

Formulating eco-sensitive planning guidelines for forested and hilly areas in Pune metropolitan region: The Case of proposed ring road in Pune, Maharashtra

Ar. Nikita V. Thorat & Ar. Susmita H. Pansare

Faculty of Architecture and Planning, Parul University, Vadodara

Abstract – Management of Eco-sensitive areas is important for the long-term maintenance of soil, water biological diversity, or other natural resources both on the site and in a regional context. MoEFCC notifies eco sensitive zones, under Environment Protection Act 1986. The Maharashtra State Road Development Corporation (MSRDC) has planned circular outer road within Pune metropolitan region. The alignment of the road passes through hilly and forested area, which will affect the forest ecology, settlement and land use patterns.

This paper presents the study of the changing forest ecology and analyses the impacts on the study area. To mitigate environmental risks, guidelines supporting eco sensitive zone are needed for future development projects. Need of the study will be to mitigate environmental risk and develop innovative development strategies. Study will only be limited to prepare guidelines for the forested area within PMR.

The Pune metropolitan region has development control regulation for planned forested and hilly areas within PMR, There is need to revise guidelines, as suggested after the study of the ring road with affected the forest ecology. Preparing planning guidelines for mitigating the affect on ecology and eco sensitivity of the forested and hilly areas will be discussed in paper.

Key Words: planning guidelines, eco sensitive, forest ecology, forested and hilly areas, and proposed ring road.

1. INTRODUCTION



Fig.1 Ring road map

Background

The Source: PMRDA Official website traffic around Pune city has been increasing at high rate due to industrial and other socio-economic development. Pune Ring road is a proposed circular outer road for Pune metropolitan region. The project road shall be a 6-lane highway to be developed with expressway standard with provision of future 8-lane. It passes through 41 villages under 5 Talukas, viz. Bhor, Maval, Paud, Haveli & Mulashi.

The proposed Pune Ring Road is entirely a green field alignment. The alignment of the road passes through hilly and forested area, which will affect the forest ecology, settlement and land use patterns. Agriculture fields- 8%, vegetation- 15%, Water Bodies- 7%, Hills- 22%, Barren land- 16%.

To mitigate environmental risks, guidelines supporting eco sensitive zone are needed for future development projects.

2. NEED OF STUDY:

The proposed project also has infrastructure development which will affect the eco sensitive zones and forest in the western aligned area. It will cause soil, land, and noise and air pollution. Also the expected infrastructure development can affect the species, and natural environment. There is a need to have some guidelines with the line of eco sensitive aspects. The Pune metropolitan region has development control regulation for planned forested and hilly areas within PMR, There is need to revise guidelines, as suggested after the study of the ring road with affected the forest ecology.

3. AIM

To formulate eco- sensitive planning guidelines for forested and hilly areas in Pune metropolitan Region

4. OBJECTIVES

- To Study the **existing plans and guidelines for the proposed ring road.**
- To analyze the **effect of ring road on the study area.**
- To understand the **factors on which Development control regulations are framed.**
- To study **similar cases of Development control regulations and strategies.**

5. STUDY AREA

Paud and Haveli have most of industrial development, and less number of forests and agriculture land acquisition where Mulshi, Maval and Bhor taluka towards the west side of the

proposed ring road, have eco-sensitive zones and Western Ghats.

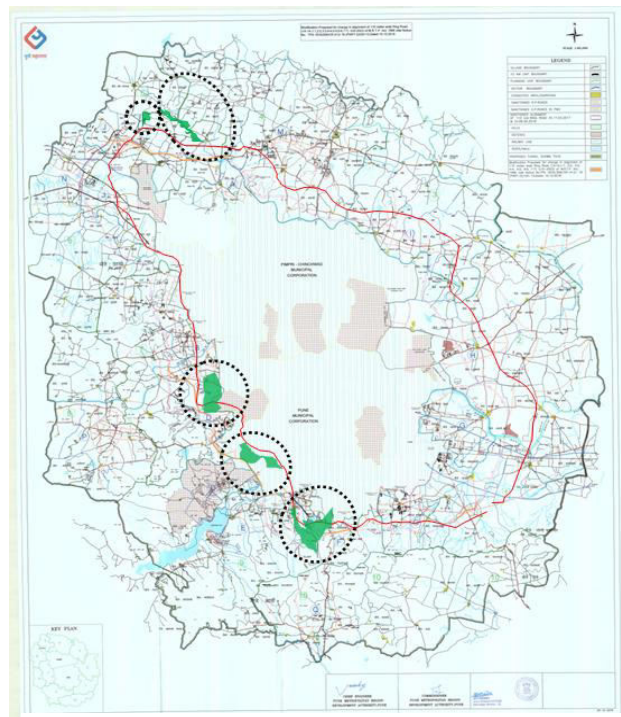


Fig.2 Ring Road Map showing forest

Source: PMRDA Official website

Forest No	From	To	Length km	Forest range
1	0+700	1+300	0.60	Forest
2	12+600	13+600	1.00	Bhandara Parisar forest range
3	94+400	96+000	1.60	Forest
4	99+000	103+500	4.50	Forest
5	113+600	114+100	0.50	Forest

The proposal will be focusing on the western alignment of the ring road. Study is limited to forest no- 3

a) Dry Mixed Forests:

Teak is present occasionally and the evergreen component of species is larger than in case of Teak bearing forests.

The main species are Pterocarpus marsupium (Bija), Salmalia malabaricum (Semal), Terminalaia bellarica

(Behada), Dalbergia latifolia (Shishum), Syzgium cumini (Jambul), Terminalia tomentosa (Ain), Lagerstremia parviflora (Bendara) etc.



Fig.3,4 Forest no-3

Source: MAHA forest official website

b) Flora and fauna

Aquatic insects- The dominant group of aquatic insects were those that prefer polluted water, marshy area and water-body with vegetation cover respectively. The presence of chironomy larvae in most of the localities indicates that the rivers and water-bodies are polluted.

Ants- Pheidole and Cryptopone recorded only from hill forests and thus more vulnerable. Myrmicaria, Leptogenys ants are also seen.

Butterfly- Forest dwellers like the Bush brown, few species of Yellows and Flats.

Some species occur throughout the year with a short population peak in a specific season, and some species occur only for a few months.

Eco-Sensitive Zones are areas within 10 kms around Wildlife Sanctuaries, National Parks and Protected Areas. So we further study the areas and villages within 10kms of study area, forest no-3.

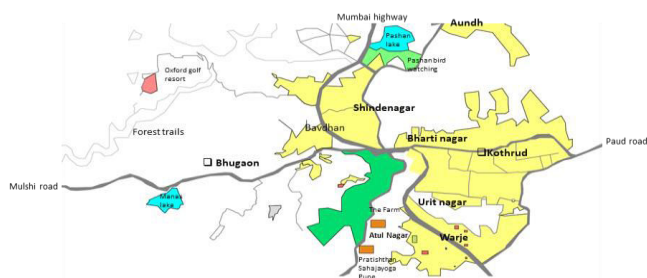


Fig.5 Zones within 10kms

c) Surrounding villages –

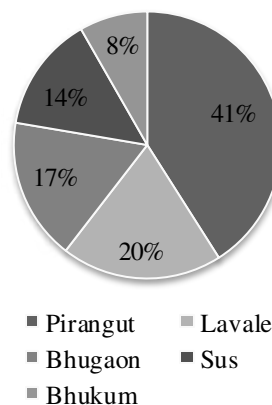
Bhugaon(5949), Lavale(6732), Bhukum(2859), Sus(4862) and pirangut(6173)

d) Occupation of people-

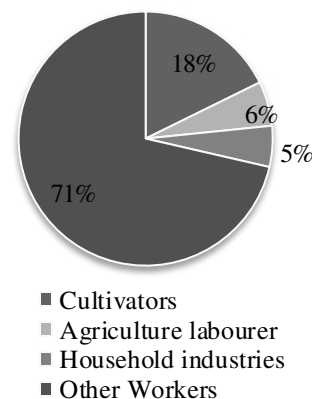
Major population is involved in agriculture activities, cultivators, agriculture labours and few involved in business.

In and Mulshi taluka agriculture is the main occupation and the number of cultivators is more than agricultural labors.

Population



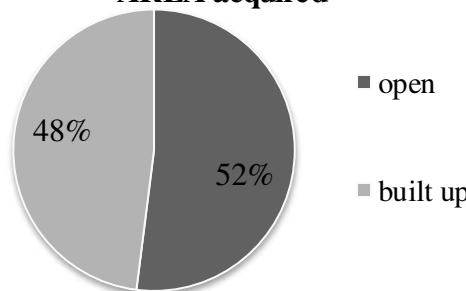
Work profile



e) Crops Grown- Jowar is the main crop. More area under Paddy is in the talukas of Khed, Maval, Velhe, Bhor.

The other main crops and the area under them were Bajari (9%), Wheat (5%), and Pulses (8%).

AREA acquired



f) Observations-

- Area acquired for the road alignment has 48% of built and 52% of open spaces.

- There is more development to the east side of the forest which is pune municipal cooperation. Most of the area is residential and mixed use.
- Whereas towards the west side of the forest the percentage of barren land and agricultural is more. There are schools, shops, hospitals, lakes and resorts in the area.
- Main occupation of the people in the villages is agriculture. Comparatively cultivators are more than the agriculture labors.

6. AREA WITHIN 10KMS- Forest No 3

Pashan lake, Manas Lake , Farm by Protecterra are the recreational spots within 10kms area of forest no 3.

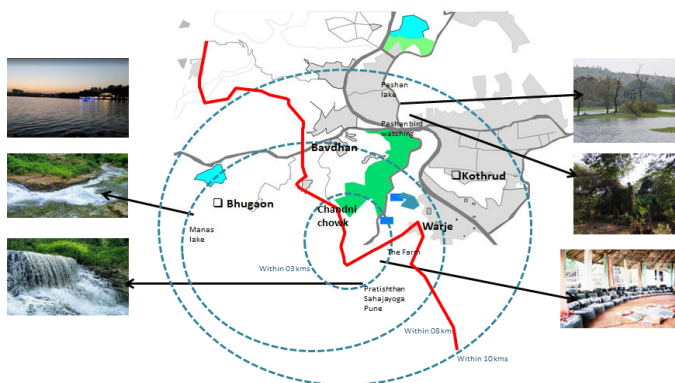


Fig.6 area within10kms (Recreational areas)

a) PRESENT CONDITION-

Manas lake- (existing condition)

- Manas Lake (Bhugaon) is a source of irrigation for agriculture land near the lake and to provide drinking water for villages near that as Bhugaon village, Green villa, Sarovar, Matalwad, Agrewadi and Bavdhan area in Pune city.
- But there are many restaurant, hotels and agricultural land that direct or indirect discharge their sewage into the lake.
- Indiscriminate use of chemical fertilizers and pesticides in agriculture are causing heavy and varied pollution in aquatic environment leading to

deterioration of water quality and depletion of aquatic biota.

- Lack of cleanliness and need of basic infrastructure is observed.
- Heavy traffic is observed during peak hours.



Fig.7, 8,9 Present condition of Manas Lake

- Patterns of bird diversity with regards to the resident, the resident with local migratory and winter migratory species.
- It was found that a total of 28 species belonged to 14 families and 8 orders. An Order Ciconiiformes established to be dominant, representing 11 species.
- Water birds observed are Little Cormorant , Greater Cormorant, Grey Heron, Purple Heron, Little Egret, Cattle Egret, Painted Stork, Wooly Necked Stork, Glossy Ibis, Spot Billed Duck and River Tern.
- Pashan Lake is a important Lake in Pune city which attracts migratory birds.



Fig 10 11 birds near Manas Lake
Source: Pune times article

- Deforestation on nearby hills has caused heavy siltation resulting in decrease in the depth of the lake. This has reflected in reduction in the number of deep diving ducks which prefer to occupy the central deep portion of the lake.
- The surface water quality of Pashan Lake is severely degraded due to the pollution from surrounding areas directly entering the water.

7. ISSUES IDENTIFICATION-

Local people opinion- (Bhugaon, Sus)

Aspect	Issues
Environmental	Lack of awareness and conservation for preserving the forest.
	Construction of ring road will increase the noise and air pollution. Disturb the flora and fauna of the forest.
	Change in forest ecology and depths of the lakes.
Tourism activities	Much tourism activates which increases the footfall and exploit the ecology.
	More number of private campaign sites exploiting the environment and ecology.
Management	Lack of infrastructure faculties.
	Lack of cleanliness and proper management.
	Heavy traffic is observed during the peak hours. (afternoon-evening)
	Lack of NGOs creating awareness about the forest.
	Lack of utilization and management of man power to protect and conserve the forest.
Land use Pattern	Setting up of new zones needs to be regulated by a set of revised guidelines and strategies.
Administration	Approval from the forest department is of five steps which makes the process lengthy and time consuming.

8. PROPOSAL-

Activities	Bye-law	Description
Setting of industries causing pollution (Water, Air, Soil, Noise, etc.)	Prohibited	New commercial construction of any kind shall not be permitted within one kilometer from the boundary of the protected area.
Setting up of new saw mills	Prohibited	New or expansion of existing saw mills shall not be permitted.
Commercial establishment of hotels and resorts.	Regulated	No new commercial hotels and resorts shall be permitted within one kilometer of the boundary of the protected area.
Conversion of land use	Regulated	Cottage for temporary occupation of tourist, Small scale industries not causing pollution, Cottage industries including village industries.
Construction activities	Regulated	New commercial construction shall not be permitted.
Movement of vehicular traffic at night.	Regulated	Regulated for commercial purpose, under applicable laws.
Discharge of treated effluents in natural water bodies or land area	Regulated	Recycling of treated effluent shall be encouraged and for disposal of sludge or solid wastes, the existing regulations shall be followed.

Air and vehicular pollution	Regulated	No new commercial hotels and resorts shall be permitted within one kilometer of the boundary of the protected area
Commercial water resources including ground water harvesting.	Regulated at Manas lake and prohibited at Pashan lake	The extraction of surface water and ground water shall be permitted only agricultural use and domestic
Ongoing agriculture and horticulture practices	Permitted	New commercial construction of any kind shall not be permitted within one kilometer from the boundary of the protected area or up to extent of the Eco-sensitive Zone

8(b) Development control regulations-

Front, side & rear margin/ setback

Standardized building bye-law	Front Margin: for plots abutting lane less than 4.5m , setback of 2.25m from centre line of the lane is prescribed. For streets between 4.5m to 7.5m, 1.5m is prescribed. For streets between 7.5m to 12m, set-back of 2m from the road is Prescribed. For streets greater than 12m, setback of 2.25m is prescribed.
New construction/ reconstruction of building	As per DCR
Expansion/ modification of building	As per DCR
Description	Height- Marginal distances shall be increased by 1m. for buildings having height 15m. and more but less than 24m

Amalgamation of plots

New construction/ reconstruction of building	Amalgamation allowed up to maximum size of 300 Esq. for Construction. (parks, gardens)
Expansion/	No restriction for

modification of building	amalgamation for creation/ expansion of parks/ gardens
Description	Amalgamation to be regulated to avoid high traffic generating large buildings such as cinema theatres, shopping malls, vehicle service stations, etc

Chimney (kitchen)

Standardized building bye-law	Chimney up to a height of 1m is not included in the specified height of buildings
New construction/ reconstruction of building	As per DCR
Expansion/ modification of building	As per DCR
Description	There are number of restaurants/ eateries are in the 10kms and use of coal and firewood is found.

Built-up area/ FSI

Standardized building bye-law	Permissible FSI is 1.5 The built-up area in gaathan areas shall be not more than 75 per cent a)Area of plot shall not be less than 1000 Esq. b) The maximum permissible FSI shall be 20% on this plot
New construction/ reconstruction of building	FSI to be frozen to its Existing consumption at plot level
Expansion/ modification of building	FSI to be frozen to its existing consumption at plot level
Description	Exceeding the FSI, having high rise building will disturb the life of birds in the area

TDR

Standardized building bye-law	Non congested area- 2 times the surrendered area Congested area 3 times the surrendered area
New construction/ reconstruction of building	It should not be allowed inside the 10 kms area
Expansion/ modification of building	It should not be allowed inside the 10 kms area

9. PROPOSED INTERVENTIONS-

- It should focus on Conservation of natural heritage, infrastructure requirements and administration.
- Involving various NGOs for creating awareness. Kalpavriksh environment action group, Tree public
- Charging fine on cutting of trees. (Manas lake, Pashan lake)
- Monitoring of trees every month.
- Hotels discharging chemicals in the lake should be charged fine. (Manas lake, Pashan lake)
- Diversion of sewage line from the lake.
- Various NGOs and programs for protection and cleaning of lakes- applied environmental research(AERF)
- PMRDA should restrict vehicular movement within 2 kms of the lakes and forest. (Area around 2kms of manas lake, pashan lake and forest)
- PMRDA should appoint workers for the cleanliness and provide the infrastructure required.
- This will also create job oppurnitites for the local people

BIOGRAPHY:



Ar. Nikita Thorat

Masters in urban and regional planning
Faculty of architecture and planning

Since joining the Parul University, I have been involved with studies related to urban planning and approach towards the smart cities challenges



Ar. Susmita Pansare

Masters in urban and regional planning
Faculty of architecture and planning

Since joining the Parul University, I have been involved with studies related to urban planning and a approach towards the smart cities challenges

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