the prevalent rice cultivcation.

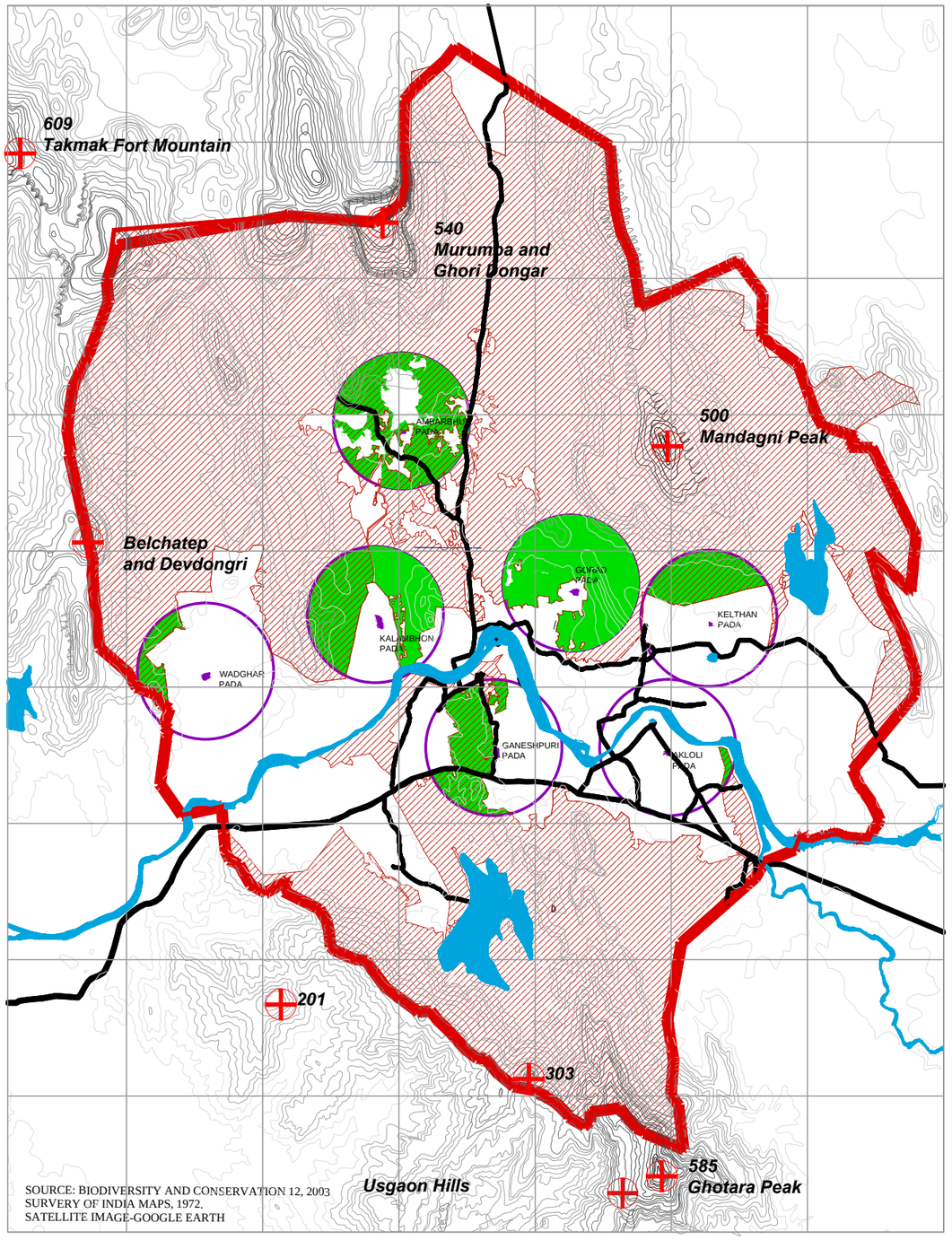
LEGEND:

- PONDS AND TANKS
- LAKES
- RIVERS
- 25 M BUFFER FROM FOREST BOUNDARIES
- INFLUENCE AREA BOUNDARY
- LAND UNDER FOREST OWNERSHIP

RECOMMENDATIONS: INFLUENCE ZONE: FORESTS : AGROFORESTRY IN PRIVATE LANDS

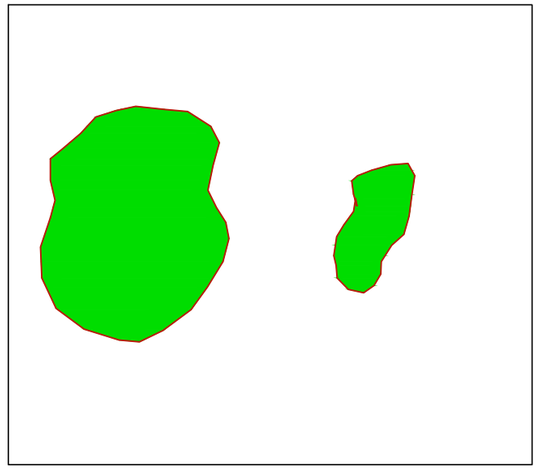
00 01 02 04 08 KM

9.7



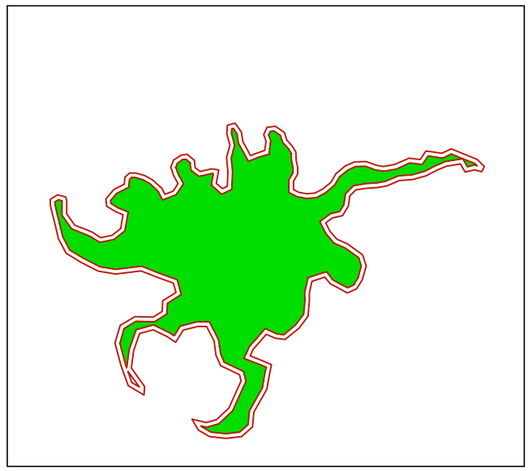
SOURCE: BIODIVERSITY AND CONSERVATION 12, 2003
SURVERY OF INDIA MAPS, 1972.
SATELLITE IMAGE-GOOGLE EARTH

IDEAL CONDITIONS FOR ACHIEVING FOREST DIVERSITY



HABITAT DIVERSITY

A large patch is likely to have more habitats present and therefore contain a greater number of species than a small patch.



ECOLOGICALLY OPTIMUM PATCH SHAPE

An ecologically optimum patch provides several ecological benefits and is generally shaped with a rounded core for protection of resources, some curvilinear boundaries and few fingers for species dispersal.

The riparian zones if protected and vegetated can act as the fingers or corridors connecting patches.

The areas around forests should be demarcated for use of local tribal communities through collaboration of the inhabitants of the villages and the Joint Forest management committee for agro forestry projects.

LEGEND:

- PONDS AND TANKS
- LAKES
- RIVERS
- FOREST AND VEGETATION COVER
- INFLUENCE AREA BOUNDARY
- ADIVASI PADAS
- LAND UNDER FOREST OWNERSHIP
- FOREST AREAS WITHIN 2 KM RADIUS AROUND PADAS THAT ARE VULNERABLE TO HUMAN DISTURBANCE

RECOMMENDATIONS: INFLUENCE ZONE: AREAS FOR JOINT FOREST MANAGEMENT

00 01 02 04 08 KM

9.8

CHAPTER 10 MANAGEMENT AND CONTROL OF ACTIVITIES ARISING OUT OF TOURISM

This chapter deals with the various tourism related activities and issues that require control and management for achieving a sustainable tourism economy.

It includes :

1. Controls on building construction activities that arise out of tourism such as resorts, hotels and commercial establishments.
2. Traffic issues related to festivals.
3. Strategies for improving local participation in tourism.

10.1 Additional controls on zoning and regulating construction activities in such zones

Demarcation of Environmentally Sensitive Areas in the Influence Zone – From the findings in Stage Two some buffer zones have been established in the earlier chapters that need to be incorporated in the zoning plan of the Influence Zone when the development plan is prepared. These zones have to be protected and have certain regulations in place on the nature of construction permitted within them. There are three such zones demarcated where construction activity needs to be regulated.

i) Areas demarcated as forest buffers (25metres from the boundary of forests)– In these zones no construction activity should be allowed except construction of irrigation related infrastructure.

ii) Areas demarcated as riparian zones for rivers (10 metres on either side of the river)– In these zones light construction activities relating to washing, bathing and irrigation may be allowed. Also light structures for public use maybe allowed after taking required permissions.

iii) Areas demarcated for riparian zones for streams – (5 metres on either side of the stream)In these zones only construction activity connected to irrigation can be permitted. Structures for public use maybe allowed after taking the requisite permissions. If such zones lie in private property there will be no construction activities which would be allowed within the riparian zone. Also modifications to existing topography by any private owner should not be encouraged and will require permissions from the committee[3] .

iv) Areas around hot springs not located in the river beds or on riparian zones - For such area it is stated that there should be buffer zones of a 3m radius which are public around them. Also they should have public access to them.

A plan showing the zoning control for the !nfluence and Core Zone Plate *10.1* has been attached with the study. These can be used as guidelines to make the development plan for the Core Zone.

[3] Chapter 15 details out the formation of the committee.

10.2. Additions to existing building regulations in the RTDZ

The building regulations that apply within the Core Zone villages have been framed by the MMRDA in its regional plan. It has been observed that building activities related to tourism in these zones have threatened the environmental assets of this region. For this policies need to be framed to control the nature of building activity so that they are not a threat to the biodiversity of this place.

These are:

1. Submission Requirements

For any construction activity in the Critical Focus Area a set of drawings including a contour plan showing existing vegetation and streams should be submitted to the authorities along with the regular drawings of buildings and site. An inventory of trees on site should be prepared. The site plan should not only limit itself to the site boundary but should show site features for a distance of 250 meters from its boundaries.

2. Design Requirements

1. Existing topography should not be changed to tamper with the natural stream and drainage. If any changes are made to the topography necessary by ecological restoration plan should be submitted along with the proposals.

2.Building on streams or their riparian zones should not be permitted.

3. Also existing trees and vegetation on site should be protected. If any mature tree is removed than a compensatory plantation of trees should be carried on in the ratio of 1:5.

4. Landscape design should avoid the use of invasive species and use local native flora as far as possible.

3. Measures to be taken during construction activity –

1. Topsoil removed during building construction should be reused for landscaping purposes.

3. Measures during construction should be taken to see that pollutants from construction activities do not pollute natural storm water systems.

10.3 Traffic Management Plan

The traffic management plan for this precinct has to be made applicable for peak day conditions i.e. during festivals. In the present time during festivals there are problems due to congestion, formation of bottlenecks, lack of parking space, etc as seen in the earlier part of the study. There should be clear strategies laid out for the following.

1. Peak days traffic management

During peak time there are nearly 50,000 people who come into the precinct. There should be constant monitoring of the number of people who come into the villages of the RTDZ during festivals. As in many religious precincts where there are a huge number of tourists, a tax should be levied by the local government. This could also be collected through the year from tourists entering the RTDZ. This would help in providing better services and infrastructure for tourists.

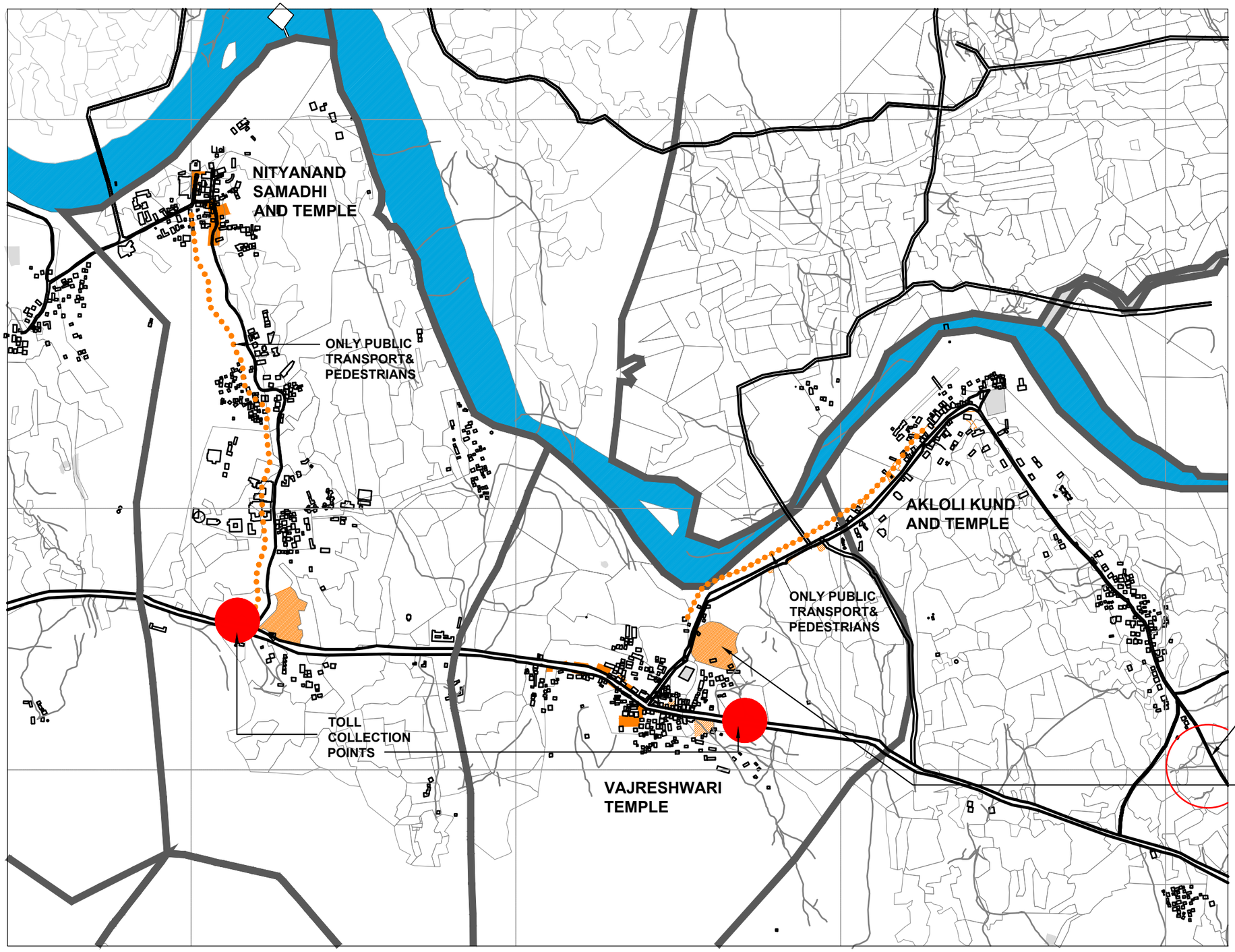
There should be a segregation of different modes of traffic in the villages of the RDTZ in areas which are active during the peak days. The three most active cores during the peak seasons are in Akloli, Ganeshpuri and Vajreshwari. During these peak days especially for the precincts around the hot springs at Akloli and Ganeshpuri pedestrianisation backed up with an effective public transport system would be required. *Plate10.1* shows possible ways of managing tourism related traffic during peak times.

2.Parking plans

During festival days private parking in the Akloli and Ganeshpuri precincts should not be allowed. The parking should be provided near the State Highway so that traffic is restricted in these precincts. For the provision of parking lots government land with pay and parking facilities should be provided for by the local panchayats. In case of Ganeshpuri the religious trusts should be encouraged to provide for such parking spaces near the State Highways in land owned by them. In *Plate 10.2* possible parking locations have been shown.

3.Public Transport augmentation plan

The public transport into the villages has to be strengthened during peak days. This is the only mode that should be allowed to ply on the main approaches into the villages. These could be either State Transport buses which could be used or shared private autos that could ply from the parking lots to the religious cores. *Plate 10.2* shows possible public transport routes and parking areas.



Parking spaces on peak days

The congestion due to private tourist vehicles which is a major problem on peak festival days can be controlled by

1. Providing parking at strategic locations
2. Restricting the entry of private tourist vehicles into the precincts around the temples while augmenting the public transport through shared autoricksha shuttles and state transport buses.
3. Collection of toll for tourists enetring the precincts would assist the Gram Panchayats in creating a fund for augmenting tourist related infrastructure.

LEGEND:

- ROADS
- KACHCHA ROADS
- PEDESTRIANISED WITH PUBLIC TRANSPORT SUCH AS SHARED AUTORICKSHAS & STATE TRANSPORT BUSES
- TOLL COLLECTION POINTS
- PARKING SPACES ON PEAK DAYS

RECOMMENDATIONS:CORE ZONE: PEAK DAYS TRAFFIC MANAGEMENT

0 200 500 1000 M

ENVIROMENT MANAGEMENT PLAN FOR THE GEO-THERMAL ZONE OF THE TANSA RIVER BASIN, 2008, DESIGN CELL- KAMLA RAHEJA VIDYANIDHI INSTITUTE FOR ARCHITECTURE AND ENVIRONMENTAL STUDIES, JUHU SCHEME, VIDYANIDHI MARG, JUHU SCHEME, MUMBAI - 400069, website:www.krvia.ac.in

10.4 Increasing Local Participation in Tourism

One of the attempts of the study is to engage the local population in the tourism economy as this is seen as a very important step in involving the community in the maintenance of their own environment. The overall strategy would be to evolve eco-tourism projects involving the local inhabitants.

The following have been suggested to achieve the above:

1. The participation of the local communities of Akloli, Ganeshpuri and Vajreshwari in the existing recreational and religious tourism economy has to be increased. The Gram Panchayat should be encouraged to give licenses to locals for providing bed and breakfast accommodations. These initiatives can be supported and advertised through the Maharashtra Tourism Development Corporation's official website on the payment of a nominal fee.

2. The second is initiating eco-tourism projects for the tribals in collaboration with the forest department. This has been detailed later in Section 12.2 on rural tourism.

3. The third is through building capacities of local bodies and communities to organize and provide tourism related services. This can be done through the formation of Eco-Development Committees of tribal youth to manage eco-tourism projects and the initiation of these by the JFMC. The capacity building program should be for

i) Enhancing local community awareness of the tourism process.
ii) Capacity building/design inputs related to art & craft skills, cultural & natural heritage.
iii) Capacity building for various aspects of visitor handling.
iv) Environment care and access to cleaner technology with local material, local skills and local traditional styles.

Such projects have been successfully executed by the Thane Forest department through its Eco Tourism Centre as shown in Section 12.2. where the Forest Department in collaboration with the JFMC has initiated eco-tourism projects.

CHAPTER 11 AUGMENTATION OF EXISTING INFRASTRUCTURE

The development plan must include a plan for the augmentation of infrastructure. The study suggests methods in which infrastructure and policies towards it are looked at from the perspective of the protection and sustenance of the environment, and towards a sustainable use of environmental resources for the benefit of local communities. These policies and measures may not be comprehensive in addressing the issues of infrastructure, but rather suggest practices that would help in augmenting basic infrastructure while safeguarding and benefiting the environment. The suggested strategies could inform the making of the development plan by the state authorities.

11.1 Water Supply

The augmentation of water supply for drinking and irrigation are priorities.

Augmentation of domestic water supply

Apart from augmenting the existing water supply system for domestic purposes, which should form an integral part of the development plan, the study suggests the following keeping in focus environmental benefits.

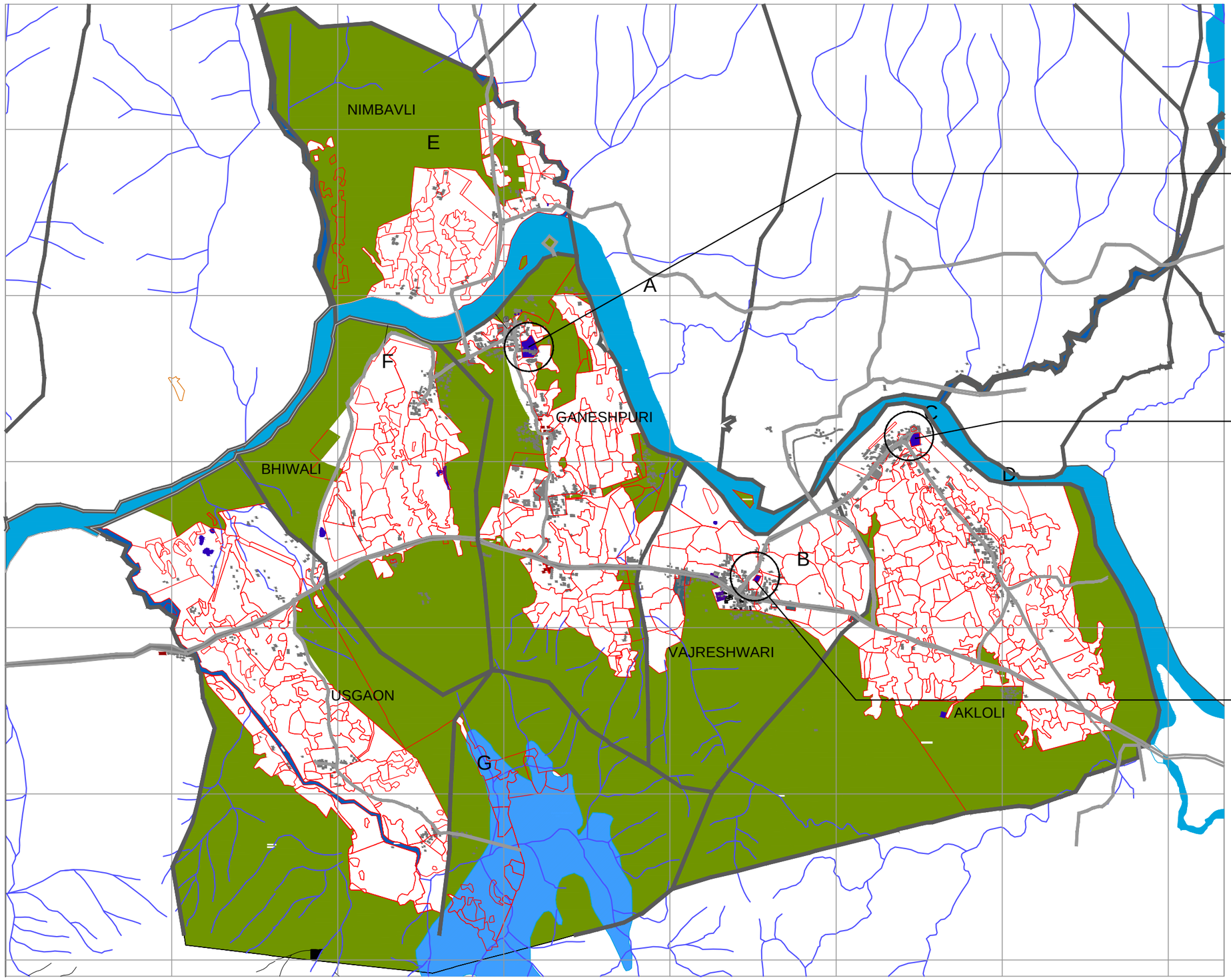
1. Policies towards making rain water harvesting compulsory in all commercial, residential and institutional premises should be instituted. This area has a very heavy rainfall which can be used to recharge the ground water table through the use of bore-wells.

2. Projects to clean and restore existing water resources such as tanks and ponds as shown in Plate 11.1. This will help in water recharge as well as form sources of water for bathing and washing.

3. Ground water management should become a community process whereby the Panchayat sets up a village Ground Water Cooperation Committee (GWCC) which allocates water rights and oversees that individual owners restrict their use of ground water within their rights. Community tube-wells can be set up for use instead of private tube-wells In case of private tubewells/borewells, they should be granted permission only when compensatory rain water harvesting measures have been initiated by the individual.

Water- Projects for Irrigation

4. Within the influence zone, the streams and their watersheds have been identified. In the earlier part of the study issues related to the use and the status of the streams were documented. The study suggests that water restoration projects for these streams should be carried out as a priority. This will go a long way in improving the ecology of the area as well as help in augmenting the agrarian economy. For this a detailed project report has to be prepared for each watersheds, this has to be taken up at the Gram Sabha level
5. The Chote Patbandhare Vibhag (Dept. of small dams) has been executing projects for the building of check dams in this region. The building of check dams within the Influence Zone must be part of a larger comprehensive plan prepared by them as suggested earlier. This should be done in close co-operation with the gram sabha and the gram panchayats of the villages of the influence zone. These dams would augment the agrarian economy transforming monocrop areas into multicrop areas.



Ganeshpuri Talav

Akoli Talav

This talav requires immediate attention, as it is a site of dumping and pollution

Vajreshwari Talav

The existing talavs should be integrated into the storm water system , the water stored in the tanks can be further used to augment the domestic water supply of the villages.
The existing streams in the Core Zone should also be integrated into the storm water system.

LEGEND:

- BUILT FORM
- TEMPLES
- TANSA RIVER
- STREAMS
- WATER BODIES
- VILLAGE TALAVS
- VILLAGE BOUNDARIES
- CTS BOUNDARIES
- FOREST AREA

RECOMMENDATIONS: CORE ZONE: STORM WATER MANAGEMENT, WATER HARVESTING SYSTEMS

0 200 500 1000 M

11.1

11. 2 Solid Waste

In case of solid waste management the choice of systems adopted is critical to the environment. The practice of dumping into the river and burning should be immediately prohibited. The suggestions to adopt a system for management of solid waste should be based on local participation and decentralization.
The study suggests that given the abnormal variations in volumes of solid waste collected on normal and festival days, the Gram Panchayats of all the villages in the RTDZ have to come together to devise a strategy in order to be able to institute a sustainable solid waste management system. The strategy must address both festival days as well as daily garbage.

The system must include the preparation of an integrated plan between the three village panchayats for managing festival day collection and disposal which must adopt the following measures:

1. Bins should be posted at frequent tourist destinations and market places, bus stands and bus stops.
2. Plastic bags for packaging should be minimized and stopped where ever possible. Recycling of plastic should be incorporated into the system of collection. Shopkeepers should be banned from giving plastic carry bags to customers. Paper bags should be promoted made from old newspapers, magazines or recycled paper.
3. Hotels, resorts, restaurants should compulsorily adopt vermi-culture techniques to deal with kitchen waste within their premises.
4. The segregation of organic and inorganic wastes by primary users with household level composting should be initiated by the Gram Panchayat through a training and awareness programme.
5. Setting up of a vermi-composting project by the Gram Panchayat which encourages local employment as well as sale of the compost to local farmers.
6. Recycling project for inorganic wastes. Encouraging and strengthening existing local initiatives for recycling wastes.
7. Designated common sites for disposal storage of recyclable wastes, vermi-culture should be identified, on Gram panchayat lands. These sites shall not be located with the buffer zones of rivers, streams and forests, and preferably on uncultivable wastelands within the panchayats. The spaces for recycling/treatment should be clearly designated by the Panchayat, and the committee as detailed in Chapter 15.

Fig 11.1 Existing local attempts at recycling of plastic waste generated by tourists should be integrated into a collective project managed by local bodies.

11. 3 Sewage

Some of the villages of the RTDZ are very active in implementing sanitation schemes . They have won awards for their coverage of maximum households through decentralized sewerage systems (such as septic tanks) . However as has been seen in the earlier part of the study, some guidelines need to be established with respect to their effect on the environment. .

1. Soak pits and septic tanks should not be built in the buffer zone of rivers, streams as has been observed in some cases in the RTDZ.
2. Direct discharge into streams and rivers should be prohibited, any discharge of sewage out of the premise must be appropriately treated by reed bed or phyto-remediation system before discharge. However, after proper treatment the sewerage water can be discharged into the field for agricultural purpose. An example of an innovative use of treated sewage water for agriculture or landscaping can be seen in the example of Hivre Bazaar as shown in the adjoining Fig 11.2
3. Toilets and sanitation facilities for tourists at the tourist spots are to be constructed.

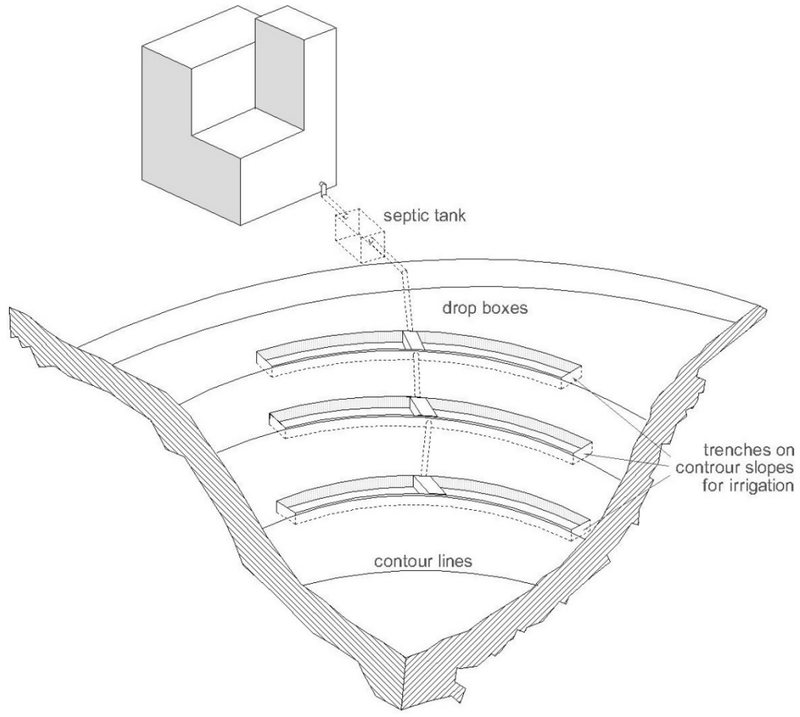


Fig 11.2 Sewerage water can be used for agriculture after treatment through septic tank.
Source: http://www.rainwaterharvesting.org/rural/Hirve.htm

11.4 Storm Water

Presently storm water management is undertaken by the Panchayat and is an ad-hoc system based on local water logging issues. The focus of the system should become the augmentation of local water resources through an integrated rain water harvesting system for the Core Zone.

1. A table survey of the existing topography of the villages and a decentralized system that links to the existing water bodies such as tanks and ponds has to be carried out. As indicated in *Plate 11.1* the existing water bodies in Akloli, Ganeshpuri and Vajreshwari should be used for storm water collection. This water can be later used to augment domestic usage by residents.
2. Rain water harvesting systems should be encouraged at the level of the individual residential / commercial / institutional premises.
3. No further construction within existing tanks/ponds or in the buffer zones of rivers and streams should be allowed.
4. An integrated storm water management plan should be prepared by the Committee (as detailed in Chapter 15) and implemented by the Panchayat.

CHAPTER 12. AUGMENTATION OF LOCAL PARTICIPATION IN THE TOURISM AND AGRARIAN ECONOMY.

12.1 Augmenting the Agrarian Economy.

In this section the agrarian economies relationship with environmental resources is addressed. The strategies that are framed would augment the agrarian economy through methods of environmental conservation.

The main issue which plagues the agrarian economy in this region is the absence of irrigation infrastructure. Therefore it is of primary importance that water for irrigation needs to be made available to the villages. This can be done as mentioned earlier by conserving water through the building of check dams on the streams of this region. The rainfall in this area is very high and such water storage infrastructure could go a long way to provide water for irrigation through the year. It can change this region from a primarily mono-crop area to a multi crop area. It has been observed that where ever there is water available through the year like in some parts of Usgoan the area is multi-crop. This would go a long way in strengthening the local economy and ceasing the sale and transformation of agricultural lands.

As demonstrated in the case of Hivre bazaar the integration of an afforestation scheme and water harvesting projects and soil conservation projects done through a voluntary local body has been able to effect dramatic changes in the agricultural production and water availability for local farmers.

Under Joint Forest Management (JFMS) and Employment Guarantee Scheme (EGS) water and soil conservation works were taken up in the upper reaches, using EGS funds to regenerate the village land and water resources, by creating productive assets like water conservation structures and forests. The district was brought under the Joint Forest Management Programme in 1992. In 1993, the district social forestry department helped the village regenerate the completely degraded 70 ha of village forest and the catchments of the village wells. In 1995, the Adarsh Gaon Yojana was launched. An NGO, the Yashwant Agriculture, Village, and Watershed Development Trust, was created as the implementing agency for development works under the Yojana. Hirve Bazar was selected as the village that could be developed as the model village in the taluka. Under this program, about 52 earthen bunds, two percolation tanks, 33 loose stone bunds were constructed. About nine check dams have also been constructed in a series on the downstream nallah. Crops grown are jawar, bajra, wheat, onion, potato, and vegetables along with floriculture and horticulture. The diary sector has also registered a remarkable improvement.This can be a model which can implemented within the villages of the influence zone of the 6 villages of the RTDZ.

The other aspect which needs to be looked into is the introduction of more profitable alternatives for farmers in the region through agro-forestry . The region being near by the huge markets of Thane and Mumbai could easily benefit from such an shift in agricultural production. Forest products such as medicinal products ,honey, fruit trees, teak, etc. produced through through agro-forestry which are of high economic value would benefit local farmers. These can be practiced in the lands along the fringes of the forests. This fringe area has been demarcated in Plate no. 9.7 for the Influence Zone of the six villages of the RTDZ.

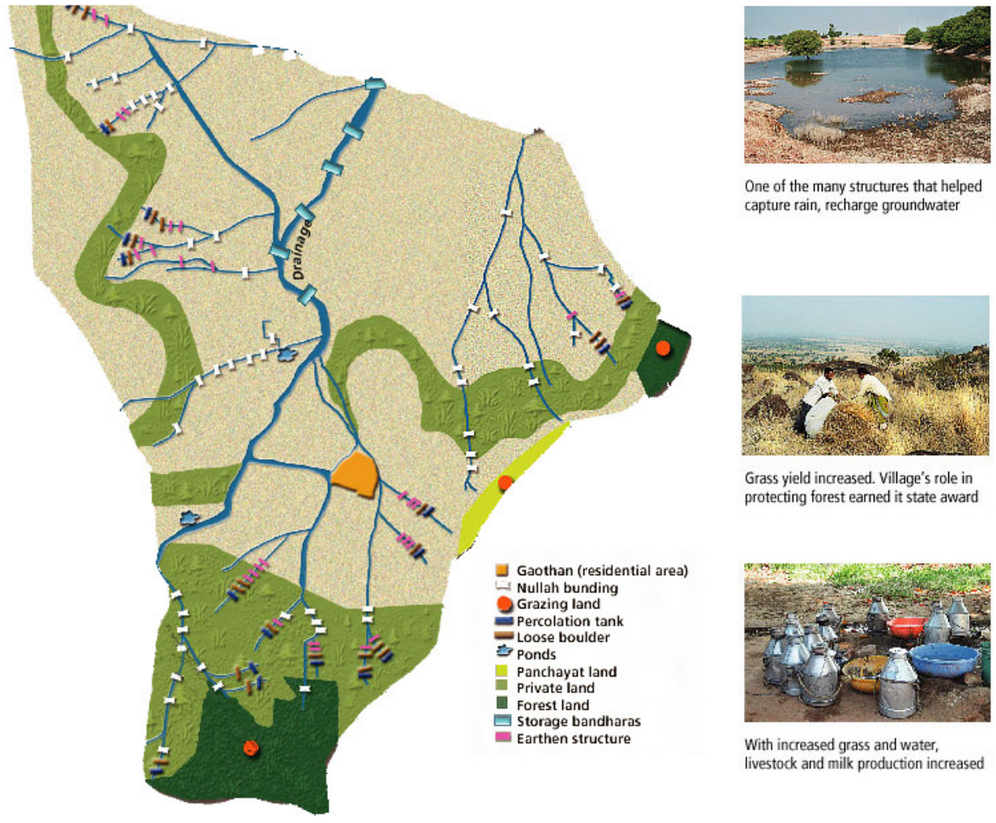


Fig 12.1 Map showing water harvesting projects in Hivre bazaar
Source: www.cse.org

12.2 Augmenting the Tourism Economy for locals

While the study area sees primarily religious tourism, there is an opportunity to augment rural tourism. Rural tourism in this place may entail farm/agricultural tourism, cultural tourism, nature tourism, adventure tourism, and eco-tourism. The Core Zone is set within a landscape of mountains, forest , rivers and thermal springs that offers great opportunities for nature related tourism. There are also places of historic importance in these surrounding mountains and forests such as the Mahuli fort, Shiv Mandir at Tungareshwar, Ghotara Fort etc. as seen in Plate 12.1.

Some popular trails for trekkers already exist in Tungareshwar with its waterfalls and biodiversity being very popular in the monsoons. The trails need to be identified and strengthened through eco-tourism projects that will generate opportunities for locals. The development of a few such trails will provide tangible examples that locals can model their own trails and eco-tours upon. *Plate 12.1* shows the possible trails which can have its base at the RTDZ.

The locals can participate in the organization of these trails. As seen through case studies in other part of Maharashtra such projects have already been successfully initiated in other part of the state.

An example of sensitive eco tourism model is being experimented in Wapha in Shahapur forest division through the participation of the Joint Forest Management Committee where the tribal communities and Forest department manage eco-tourism programmes in a model similar to the Jungle Lodges and Resorts in Karnataka. The scheme aims to empower tribals,protect the forest and bring in revenue. Members of the Joint Forest Management Committee (JFMC) who hail from the nearby Bhagdal village will run the eco-tourism centre and act as guides,cooks and caretakers. The scheme involves the construction of eco-lodges, nurseries for medicinal plants, management of camping sites and providing tents and food and other services.

The Thane Forest Department through its eco-development cell provides the training to locals and can also be the initiator of such projects within the RTDZ.

Fig 12.2 Eco-lodges in the Shahpur fores areas, managed by the local tribal community

Fig 12.3 The Ganeshpuri Reserved forest lands advertised as a picnic spot which can be developed for eco-tourism projects with the collaboration of tribal communities.

There are also examples where NGO's with funding from the Department of Tribal Welfare, provide the finance for training programmes and kits, within the Koyana Wildlife sanctuary, as well as in Bhandardhara where eco-tourism projects have been initiated by mobilizing tribal youth as guides and conductors of tours.
The other examples are the "Development Project in Periyar Tiger Reserve" Here local tribals in collaboration with the forest Department have initiated several projects that are organized by the tribal communities of the area. The communities with local knowledge are ideal guides. They provide services like day treks through the forest, arranging nature camps, horse riding and special programmes for the tourists. The members of all the committees help the Forest Department in undertaking the census of animals in the reserve.
The Trekking programme, conducted by EDC, an Eco-development Committee (involving Tribal trekkers cum Guides), formed by 20 selected youths from the nearby tribal hamlets, offers a possibility to know the richness of an ideal tropical evergreen forest within a short span of time.
The Central government has made plans to augment rural tourism through the country and has set aside funds for this purpose. For availing these funds, there are certain aspects which are of immediate importance for initiating this activity in the villages of the RTDZ.[4]:

i) Formation of a Committee for Implementation

The implementation would be done through a Committee (as detailed in Chapter 15)headed by the District Collector. Activities like improving the environment, hygiene, infrastructure etc. would be eligible for assistance. Apart from providing financial assistance the focus would be to tap the resources available under different schemes of Dept. of Rural Development, State Govts. and other concerned Departments of the Govt. of India.

ii). Identification of villages:

Nomination of the villages would have to be done. Each State/UT Govt. can to furnish one proposal for promotion of Rural tourism. In this case the RTDZ villages can be proposed as target villages for rural tourism.

iii) Preparation of detailed plan for implementation of the project:

A detailed plan for the rural tourism projects would have to be prepared by the committee. It should be ensured that at least 50% of the project should be implemented through achieving convergence of different schemes. Assistance up to Rs.3 lakhs would be provided to the State Govt. for engaging an expert for preparing the project report.

iv). Assistance under the Scheme: A maximum of Rs.50 lakhs would be sanctioned under this scheme. The activities listed under the para-5 could be taken up

v) Permission activities: The following works may be taken up under the Scheme –

a) Improvement of the surroundings of the village. These would include activities like landscaping, development of parks, fencing, compound wall etc.
b) Improvements to roads within the Panchayat limits. This shall not include any major road which connects the village.
c) Illumination in the village.
d Providing for improvement in solid waste management and sewerage management.
e) Construction of Wayside Amenities.
vi) Procurement of equipment directly related to tourism, like Water Sports, Adventure Sports, Eco-friendly modes of transport for moving within the tourism zone.
f) Refurbishment of the Monuments.
g) Signages
h) Reception
i) Other work/activities directly related to tourism
j) Tourist Accommodation

vi) Focal Point for Implementation of the projects: State Tourism Development Corporations are entrusted with the responsibility being the Focal Point of formulating and implementing Rural Tourism Projects. These will be created in consultation with District Collectors/Deputy Commissioners to ensure convergence from other yojanas, schemes and allocations for broader/integrated development at the site to benefit local communities.

[4] This is with reference to the guidelines laid down by the Central Government for the sanctioning Rural Tourism projects.

TO SURAT

TO NASIK

TO BANDRA TERMINUS

TO KALYAN JUNCTION

NH8

SH35

SH40

NH3

609
Takmak Fort Mountain

300

540
Murumba and
Ghori Dongar

400
Dauze Hill

500
Mandagni Peak

Belchatep
and Devdongri

380
Choura Dongar

2 Day 20 kilometer Trek

10 kilometer Day Trek

221
Malleshwari

276
Jivdhani

201

303

662
Tungar Hill

585
Ghotara Peak

Usgaon Hills

524
Devidongar

954
849
Mahuli Fort Mountain

194
Saluti

652
Kamandurg

Dyari Hills

SOURCE: *Heritage of Tansa Valley*,
A.K. Sharma,Bharatiya Kala Prakashan, 2004


MAHULI FORT


CAVES


VAJRESHWARI TEMPLE


GANESHPURI HOT WATER SPRINGS


MAHADEO TEMPLE

MAHULI FORT ENTRANCE

The map above indicates sites and relics of historic importance as well as hills and peaks in the region that can be developed as eco trails.

LEGEND:

- TANSA RIVER
- RAILWAY LINE
- NH4 NATIONAL HIGHWAY
- SH35 STATE HIGHWAY

1. Reconstructed Siva temple at Parol with sculptures dating back to 10th-11th century AD.

2. Buddhist Stupa at Tilher

3. Tungareshwar temple with an image of Parvati dating from the 11th12th century AD, along with tribal shrines and sculptures.

4. Ancient tanks- Ancient tanks with perennial supply 300x100m, with images of Siva were found at Saivan which was a resting place and habitation for traders.

5.Gaja-Lakshmi - Gadhaiya Lakshmi sculptur, east of village Medha.

6. A memorial pillar- A memorial pillar of basalt at Kalambhon of a filled up ancient tank, on a mound.

7.Buddhist Stupa- At Nimbavli,

8. Bhimeswar Mahadeo Temple -Ganeshpuri

9. Vajreshwari temple- A temple in the name of goddess Vajreshwari built during the Peshwa period is situated at vajreshwari

10. Maheswar Mahadeo temple, dating back to peshwa period, and also hot water springs are seen in Akloli

11.A ruined temple - A ruined temple of Silahara period is found at Pahare

12. Ghotgaon- Ruins of a Siva temple, Jain images from approximately 8th to 9th century AD on the banks of the Shantanu River

13. Cave remains- Cave remains at Ambivali dated between BC 100 and 600.

14. Bhargavram temple at Gunj overlooks a tank. Every year a fair is held around may in honor of the deity, Siva temple, Gaondevi temple.

15. Takmak fort- Constructed in the 14-15th centuries and were active until the 18th century

16. Mahuli- The mahuli fort peak

17. Ghotara fort-Old Maratha fort at an elevation of 584 metres.

RECOMMENDATIONS: INFLUENCE ZONE: DEVELOPMENT OF ECO-TOURISM IN THE REGION

00 01 02 04 08 KM

ENVIROMENT MANAGEMENT PLAN FOR THE GEO-THERMAL ZONE OF THE TANSA RIVER BASIN, 2008, DESIGN CELL-KAMLA RAHEJA VIDYANIDHI INSTITUTE FOR ARCHITECTURE AND ENVIRONMENTAL STUDIES, JUHU SCHEME, VIDYANIDHI MARG, JUHU SCHEME, MUMBAI - 400069, website:www.krvia.ac.in

CHAPTER 13. SUMMARY OF PROPOSED REGULATIONS

13.1 Regulations regarding construction and any other activities within the designated zones

This chapter summarizes the spatial environmental and development related regulations identified in the earlier part of the study. These would help in forming environmental guidelines while preparing the development plan for the RTDZ. These should be seen as additional controls to the proposals within the development plan.

REGULATIONS REGARDING THERMAL SPRINGS				
DESIGNATED ZONES	DESCRIPTION OF REGULATION	AREAS WHERE THE REGULATIONS ARE APPLICABLE	REGULATIONS REGARDING BUILDING CONSTRUCTION	REGULATIONS REGARDING ACTIVITIES
Areas around thermal springs within the river bed under State ownership.	While public access to the springs lying within the river is permitted, activities such as washing and bathing should not be permitted at these springs.	The Core Zone	1. No permanent construction which alters the natural conditions of the river beds should be allowed. However religious and recreational activities which are temporary in nature could be allowed within this zone. 2. Enclosures around hot-springs should be constructed with materials that allow for the percolation of water *(Fig. 8.2)* Concrete as a material of construction should be avoided. Instead locally available material such as stone with open joints which allow for percolation of water should be encouraged. Some e.g. of possible construction solutions have been shown for hot-springs located in Akloli and Ganeshpuri. 3. Any improvement measures and construction of facilities will require prior approval from the committee.	1. Existing activities such as public common washing, bathing, in and around hot springs that lie along and within the river beds needs to be prohibited while alternative bath houses that use the hot water from the spring should be provided at a distance away from the river bed. (Plate 9.5)
Areas around thermal springs within private properties	An area of 3 metres radius around the spring should be kept public. Public access should be provided to the springs.	The Core Zone	No building construction within these zones shall be permitted except for stone enclosures as indicated in *Fig. 8.2* to define the hot springs. The development rights of the land within the buffer areas will be transferred to the remainder of the land. Any improvement measures and construction of facilities will require prior approval from the committee.	Existing activities such as washing, bathing, in and around hot springs needs to be prohibited while alternative baths or health spas that use the hot water from the spring could be provided at a distance away from the thermal spring.
Areas around thermal springs within temple precincts or religious trusts.	3 metres radius around the spring should be kept public. Public access should be provided to the springs.	The Core Zone	No building construction within these zones shall be permitted except for stone enclosures as indicated in *Fig. 8.2* to define the hot springs. Some of the existing hot springs that lie within temple precincts, at Ganeshpuri and Akloli, the status quo should be maintained. Any improvement measures and construction of facilities will require prior approval from the committee.	The status quo in terms of existing activities i.e. being allowed to take a dip in the kund should remain . Bathing and washing with any form of soap has already been prohibited and should continue to remain so.
REGULATIONS REGARDING RIVER AND STREAM EDGES				
DESIGNATED ZONES	DESCRIPTION OF	AREAS WHERE THE	REGULATIONS REGARDING BUILDING CONSTRUCTION	REGULATIONS REGARDING ACTIVITIES

	THE REGULATION	REGULATIONS ARE APPLICABLE		
River and Stream Edges adjoining settlements	10 metres from the river edge on either side is designated as the riparian zone. 5 metres from the stream edge on either side is designated as the stream riparian	Influence Zone and The Core Zone	1. The un-built areas within riparian zones along existing settlements have to be mapped with the help of the Gram Panchayat and reserved as unbuildable zones. There should be no further building activity permitted within this designated riparian zone. In private landholdings within the riparian zone of the river, the construction of permanent structures for habitation in the buffer (10 metres from the river edge) areas should not be permitted. The development rights over these lands will be transferred to the remainder of the plot. No building activity which obstructs the natural drainage of water should be allowed in these zones. 2. Religious and recreational activities which are temporary and may include the construction of light temporary structures could be allowed within this zone. The construction of these structures can only be undertaken after prior permission of the concerned Gram Panchayat and the Committee. (as detailed in chapter 15) 3. Construction of washing structures and ghats that do not include habitable structures may be permitted in this zone. 4. Construction of check dams and other irrigation related infrastructure may be permitted in this zone.	1. There should not be any dumping of raw sewage into the streams and rivers. If there is any such existing plots/owner/ dumping raw sewage or water generated from washing, bathing, toilets, they should use alternative waste water treatment technologies such as phyto-remediation, before releasing it into the river. 2. Any washing activity along these portions of the river should be allowed only within the riparian zone of the river. Structures for washing as shown earlier should be light in nature and should not let waste water discharge into the water without treatment. 3. The riparian zones along settlement edges should not be used for sand dredging as these edges being settlement edges can be used as public spaces.
River and Stream Edge Policy adjoining agrarian land.	10 metres from the river edge on either side is designated as the riparian zone. 5 metres from the stream edge on either side is designated as the stream riparian zone.	Influence Zone and The Core Zone	1. No permanent construction which alters the natural conditions of the river beds should be allowed. 2. Construction of washing structures and ghats that do not include habitable structures may be permitted in this zone. 3. Construction of check dams and other irrigation related infrastructure may be permitted in this zone.	1. These are the only edges where sand dredging can be permitted in a controlled manner. This activity should be controlled by allowing a fixed number of licenses every year. Also dredging during monsoon months should be discouraged to allow the riverbed to be replenished. 2. Any washing activity along these portions of the river should be allowed only within the riparian zone of the river. Structures for washing as shown earlier should be light in nature and would not let the waste water discharge into the water without proper treatment.
River and Stream Edge Policy adjoining forests.	10 metres from the river edge on either side is designated as the riparian zone. 5 metres from the stream edge on either side is designated as the stream riparian	Influence Zone and The Core Zone	1. No construction should be allowed in these zones. 2. Construction of check dams may be permitted in this zone with prior permission from the Forest Department.	1. These are the only edges where sand dredging can be permitted in a controlled manner. This activity should be controlled by allowing a fixed number of licenses every year. Also dredging during monsoon months should be discouraged to allow the riverbed to be replenished. 2. Washing and bathing, should be prohibited within these zones.

	zone.			
REGULATIONS REGARDING FOREST FRINGES				
DESIGNATED ZONES	DESCRIPTION	AREAS WHERE THE REGULATIONS ARE APPLICABLE	REGULATIONS REGARDING BUILDING CONSTRUCTION	REGULATIONS REGARDING ACTIVITIES
Forest buffer zones + sensitive zones around settlements	25 metres from the forest boundary	Influence Zone and The Core Zone	1. No building construction activity should be allowed in a buffer of 25m from the forest boundary. In case of private properties which are located within such zones building construction activity should start form 25m away from this zone. The development rights of land lying within the buffer zone will be transferred to the rest of the plot.	Through the JFMC this zone should be established as a special zone for implementation of afforestation and conservation projects or agro-forestry projects.
ADDITIONAL DEVELOPMENT CONTROL REGULATIONS FOR BUILDINGS				
DESIGNATED ZONES				AREAS WHERE THE REGULATIONS ARE APPLICABLE
For any construction activity in the Critical Focus Area a set of drawings including a contour plan showing existing vegetation and streams should be submitted to the authorities along with the regular drawings of buildings and site. An inventory of trees on site should be prepared. The site plan should not only limit itself to the site boundary but should show site features for a distance of 250 meters from its boundaries.				The Core Zone
Existing topography should not be changed to tamper with the natural stream and drainage. If any changes are made to the topography necessary ecological restoration plan should be submitted along with the proposals.				The Core Zone
Building on streams or their riparian zones should not be permitted.				
REGULATIONS REGARDING WATER				
DESCRIPTION				AREAS WHERE THE REGULATIONS ARE APPLICABLE
Water harvesting measures should be made compulsory for all commercial and residential structures.				The Core Zone
No further construction within existing tanks/ponds or in the buffer zones of rivers and streams should be allowed.				
REGULATIONS REGARDING SOLID WASTE DISPOSAL				
DESCRIPTION				AREAS WHERE THE REGULATIONS ARE APPLICABLE
All commercial establishments such as resorts, restaurants and hotels should compulsorily set up vermi-composting projects for the management of their kitchen wastes.				The Core Zone
Designated common sites for disposal, storage of recyclable waste, vermi-culture should not be located within the buffer zones of rivers, streams and forests, and should be located on uncultivable wastelands within the panchayats.				
REGULATIONS REGARDING SEWAGE DISPOSAL				
DESCRIPTION				AREAS WHERE THE REGULATIONS ARE APPLICABLE
Soak pits and septic tanks should not be built in the buffer zone of rivers, streams as has been observed in some cases in the RTDZ.				The Core Zone
Direct discharge into streams and rivers should be prohibited. Any discharge of sewage out of the premise must be appropriately treated by reed bed or phyto-remediation system before discharge.				

CHAPTER 14. PRIORITIZATION OF ACTIVITIES

This Chapter summarises and prioritises projects and activities as recommended in the earlier chapters. All these projects have been prioritized as low, medium and high priority projects based on their capacity to make an immediate impact on the environment and their benefit to the local community. Possible sources of funding for these have also been listed. Most projects would have to undergo inspection and approval by the committee as proposed in Chapter 15.

Area Of Concern	Identified Projects	Implementing Agency	Possible Funding Source	Priority
Protection of geo thermal resources	Re-organising tourism infrastructure around Akloli hot water springs. This would include the construction of bath houses away from the existing springs and redefining the existing enclosures.	Collectorate + Gram Panchayat	MMRDA+ MTDC after submission of a detailed project report.	HIGH As this would have immediate effect on putting an end to the encroachment and misuse of the river bed.
Water-shed management and restoration plans	Building of check dams, restoration of ponds, percolation tanks for recharge.	Gram Sabha+ Joint Forest Management Committee + Chote Patbandhare Vibhag + Forest Department.	Sampoorna Gramin Rojgar Yojana+ Pradhan Mantri Adarsh Gram Yojana (for villages with scst populations above 50%)	HIGH As this would immediately augment the agrarian economy as well as improve the region's ecology.
Augmentation of forest protection especially in fringe areas	Afforestation projects, Agroforestry projects in plots under the management of the JFMC.	Joint Forest Management Committee+ village Forest committee+ Forest Department.	Joint Forest Management Scheme of the Forest Department.	MEDIUM As this is a continuous project.
Protection of critical slopes	Afforestation of critical slopes.	Forest Department+ Joint Forest Management Committee	Joint Forest Management Scheme of the Forest Department	MEDIUM As this is a continuous project.
Traffic Management Plan	Festival days traffic management plan.	Gram Panchayat + Police Department +MSRDC	MSRDC +MTDC+ Gram Panchyat through collection of a tourism tax.	HIGH This can be easily immediately implemented.
Water	Rural Water Harvesting Schemes for the Core Zone.	Department of Water supply	Jalswaraj Yojna, MMRDA	LOW As this would be a long term project.
Solid Waste	1. Segregation of waste 2. Vermi-composting project 3. Recycling Project	Collectorate + Gram Panchayats	Swacchata Abhiyan, +Sampoorna Grameen Rozgar Yojna	HIGH
Sewage	Implementation of septic tank at household level	Gram Panchayat	Private individual owners.	HIGH
Storm Water	Strengthening of existing storm water system and its alignments with natural water system	Gram Panchyat	Gram Panchyat Funds	LOW
Augmentation of the tourism economy	Eco-Tourism projects	Joint Forest management Committee, Eco-development Committee composed of tribal youth.		HIGH
	Rural tourism projects such as bed and breakfast schemes,	Committee formed Gram Panchayat, Trusts	Scheme of Rural Tourism under the MTDC and the Ministry of Tourism	HIGH

CHAPTER 15. CREATING AN INSTITUTIONAL FRAMEWORK.

In the earlier stage the existing institutional actors and agencies, their involvement with the administration and management of resources of the Core Zone, their strengths and weaknesses were analyzed. It clearly indicated that local actors and agencies who are immediately engaged with and dependent upon the resources of the villages of the Core Zone have no participation in managing the environment or the tourism activity within it. In this chapter the study would formulate an institutional structure that could help in encouraging participation in the decision making process of safeguarding the environment and managing tourism. The following suggestions are recommended to achieve this:

1. Formation of a RTDZ Coordination Committee composed of the sarpanches of the 6 villages, 2 tehsiladars associated with these villages and 4 experts appointed by the Environment Committee of the MMRDA. Out of the four experts appointed by the committee 2 members should have an environmental background while, the rest should have worked in the area of rural development. The District Collectorate of Thane should be the nodal institution to head this committee. The team should comprise of the Collector and three appointed members from his team, who can be chosen as depending on the nature of the projects which are being implemented. The mandate of this committee would be to:

a) Monitor the preparation of the development plan, tourism development plan, traffic management plan etc of the region in a manner conducive to the environmental diversity of the region. For this they should involve all local stakeholders. They should also monitor the preparation of the detailed project reports.

b) Approve plans for all building projects in the RTDZ except for privately owned residences. In these cases all building permissions plans and submission drawings which have been identified in the earlier part of the study should have this committee's approval.

c) Help in implementing and later monitor projects which have been identified in this study. They could also suggest projects that would help in protecting and improving the environment.

d) Study the budgetary allocations of the villages and assist in judicious resources planning of the RTDZ. The committee should also assist in identifying existing state, central and local government funding sources

2. Wherever the Joint Forest Management Committee of a village exists, it should be involved in the development of eco-tourism through local participation. This should be apart from their existing function of helping in cultivation in forest land and buffer zones of forests.
Plate 14.1 represents the institutional structure diagrammatically.

FORMATION OF COORDINATION COMMITTEE

LOCAL LEVEL

VILLAGE PANCHAYAT

(VILLAGE / GRAM PANCHAYAT)

-Power to levy, collect and appropriate suitable local taxes
-Implements the development schemes of the village

- AKLOLI
- VAGRESHWARI
- BHIWALI
- USGAON
- GANESHPURI
- NIMBAVLI

3 MEMBERS
Inclludes all the Sarpanch of all the gram panchyat in this case

PANCHAYAT SAMITI (TALUKA / TEHSHIL)

-Works for the villages of the Tehsil or Taluka
-It's the link between the Gram Panchayat and the district administration

- BHIVANDI TALUKA
- WADA TALUKA
-

3 MEMBERS
All the tehsiladar of the taluka should be represented.

THANE DISTRICT COLLECTORATE

- DEPARTMENTS OF AGRICULTURE
- DEPARTMENTS OF INDUSTRIES
- DIASATER MITIGATION
- IRRIGATION DEPARTMENT
- LAND RECORDS
- RURAL DEVELOPMENT DEPARTMENT
- PUBLIC WELFARE
- TRIBAL WELFARE DEPARTMENT

1 + 3 MEMBERS
From the Collector's office there should be the colletor who would convene all the meetings and three represenatives whom he can choose from his diffrent pepartments depending on the type of projects that need to be implemented

STATE LEVEL

MAHARASHTRA STATE FOREST DEPARTMENT (MSFD)

looks after the forest areas and governs the resources of the forest

1 MEMBERS
The Forester of the Mandavi and Tungar Range should be a part of the Committee.

MUMBAI METROPOLITAN REGIONAL AUTHORITY (MMRDA)

- its part of the planning area
- it can make policies for the whole region, some of which can impact the area

3 MEMBERS
There should be expert who have an environmental concern as well as expert who have done work on rural developement.

THE CORE MEMBERS OF THE COORDINATION COMMITTEE

SARPANCH OF PANCHAYAT BELONGING TO THE INFLUENCE ZONE OF THE RTDZ.
They should be called as and when required for issues concerning environemntal aspects.

JOINT FOREST MANAGEMENT COMMITTEE
Though their members are a part of the committee, they can be independently called to discuss the initiatives that they are implementing in the RTDZ and its influence zone.

MUMBAI POLLUTION CONTROL BOARD
The coodination committee should work in close interaction with the MPCB on issues of pollution in the Tansa River

MAHARASHTRA STATE TRANSPORT CORPORATION
The coodination committee should work in close interaction with the MSRTC on issues of traffic management in the RTDZ

FARMER'S COOPERATIVE SOCIETY
The Coordination Committee should work in closely with the farmers society to implement schemes on rural developement.

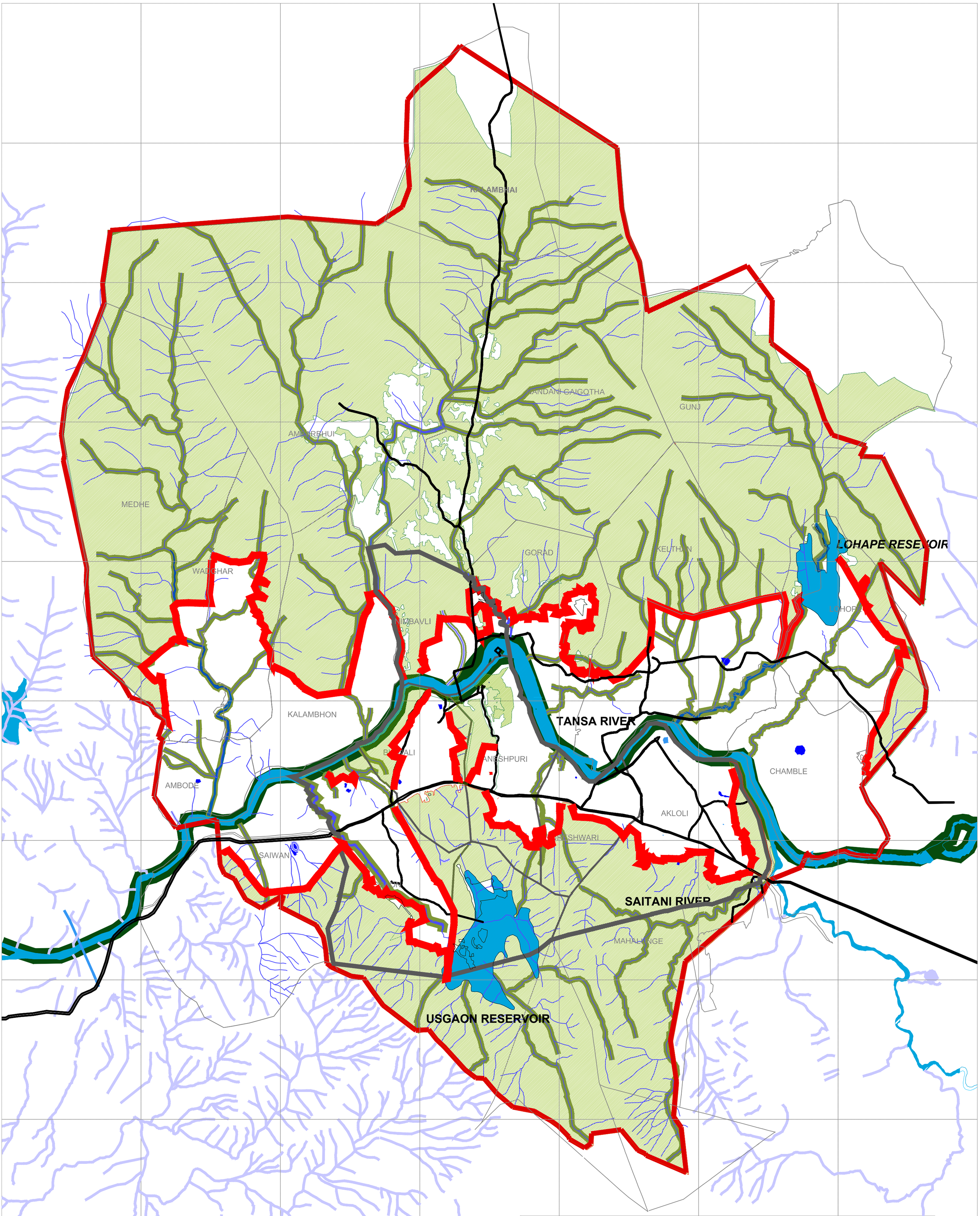
SHOP-KEEPER ASSOCIATION
For the implementation of any tourism developmnet and mamagement plan the committee has to work in collaboration.

VILLAGE RESIDENTS ASSOCIATIONS
The committee should encourage the vllagers to form village residents association who can then be encouraged to play an active role in the developement of the place.

RELIGIOUS TRUSTS IN THE RTDZ
For any successful Torism management Plan to be prepared and implemented the Coordination Commmitte should work in close interaction with these local stakeholders

LOCAL NGO's WORKING WITH DEVELOPEMNTAL ISSUES IN THE REGION
There are many Ngo's working on developmental issues, tribal development in the region with whom the coordination committee should work closely.

LOCAL STAKE HOLDERS



SOURCE: SURVERY OF INDIA MAPS, 1972. CTS Maps

This is a comprehensive plan which indicates the buffer zones for forests, rivers and streams. These buffer zones need to be integrated into the development plan when it is prepared.

LEGEND:

- RIPARIAN BUFFER ZONES ZONES ALONG MAJOR RIVERS (10M ON EITHER BANK)
- RIPARIAN BUFFER ZONES ALONG STREAMS (5M ON EITHER BANK)
- 25 METRE WIDE BUFFER FROM FOREST BOUNDARIES
- LAND UNDER FOREST OWNERSHIP
- INFLUENCE AREA
- STREAMS WITHIN CFA
- TANSA RIVER
- STREAMS OUTSIDE CFA

RECOMMENDATIONS:INFLUENCE ZONE : BUFFER ZONES FOR ENVIRONMENTALLY SENSITIVE AREAS

00 01 02 04 KM

10.1

ENVIROMENT MANAGEMENT PLAN FOR THE GEO-THERMAL ZONE OF THE TANSA RIVER BASIN, 2008, DESIGN CELL- KAMLA RAHEJA VIDYANIDHI INSTITUTE FOR ARCHITECTURE AND ENVIRONMENTAL STUDIES, JUHU SCHEME, VIDYANIDHI MARG, JUHU SCHEME, MUMBAI - 400069, website:www.krvia.ac.in