

MAHABLESHWAR-PANCHGANI
REGIONAL PLANNING BOARD



ENVIRONMENTAL COMMITTEE'S
REPORT

November 2003

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Introduction

Government of India vide notification No. S.O.52(E) dated 17.01.2001 declared Mahabaleshwar-Panchgani Region as an Eco Sensitive Zone. The Mahabaleshwar-Panchgani Eco Sensitive Zone (ESZ) comprises of all the villages of the Mahabaleshwar Taluka and 5 villages of Jaoli Taluka, namely, Bondarwadi, Bhuteghar, Danawali, Taloshi, and Umari. The ESZ has 2 famous hill stations of western India and forms one of the most important parts of the Western Ghats in Maharashtra. Government of Maharashtra declared the Mahabaleshwar-Panchgani area as a Region under Maharashtra Region and Town Planning Act, 1966, vide it's notification No. TPS 1982/4507(A)UD-7 dated 29.04.1983. The total area of this Region as per the notification is 23,728 ha. Out of this, 13,696.48 ha. is forest land as per the land records of the forest department. Hence forest land constitutes 57.7% of the total geographical area of the Region and the ESZ. The important issues regarding environment of the ESZ are dealt with as under.

Past experience with the Regional Plan

At the outset it is observed that in the past the provisions of the existing sanctioned Regional Plan have been grossly misused and abused and developments that were never intended as per the existing sanctioned Regional Plan have taken place.

It shall be ensured that in the Regional Plan under preparation there are no ambiguities and loopholes in the Regulations that are framed. The types and kinds of activities that are permitted shall be listed and not those that are prohibited. This ensures that no undesirable activities take place due to lack of listing of all undesirable activities such as golf courses, helipads, swimming pools and go-cart racing tracks. The Regional Plan of the Mumbai Metropolitan Region prepared by the Mumbai Metropolitan Region Development Authority and sanctioned by the State Government in September 1999 follows this principle. Hence a precedent already exists in the State and it should be followed scrupulously for the Mahabaleshwar-Panchgani Region also.

Sanctuary / Conservation Reserve

A proposal is pending before the State Wildlife Advisory Board to declare the slopes in and around the ESZ as a sanctuary. This is a welcome step and is strongly supported. If it is not possible to declare this area as a sanctuary then it should be declared as Conservation Reserve as per the provisions of the Wildlife Protection Act, 1972.

Additionally, the forested areas of the Mahabaleshwar-Panchgani plateau should also be declared as a Conservation Reserve. If it is not possible to include all the forested areas of the plateau then the forested areas of the plateau contiguous with the forests on the slopes shall be declared as Conservation Reserves. (Forested areas are not restricted to legally constituted forests in the possession of the Forest Department.)

Areas of ecological and environmental importance other than Forest Department owned or forested lands, shall also be zoned as Conservation Reserves. Likewise Zoning of areas exists in the Development Plan of Lonawala. Hence a precedent already exists in the State.

All existing slopes with a gradient of 20 degrees or more shall be treated as Conservation Reserves. The slopes shall not be permitted to be altered with terracing, etc.

Some of the areas which shall be included in the Conservation Reserves are the slopes from Kshetra Mahabaleshwar to Kate's Point and the catchment of Dhom Dam (irrespective of the degree of the slope), the rocky plateaus (e.g. 5 table lands of Panchgani, Godvali, Khingar, Ambral and Rajapuri, Wilson Point and Kate's Point in Mahabaleshwar, etc.) and the origins of waterfalls.

The Regulations for this Zone should be :

1. No collection of biological material, like endemic plants, orchids, mosses, lichens and ferns, shall be permitted except by reputed institutions and organisations working in the field of in situ ecological conservation and with the prior written permission of the High Level Monitoring Committee (HLMC) of the ESZ in consultation with the Forest Department.
2. Only temporary structures connected with in situ conservation work may be permitted by the HLMC for the ESZ in consultation with the Forest Department provided that temporary structure(s) do not stand for more than a year and leave no footprint when removed. Provided further that no temporary structure(s) shall be permitted to be constructed during the monsoon period i.e. 1st June to 30th September.
3. No other development in the Conservation Reserve shall be permitted.

Forests

The total forest area notified in the ESZ notification is about 125 sq. km. and the forest area as per Forest Department's record is 136.96 sq. km. and the said area is spread over 61 villages and out of these villages 4 villages do not have notified forest area. All forest areas shall be zoned only as a Forest Zone in the Regional Plan / Master Plan. All other forested areas which are not under the control of Forest Department shall be declared as Conservation Reserve / Community Reserve and Zoned as such.

In case any proposal for diversion of forest land is received from this ESZ area under the Forest (Conservation) Act 1980, a written opinion of the HLMC of the ESZ shall be sought by the Forest Department.

All the leased properties in Mahabaleshwar have large area covered with thick forest. A fraction of the total leased property is under use at present. All the forest areas on lease properties shall be declared as Conservation Reserves so that it is not put to any other use in the future. These areas are very essential for maintaining scenic beauty and ecological and environmental balance of Mahabaleshwar. They are also unique as they are located in the heart of Mahabaleshwar town.

Management of forested areas

Mahabaleshwar-Panchgani Region has a large extent of area under forest cover all of which is not legally constituted forest. The protection and suitable treatment of this forest is very essential to maintain the environmental balance of this Region. All forest areas should be properly demarcated so that they are not encroached.

This Region receives very high rainfall, amongst the highest in India. Therefore taking up suitable soil and moisture conservation works to protect it from erosion is very essential. Similarly, taking up afforestation works in blank patches with suitable endemic species is also required. Soil and moisture

- e) Collection of Hirda and Shikekai and other minor forest produce without causing any damage to the forest area.

Also some important changes that are required to be made in the current Maharashtra Felling of Trees (Regulation) Act, 1964, have been suggested and annexed as Annexure XI. These shall be studied and suitably incorporated by the State Government within 6 months.

Forest fires and their control

This ESZ is in the Western Ghats. In the forested areas of the Western Ghats there is a large undergrowth of grasses and herbarcious plants. These grasses and herbs dry up after the rainy season and became susceptible to forest fires. The influx of tourists in this Region increases tremendously after the rainy season. This rush of a large number of unregulated tourists in a limited area, like major tourists point, also poses a big threat to the forests, including forest fires. Usually the forest fire season is considered from mid-February to mid-June. But many a times this problem starts from December-January onwards, particularly if the rainfall is less in the preceding monsoon. The forest fires in this Region cause considerable damage to forest wealth and they spoil the scenic beauty of the forest as well. Therefore their control is very essential.

In the control of forest fires preventive measures are very important. These forest fires are man made. In the Western Ghats the villagers have a belief that if fields are burnt after the winter crop, productivity of the agricultural fields gets enhanced. Therefore they tend to burn the agricultural fields by spreading dry grasses, leaves, etc. on them. Usually this fire ignited in the agricultural fields spreads to the adjoining forest area and causes a major loss. So fire tracing in such susceptible areas is therefore necessary and shall be given priority.

Traditionally, the forest area is divided into small blocks by the Forest Department and these blocks are control burnt by the Department before the onset of the fire season as a preventive measure. Control burning requires a large amount of funds and is not a fool proof method to stop the forest fires.

Adequate fire watchers shall also be deployed by the Forest Department for early detection of forest fires and its control after detection.

In this ESZ modern methods of fire fighting are essential and required to prevent the forest fires. At suitable places in the forest area watch towers shall be made and they shall be manned continuously by the fire watches and Forest Department's field staff. These towers will also help in detecting and preventing illegal felling of trees. The Department's field staff should be provided with fast moving vehicles fitted with a wireless communication system. Wireless connection shall also be provided at each watch control tower. The wireless will be helpful in early detection of forest fires and till the wireless systems becomes operational mobile phones shall be provided to the staff. Furthermore, the staff shall be provided with fire beating equipment to extinguish the fire as early and quickly as possible.

Last but not the least, an awareness campaign should be launched in the ESZ to save the area from forest fires and the co-ordination between forest, revenue, police and farmers is very essential for this. Police Patils should be made responsible for this co-ordination.

A Forest and/or Village Protection Committee as envisaged under section 28 of the Indian Forests Act, 1927, shall be set up in each village. It shall also be the responsibility of this Committee, in consultation with the Forest Department, to control the forest fires.

Joint Forest Management shall be undertaken on priority basis in all the villages.

conservations works and afforestation of blank patches with suitable endemic species shall be undertaken.

Forest lands under the Forest Department are managed as per the Working Plan sanctioned for this area by the Government in 1995-96. A small Committee headed by Assistant Conservator of Forests, Mahabaleshwar, and comprising of experts and NGOs shall be formed to write a Working Scheme for the management of forest of the ESZ which are not under the jurisdiction of the Forest Department. This Committee shall submit its report to the HLMC of the ESZ within 6 months. After the adoption of the Working Scheme these areas shall then be managed only as per the Working Scheme and none other.

This Region has been divided into two Working Circles as per the current working plan.

The Working Circles are as follows :

The area covered under this working circle is 138.60 sq. km. and the area under ESZ as per the forest land record is 136.96 sq. km.

Mahabaleshwar Plateau Working Circle

This Working Circle covers an area of 5,567 ha. spread over 17 villages i.e. Kshetra Mahabaleshwar, Malcompeth, Panchgani, Awakali, Bhekawali, Nawali, Arendal, Bhilar, Kaswand, Metgutad, Machutar, Mangahar, Parut, Shindola, Dara, Chikhali, Bhoose comprising mainly of the Mahabaleshwar-Panchgani plateau. The main objectives and components of treatment of lands in this Working Circle are as follows :

- a) To improve the forest cover and maintain the environmental balance.
- b) To prevent soil erosion and improve the quality of forest by taking up suitable soil and moisture conservation works in the catchment of Koyna and Krishna rivers.
- c) To stop the mining activity.
- d) To take up afforestation works in blank patches and degraded forest areas to increase the forest cover.

The Plan proposes to treat 200 ha. of forest area in this Working Circle every year.

Protection and Preservation Catchment Working Circle

This Working Circle has 8,293 ha. forest area spread over 44 villages i.e. Adhal, Ambral, Bahiroshi, Nakindal, Kumbhorshi, Jawali, Haroshi, Dudhoshi, Ranadvagound, Parsond, Kumtha, Parpar, Shirwali, Metale, Birwadi, Hatlot, Kasrund, Birmani, Ghonaspur, Chaturbet, Goroshi, Dudhgaon, Zanjwadi, Dewali, Kalmbgaon, Malusar, Moleshwar, Tekwali, Ghawari, Taldev, Wiwar, Panchgani, Panghari, Tayghat, Khingar, Rajapuri, Danwali, Bondarwadi, Bhuteghar, Taloshi, Umbari, Ghureghar and Sondpar. As the name signifies, these areas are mainly the catchment areas of the rivers and steep slopes. The main objective of this Working Circle is to protect the existing well stocked forest areas and prevent erosion on steep slopes. This area mainly forms the catchment of Koyna and Dhom and other Dhom and Dhom Balkawadi irrigation projects. By protecting the forests in the catchment area the irrigation projects are also protected from siltation. The treatment prescribed to the forest area in this working circle is as follows :

- a) The felling of the trees is totally prohibited.
- b) Afforestation of the blank areas by suitable local species and planting of bamboo and canes in existing forest areas.
- c) Ban on mining in the forest area.
- d) To take up large scale soil and moisture conservation measures to prevent soil erosion and percolation of the rain water.

The misconception of the villagers that burning of fields results in better productivity should be removed. People should be made aware regarding the extent of damage that the forest fires cause to the national wealth. This should be explained to them through examples, models, charts, films, etc. Meetings of and with villagers shall be conducted before the start of the forest fire season. Dedicated NGOs or others can take up the work of adopting villages in the ESZ and *inter alia* make them aware of this evil.

In case of forest fire the villagers should bring it to the attention of the Police Patil. It should be the job of the Police Patil to immediately inform the Forest Department and simultaneously take steps to control its spread and to extinguish the fire with the help of the Forest and/or Village Protection Committee.

Prevention and control of forest fires shall also be one of the primary duties of the Sarpanch and Police Patil in every village. The Police Patil's tenure shall not be renewed unless his contribution in this regard is taken into consideration and given full weightage. Joint Forest Management shall be strengthened in these villages so that forest fires can be prevented effectively and in case any forest fire does take place, it is extinguished immediately by the villagers. A provision shall be made to reward those who provide useful information in detection and extinguishing the forest fires and on who sets them off. Suitable action under the relevant Act(s) shall be taken against those found responsible for forest fires. The action should be such that it deters others from setting off forest fires.

The environment department of Universities should also be involved and should give their students this topic for further investigation.

Biodiversity conservation

The flora of the ESZ is well known for its different vegetation due to variation in rainfall from Mahabaleshwar to Panchgani. Taxonomist have reported roughly 153 families of plants with 697 Genera and 1,452 species from this area. It is reported that this area has approximately 175 endemic species. Nearly 20 plant species from this area are included in Red Data Book of the IUCN. Mahabaleshwar is considered as one of the "Ecological Hot Spot" in the Western Ghats. The flora of this area also includes some rare ferns, algae and fungi. This area is famous for its orchid species. Most of these orchids are covered under CITES. All these species are of botanical, ornamental and commercial importance. No one shall be permitted to take any plant material from this area without special permission from the Forest Department.

The faunal diversity is no less than the floral diversity. Some of the wild animals found in this area are panthers, gours, barking deers, mouse deers, wild cats, giant Indian squirrels and civet cats.

The ecosystem of this Region is extremely fragile. No exotic species shall be introduced in this area without the approval of the silviculturist and the Forest Department, who shall first consult with NGOs, as it can damage this fragile ecosystem.

Wood as fuel

Traditionally, the local inhabitants of the villages in the ESZ use wood as fuel in their houses, collecting it from forest areas. The increase in population has put a lot of pressure on the adjoining forest areas, thereby leading to destruction and deterioration of the forests.. Hence it is essential that these poor people living in the ESZ and the adjoining villages should be freely provided with L.P.G. and Kerosene, preferably at subsidised rates. Some fuel wood is probably required during winter and rainy season for keeping the house warm; the temperature drops to single digits during the winter season and humidity is very high during the rainy season. This demand for fuel wood shall be met with by the State Government and Municipal Councils by providing non wood fuel. It may be mentioned that in I.A. 930

of 2003 in Writ Petition (Civil) No. 202 of 1995 in the Hon'ble Supreme Court the Central Empowered Committee has recommended that the State Government should provide for fuel wood by having fuel wood plantations in areas around the Matheran Eco Sensitive Zone to meet the requirements of local population.

Simultaneously, improved chullas shall be introduced in the villages to reduce the requirement of fuel wood by the local people who in any case are going to use the fuel wood to some extent.

The use of wood as fuel shall be totally prohibited once the alternate non wood fuel is supplied on regular basis.

The use of solar energy shall also be made mandatory in clubs, hotels, motels, lodging and boarding houses, large restaurants, hospitals, schools, hostels, institutions and the like for meeting their energy requirements. The directive of the State Government's Urban Development Department being Memorandum No. DCR 1094/2329/UD-11 dated 19.09.1995 on installing solar assisted water heating systems shall also be strictly implemented for the above mentioned users.

Solid Waste Management

There is large scale use of plastic water bottles, polythene bags, laminates and tetra-packs in the ESZ. Most of these are thrown in the forest area after their use. This poses a big problem. The forested areas where tourists visit is seen strewn with these wastes all over. These wastes also get drained into the streams and other water bodies and pollute them as well.

The municipal councils of Mahabaleshwar and Panchgani and the Panchayats shall provide dustbins at each and every suitable place to collect wastes, including from gaothans and congested areas. There shall be separate bins for wet and dry wastes. Those who are seen throwing these wastes outside the dustbins shall be penalised heavily by the appropriate authority. It shall be ensured that the dry wastes are collected, sorted and sent for recycling, and the wet waste is composted. This shall be accomplished within 6 months.

Hotels, motels, lodging and boarding houses, schools, hostels, institutions and clubs should compulsorily compost their wet garbage in their own property.

Subsequently, this compost can be used for agriculture, floriculture and horticulture.

The procedure of waste collection being followed by the Matheran Hill Station Municipal Council should be studied and adopted. It may be mentioned that now the local people of Matheran are so proud of and happy with their clean hill station that not only do they follow separation of garbage at source but that they stop tourists from littering and pick up any litter left behind by tourists.

No wastes shall be permitted or allowed to be throw in forested areas and valleys.

There SHALL be strict implementation of the ban on use of poly bags of size less than 20 microns. The use of cloth bags by local inhabitants and tourists shall be encouraged. This shall form one component of the Interpretation Centre(s).

The disposal of the solid waste from hospital, dispensary etc. shall be made as per the Bio Medical Disposal Act 2000.

Sewage treatment

All bungalows, restaurants, hotels, motels and lodging and boarding houses in gaothans and congested areas, and, hotels, motels and lodging and boarding houses with less than 10 rooms or 20 beds outside gaothans and congested areas shall have septic tanks that are regularly cleaned and maintained. This shall be monitored by the Maharashtra Pollution Control Board (MPCB).

All other hotels, motels, lodging and boarding houses, clubs, institutions, hostels and residential schools shall have a sewage treatment plant with independent electricity and water meters. The municipal councils shall not pass any development plans if the sewage treatment plant is not part of the proposal. The MPCB shall ensure that the sewage treatment plants are functional and operational. Existing developments shall install the sewage treatment plant within a period of one year.

The MPCB shall immediately investigate and report the sewage treatment facility available with each hotel, motel, lodging and boarding house, club, school, hostel and institution. The report shall be made public and handed over to the HLMC of the ESZ. The report shall include such details as the number of rooms, number of beds, peak and average occupancy, water consumption, size and capacity of sewage treatment facility, cleaning periodicity, etc. The concerned officers of the MPCB shall be prosecuted under the Environment (Protection) Act, 1986, if the report is not made available within 6 months or if there are inaccuracies or false information in the report.

Both municipal councils shall provide underground drainage system of sewage from all other areas, especially from gaothans and congested areas. This shall be collected and treated at appropriate place(s) using methods and technologies appropriate for hill areas. After treatment, this water can be used for irrigation. This shall be accomplished in the next 3 years.

No untreated sewage water shall be disposed off anywhere, especially into streams or any other water body.

It shall be the duty of the electricity and water supplying authorities / companies to bring to the notice of the HLMC of the ESZ and the MPCB if it is found that no power or water has been consumed for the sewage treatment plant.

Traffic management

Large number of vehicles enter the ESZ, especially during the tourist seasons. This causes traffic problems and noise pollution. It is essential to put some restrictions on these vehicles entering this ESZ to maintain the environmental balance of this area. Large number of vehicles use the ESZ to travel between the coastal plains and the Deccan Plateau. The use of the ESZ for through traffic shall be banned. At the very least it shall be banned during the tourist seasons and a heavy tax shall be imposed on them by the District Collector to discourage them for using this route; the money so collected shall be made available directly to the Forest Department at Satara.

Certain restrictions that are a must in both the municipalities are :-

- a) There shall be no increase in the road infrastructure, except to connect the newly authorised and legally developed / developing areas.
- b) Road winding shall not be permitted.
- c) The entire Bazaar area in Mahabaleshwar shall remain a pedestrian plaza.
- d) All pedestrian plazas, including at and near points, walks, rides, etc. shall be marked on the plans as such.
- e) Proper parking lots and areas shall be provided near pedestrian plazas so as not to hamper movement of other/passing traffic.

- f) Parking lots shall be provided in the Development Plans of Mahabaleshwar and Panchgani, wherein at least 30% of parking lots shall be reserved for buses.
- g) Congestion in the market areas of Panchgani shall be cleared through proper traffic management.
- h) Tarmacing of rides and paths shall not be permitted.
- i) Battery assisted cycles and vehicles as mode of local transport shall be promoted.
- j) Vehicles to Arthur's Seat shall be banned. All vehicles shall be stopped at Kshetra Mahabaleshwar and from there tourists can either walk, cycle or travel in battery operated tempos/mini buses. These facilities shall to be provided only by the locals / Municipal Council.
- k) Till the ban on vehicles to Arthur's Seat takes place, the timing for plying of small and large buses shall be determined and strictly adhered to.

A parking lot shall also be provided at or near the entrance of the hill station. Only limited number of vehicles using diesel and petrol shall be allowed inside the towns on the basis of first come first priority basis. Other vehicles shall be stopped at these parking places. The municipal councils or private enterprises should be encouraged to provide transport in both the municipalities from these parking lots using smaller vehicles which are battery powered or use L.P.G. / C.N.G. A percentage of the parking charges shall be made available directly to the Forest Department at Satara to *inter alia* maintain the rides and tourist spots.

The number of vehicles that may be allowed to enter Mahabaleshwar and Panchgani shall be limited to 75% of the maximum number of vehicles that plied in the towns prior to 17.01.2001, the day the ESZ notification was issued by the Ministry of Environment & Forests. The modalities of how this is to be achieved shall be worked out by the State Government in consultation with NGOs.

Bicycles and vehicles running on battery power, L.P.G. or C.N.G. shall be encouraged in this region to keep control on air pollution. The vehicles running on petrol and diesels shall be discouraged and local vehicles running on these fuels shall be withdrawn in a phased manner.

In the next 3 years all buses that ply within or through the ESZ shall be those that run on C.N.G. or similar low polluting fuels.

The congested areas and gaothans of the municipal councils shall be made pedestrian plazas and vehicular traffic there should be totally banned to avoid traffic problems.

All traffic to Arthur's seat shall be stopped at Kshetra Mahabaleshwar. From there the tourists can go either on foot, bicycles or battery / L.P.G. / C.N.G. operated vehicles. No large or heavy vehicles shall be permitted to ply between Kshetra Mahabaleshwar and Arthur's seat.

Pollution Under Control certificate shall be mandatory for all vehicles that ply in or through the ESZ. This certificate shall be checked by the police or any other suitable Authority or agency at the entrances of the ESZ.

Noise pollution

In order to check noise pollution loud horns (sound more than 50 dB), cone type loudspeakers, etc. shall not be permitted. The rules framed by the Police in Mumbai in this regard shall be adopted.

Tourism

The ESZ notification stipulates that the State Government shall prepare a Tourism Master Plan based on Carrying Capacity of the area. The Carrying Capacity study has not yet begun.

Prima facie, based on available information and data, the Carrying Capacity of the area appears to have been exceeded. Pending the results of the Carrying Capacity study, it is of paramount importance that the number of tourists should not be allowed to exceed the current levels.

The Mahabaleshwar-Panchgani Region presents a vast scope for alternate forms of tourism, like historic, religious, architectural and nature based. These alternate forms of tourism should be promoted over the conventional forms. This will also take the pressure off the two towns and spread it more evenly across the entire Region. All tourism promotion shall be based and focused on these alternate forms of tourism. Henceforth conventional tourist attractions shall be discouraged and not permitted. Tourism activities not keeping with the character of the Region, such as go-carting, swimming pools, amusement parks, water parks, helipads, ropeways and golf courses, shall not be permitted and shall be specifically prohibited.

Tourists shall be informed of the various forms of tourism at the Interpretation Centre(s). One, two and three days alternate tourism packages shall be prepared and tourists should be encouraged to avail of them depending upon the duration of their stay in the Region. They shall be acquainted with these alternate forms of tourism through the visual and audio-visual media. A short film on these forms of tourism shall be shown at the Interpretation Centre(s).

The number of tourists that visit the ESZ shall be restricted to the number that visit today. One way is by not permitting new hotels, motels and lodging and boarding houses in Mahabaleshwar and Panchgani. Existing hotels, motels and lodging and boarding houses shall not have more than 6 rooms per acre of plot size, as per the Development Control Regulations of Matheran (which has also been declared as Eco Sensitive by the Ministry of Environment & Forests on 4 February 2003).

Bed and Breakfast should be encouraged in gaothans subject to a maximum of 2 rooms and 4 beds per house and shall be approved by the Maharashtra Tourism Development Corporation (MTDC). Hotels, motels and lodging and boarding houses shall not be permitted in gaothans.

Only 5% of the total plots in the Residential Zone outside the gaothan of every village shall be permitted to be developed into a hotel, motel, hostel or lodging and boarding house. This will ensure even distribution of tourist accommodation over the entire Region, besides also providing employment to the villagers.

Guides shall be jointly trained by the Forest Department and MTDC and turned into Eco-guides. They shall be licensed by and registered with the MTDC, without which they shall not be allowed operate as tourist guides.

Interpretation / Information Centres should be set up to educate the local people and tourists. Such Centres could be located at / near Venna Lake in Mahabaleshwar and at / near S.T. stands.

To reduce the pressure of tourism on the Mahabaleshwar-Panchgani Region amenities and infrastructure at existing areas close by shall be increased. Such areas could be Tapola, Wai, Dhoni, etc. However such promotion of other close by areas shall not result in ecological and environmental degradation of that area. Given the ecological value, sensitivity and fragility of the Western Ghats in this area, development of completely new sites / areas for tourism shall not be done.

A separate wing of the Forest Department shall be set up to promote and facilitate ecotourism.

Rocky Plateaus

There are several lateritic plateau tops in the ESZ. The best known are the five plateaus around Panchgani. In Mahabaleshwar the best known is Wilson Point. These are very special ecosystems as they are limited in size and number. They are thus of great ecological significance.

The plants that grow on these rocky outcrops are specially adapted to these unique conditions. They are capable of growing in extremely limited amounts of soil. A centimetre or less of this soil is enough to support their monsoon growth. The rock strata is acidic to which these plants have adapted.

Most of these herbs that grow on the plateaus are monsoon plants. They spring out of the ground once it starts raining, grow rapidly, flower in a short spell and die. Thus every few days there may be a change in the floral composition. A fair proportion of these species are endemic which do not grow elsewhere. Some are rare or threatened. Several species of ground orchids are present on the plateaus.

The current threats to these highly sensitive microhabitats are due to a variety of causes. This includes traditional pressures such as cattle grazing. But much more severe is the pressure from uncontrolled tourism. These very fragile systems if used for tourists who come for various attractions including giant wheels, fast food, horse rides and other activities can severely damage this ecosystem. The pattern of tourism shall be re-organised so that only a few pathways to access view points by foot are used. All vehicles shall be stopped on or before the slopes near the entry point to the plateaus. Existing fun centres shall be moved out of the plateaus. A limited amount of controlled rotational grazing may be permissible, as the effect of overgrazing and / or banning of grazing may have yet unknown effects on the plant composition. This aspect requires urgent studies by trained plant ecologists with a special interest in rock outcrops. Other aspects of management will also emerge once baseline data is collected. These aspects of management shall then be strictly observed.

There shall be a ban on any form of change in land use on these plateau tops and some of the unfortunate trends that have happened in the past shall be reversed, i.e. the permissions to put up structures like giant wheels, food stalls and horse rides shall be revoked.

On the Panchgani plateau half the plateau's rocky substrate and soil has been powdered into fine dust and crumbled rocks on which such plants are unlikely to survive in their original communities. This is due to large amount of traffic, ferris wheels, camel tracks, horse tracks, etc. The rest of the plateaus shall not be permitted to go in the same way. No other plateau shall be used for such purposes.

For the present, some level of protection is a must and guards shall be posted at the access point to the plateaus. Passes shall be given for cattle grazing and alternate fodder supply organised for the shortfall. No construction of any type shall be permitted for both ecological and aesthetic reasons.

Protection of these isolated patches may not be easily feasible in the form of a wildlife sanctuary through this would indeed be most desirable, at least for the larger and / or more valuable areas. Plateaus and their slopes shall be Zoned as Conservation Reserves. Approach roads shall be closed and any type of motorised transport and walking on the plateau top shall be restricted to a few identified pathways so that tourists can access a few identified view points. No other form of land use shall be permitted in these Conservation Reserves.

The lateritic flat tops of Western Ghats (Sahyadri) are called as "Plateaus" or "Table lands" and locally known as "Sadas". Plateaus possess very characteristic herbaceous ephemeral vegetation. Plateaus have grassy, ephemeral herbaceous flora, shrubby vegetation and are generally with less tree cover. Plateaus are generally wrongly considered as barren land but biologically plateaus are very important. Even though plateaus are very poor in shrubby and tree vegetation, monsoon herbaceous flora is very rich in diversity. Herbaceous flora of the plateau includes more than 200 species of different plants, such as Impatiens, Utricularias, Eriocaulons, Ground orchids, Smithias, Dipcadies, Uregenias, Euphorbias

Sedges Senecioias, Ceropogias, Rotalas, Disophyllas, Strobilanthusas, etc. The plants change their colours after ever 15-20 days as monsoon progresses from June to October, with yellow colours of Senecioias and Smithias, blue colours of Utricularias, pink-rosy colours of Impatiens, white colours pf Eriocaulons and habenarias, purple colours of Strobilantheses, etc. The panorama of the plateaus in the months of August-September strikes the eyes.

Many rare endemic endangered plants grows on plateaus. In the recent decades more that 50 new plants species have been reported by various scientist from the plateaus of Western Ghats of Maharashtra (Sahyadri), which are new for Botanical Science. The rate of evolution of new plant species by the natural processes is more in herbaceous flora that grows on plateaus. Majority of the plant species grows on plateaus are very rare, less in population and in endangered status. Many of them are recorded in "Red Data Book". Botanically very little is known about them and their economic and medicinal values are still unknown to science. Plateaus of Western Ghats of Maharashtra are the Ecologically Sensitive Areas and Regions of Endemism and Speciation.

Wild animals use the plateaus as "corridor" for their migration. Herbivorous wild animals feed on the plants grows on plateaus. Carnivorous animals also use the plateaus as "hunting site". Large crevices present beneath the plateaus are used by wild animals as "breeding sites".

No planting of trees should be permitted on these rocky plateaus. Limited grazing by a limited number of cattle, as existing on 17-01-2001 (the date of the Mahabaleshwar-Panchgani Eco Sensitive Zone), may be permitted to continue. Care should be taken that the number of cattle grazing on these plateaus do not increase.

The known rocky plateaus of the ESZ like the five table lands of Panchgani, Godvali, Khingar, Ambral, Rajapuri, Wilson Point and Kate's Point in Mahabaleshwar shall be preserved at any cost.

In delineating the Conservation Reserve for the rocky plateaus the slopes all around the plateau shall also be included up to the major metalled PWD road below it. The lowest contour level of this road shall form the boundary of the Conservation Reserve.

Origins of waterfalls

Recent studies have shown that origins of waterfalls are home to and repositories of a number of endemic species of flora. These areas need to be zealously guarded. The origins of waterfalls need to be preserved, conserved and protected. Hence no development of and around them shall be permitted. The origins of waterfalls shall be zoned as Conservation Reserve. In delineating the Conservation Reserve around the origins of waterfalls a circle of 100 mt. aerial distance for the origin of the waterfall shall be considered. Further, all steps shall be taken to ensure that there is absolutely no pollution of the water upstream, including from dairies, as this would effect the flora at the origin of the waterfall.

Industries

No industrial estates or areas are needed or recommended.

The ESZ notification is clear in the kind of industries permitted. The types and kinds of industries that may be permitted are restricted to those that are currently operating in the ESZ.

A strict control shall be kept on agriculture, floriculture and horticulture practices and industries based on them to ensure that they do not cause any air or water, surface or groundwater, pollution.

Pollution of water due to agricultural practices needs special attention. The State Government has recently begun promoting organic farming. Along with other places the State Government shall adopt this ESZ for promotion of organic farming.

Strict control on construction for the permitted industries shall be maintained and exercised to ensure that there are no violations and the constructions are used only for the purposes for which they are sanctioned. This is specifically mentioned as misuse and violations have been reported, especially with reference to constructions for mushroom farming / rearing.

Quarrying and Mining

In addition to the provisions of the ESZ notification, no quarrying or mining is permitted on steep hill slopes or areas with a high degree of erosion. Quarrying and mining where permitted should be after site evaluation. These additions have been prescribed by the Ministry of Environment & Forests for the Matheran Eco Sensitive Zone notified vide notification no. S.O.133(E) dated 4 February 2003. A "steep hill slope" has been defined by the Ministry as one having a gradient of 20 degrees or more.

Control on fertilisers, insecticides and pesticides

The Mahabaleshwar-Panchgani Region is known for their berries and certain vegetable crops. Large scale use of fertilisers, insecticides and pesticides is made in growing these. These have entered the ecosystem and are showing its harmful effects. The number of pollinators have reduced due to their use. They also get drained into the streams and pollute the waters that is also used for drinking. This large scale use of fertilisers, insecticides and pesticides has a harmful effect on the other beneficial micro flora also. Therefore use of fertilisers, insecticides and pesticides in this Region shall be phased out in 5 years. Farmers shall use biological control and practice organic farming. This shall be done so that the ecological and environmental balance is not disturbed in the long run. The State Government is promoting organic farming. Along with other places the State Government shall adopt this ESZ for promotion of organic farming. Simultaneously the harmful effects of the chemical / inorganic fertilisers, insecticides and pesticides shall be communicated to the farmers. The general awareness level of the farmers shall be increased.

Forest leases

There are some forest lands given out on leases in the ESZ. When these leases expire the lands should revert back to the Forest Department. These lands could then be put to various uses such as fuel wood plantation, interpretation centres, etc.

Gaothans / Congested areas

The village gaothans shown in the Revenue Department records are presently considered as congested area and the FSI is permitted accordingly. However, the gaothans which have a low density shall not be considered as gaothan / congested area for allowing the permissible FSI for such areas. It is therefore suggested that gaothans having a density of less than 100 persons per hectare shall not be considered for granting FSI permissible for such gaothan / congested areas.

Gaothan expansion may be permitted by the Monitoring Committee based on needs and requirements of and for the existing *bona fide* gaothan residents only.

Kshetra Mahabaleshwar

The existing village Panchayat of Kshetra Mahabaleshwar shall be strengthened to control the development in this area by providing adequate and sufficient human resources and financial backup.

Miscellaneous issues

1. Family welfare programmes shall be undertaken.
2. Consumerism in the ESZ shall be curtailed and restricted.
3. A Kerosene Pump shall be set up in Mahabaleshwar and Panchgani.
4. Due consideration shall be given to the proposals and recommendations of this Report, including those of reservations in the various Plans, when proposals for development of plots are received.
5. The plateau edges, upper valley portions and small plateaus below the main plateau are special in the type of vegetation that grows here. Development permission shall not be granted if it is on any of these. The A.D.T.P., Satara, and D.D.T.P., Mahabaleshwar-Panchgani Regional Planning Board, shall make available copies of the Plans on which this Committee shall mark out such areas.
6. A stream restoration programme shall be undertaken that will *inter alia* include measures to be adopted to prevent pollution of the streams.
7. The Forest Department shall start a nursery of endangered and endemic plants.
8. The Development Control Regulations shall be framed tightly and no loopholes shall be left. They shall specifically :-
 - a) Prohibit construction of airstrips, go-cart tracks, swimming pools, amusement parks, water parks, helipads, ropeways and golf courses.
 - b) Dumping of construction material anywhere outside the property being developed.
 - c) Prohibit granting of additional Floor Space Index / Floor Area Ration to hotels, motels, lodging and boarding houses, schools, hostels, clubs and institutions.
 - d) Prohibit construction of 3-star and above category hotels.
 - e) Prohibit construction of large hotels with more than 10 rooms or 20 beds.
 - f) Prohibit construction of basement, stilt and mezzanine floors. However, in Sector I, Mahabaleshwar, stilt floor open on all sides without any rooms may be permitted only by the Collector for parking purposes only. The stilt floor shall be included in the permissible height as per the ESZ notification.
 - g) Mandate the installation of Solar Assisted Water Heating Systems for clubs, hotels, motels, lodging and boarding houses, large restaurants, hospitals, schools, hostels, institutions as per directive of the State Government's Urban Development Department being Memorandum No. DCR 1094/2329/UD-11 dated 19.09.1995.
 - h) Mandate the installation of Display Boards at sites being developed as per directive of the State Government's Urban Development Department being Memorandum No. TPB 4394/1504/CR 287/94/UD-11 dated 22.07.1998. A copy of the Memorandum is at Annexure-IV.
 - i) Mandate the display of the survey number / CTS number / Gat number at the main entrance of the property along with the village name and road.
 - j) Mandate rain water harvesting especially for hotels, motels, lodging and boarding houses, clubs, schools, institutions, hostels and other such large users.

- k) Not permit Transfer of Development Rights (TDR) or Development Rights Certificate (DRC) or their equivalent or such similar Rights to be generated from forest, Government or municipal owned or leased lands.
 - l) Not permit Transfer of Development Rights (TDR) or Development Rights Certificate (DRC) or their equivalent or such similar Rights to be generated in any form or manner, except those under Heritage Regulations.
 - m) Not permit the change of name of a heritage site without the approval of the Heritage Conservation Committee.
 - n) Not permit change in the status of viewing points, natural paths, walks, rides, etc. with development(s) and should remain as they are.
 - o) Not permit tarring of walks, rides and paths.
 - p) Provide that if a tree has been cut on a property without clearance then no development permission should be given on that property by the Appropriate Authority till an endemic tree has been planted in its place and it is seen that the tree has survived for at least 5 years after planting.
 - q) Stalls and such like structures shall be allowed only at designated places or spots.
 - r) Stipulate separate and independent water and electricity meters for sewage treatment plants.
 - s) Prohibit signage and advertisements on rocks.
 - t) Prohibit the removal of dead wood unless it is obstructing a path, walk, ride or road.
 - u) Prohibit the removal of shrubs and undergrowth from forests, unless required as part of in situ conservation work.
 - v) Prohibit the painting of all structures made of natural material, such as stone, earth and mud.
 - w) Prohibit any hoarding blocking the view of or from any heritage building or site, or areas of natural beauty.
 - x) Prohibit the use of leasehold plots for commercial activity such as hotels, motels, etc. and no such existing activity shall be regularised.
9. The use of fuel efficient chulahs shall be encouraged.
10. The Government of Maharashtra notification dated 26 November 1996 regarding setting up of hill stations shall not be made applicable to this Region.
11. The Regulations of the Government of Maharashtra regarding permitting development of Information Technology in Agriculture Zone / No Development Zone shall not be made applicable to this Region.
12. No amendment to the Regional Plan(s) by the State Government shall be made applicable to this Region unless it is approved by the Ministry of Environment & Forests in consultation with the HLMC of the ESZ.

ANNEXURE – I

FLORA OF MAHABALESHWAR

PLANTS OF MEDICAL VALUE IN THE
MAHABALESHWAR-PANCHGANI AREA

This area has plenty medicinal plants. The following plants are used for the medicinal value in treatment of various ailments by local *vaidyas* :

Abrus precatorius, Abutilon indicum, Acacia leucophloea, A. nilotica ssp. Indica, A. sinuata, Acalypha indica, Achyranthes asper, Actinodaphne hookeri, Adhatoda vasica, Aerva lanata, Agave americana, Ageratum conyzoides, Albizia lebbeck, Allium cepa, A. sativum, Anacardium occidentale, Argemone mexicana, Asparagus racemosus, Azadirachata indica, Bacopa monnieri, Balanites aegyptiaca, Barleria cristata, B. prioniti, Bauhinia purpurea, B. racemosa, Bixa orellana, Blumea ciantha, B. lacera, Boerhavia diffusa, Boswellia serrata, Brassica campestris, Butea monosperma, Casasal pinia bonduc, Calendula officinalis, Calotropis gigantea, Calycopteris floribunda, Capparis decidua, C. spinosa, Cardiospermum halicacabum, Carica papaya, Carissa congesta, Carthamus tinctorius, Cassia auriculata, C. fistula, C. tora, Catharanthus roseus, Celastrus paniculatus, C. argentea, Centella asiatica, Ceropogia bulbosa, Chenopodiurn album, Cinnamonum zeylanicum, Cissampelos pareira, Citrullus colocynthis, C. lanatus, C. vulgaris, Clematis triloba, Clerodendrum serratum, Clitoria ternatea, Coix laeryma-jobi, Commalina benghalensis, Crotalaria rewsa, Cureuligo orchioides, Curcuma aromatica, Cynodon daetylon, Datura metel, Dioscorca oppositifolia, Diospyros melanoxylon, Echinochloa erusgallii, Echinops echinatus, Eclipta prostrata, Gmblica officinalis, Emilia sonchifolia, Evolvulus alsinoides, Ficus benghalensis, Garcinia indica, Gnidia glauca, Gloriosa superba, Helicteres isora, Hemidesmus indicus, Hibiscus rosasinensis, Hiptage benghalensis, Holarrhena antidysenterica, Homonoia riparia, Impatiens balsamina, Jatripha curcas, Lantana camara, Lawsonia alba, Leonotis nepetaefolia, Leucas aspera, Mahastrum coromandeliaman, Mangifera indica, Memecylon umbellatum, Mirabilis jalapa, Momordica charantia, Moringa oleifera, Mitragyana parviflora, Ocimum spp. Pergularia daemia, Pittosporum wightii, Plantago major, Plumbago zeylanica, Rauolfia serpentina, Ricinus communis, Rosa multiflora, Rubia cordifolia, Santalum album, Scilla hyacinthina, Semecarpus anacardium, Sesamum indicum, Solanum nigrum, S. surattense, Sphaeranthus incicus, Swertia densiflora, Tagetes erecta, Terminalia bellirica, T. chebula, Tinospora cordifolia, Trobutus terrestris, Tylophora indica, Verbascum chinense, Vitex negundo and Wattakaka volubilis.

ANNEXURE – II

IMPORTANT FODDER SPECIES

The plants known for their fodder value are mostly grasses viz. *Andropogon pumilus*, *Arundo donax*, *Brachiaria cruiiformis*, *Cenchrus ciliaris*, *Chloris virgata*, *Coix lacryma - jobi*, *Cynodon dactylon*, *Dactyloctenium aegyptium*, *Dichanthium annulatum*, *D. foveolatum*, *Dineora retroflexa*, *Diplachne fusca*, *Echinochloa colonum*, *E. crus-galli*, *Eleusine indica*, *Eragrostis gangetica*, *E. tenella*, *E. unioloides*, *E. viscosa*, *Hackelochloa granularis*, *Heteropogon contorus*, *Isachne globosa*, *I. Miliacea*, *Iseilema anthephoroides*, *Oplismenus burmannii*, *Panicum antidotale*, *Paspalum scrobiculatian*, *Pennisetum americanum*, *P. glaucum*, *Saccharum offidinarum*, *Sehima nervosum*, *Sorghum halepense*, *Spodiopogon rhizophorus*, *Sporobolus coromandelianus*, *S. indicus var. diander*, *Thelepogon elegans*, *Themeda quadrivalis* and *Urochloa panicoides*.

The leaves, young shoots or pods of the following plants other than grasses are fed to cattle:

Acacia nilotica ssp. indica, *Achyranthes aspera*, *Adhatoda vasica*, *Albizia lebbeck*, *Amaranthus spinosus*, *Hiptage benghalensis*, *Holarrhena antidysenterica*, *Indigofera cordifolia*, *Kydia calycina*, *Lagerstroemia parviflora*, *Lannea coromandelica*, *mallotus philoppinensis*, *Melilotus indica*, *Microcos paniculata*, *Phyllanthus emblica*, *Polygonum barbatum*, *Pongamia pinnata*, *Portulaca oleracea*, *Prosopis cineraria*, *Ziziphus mauritiana*, *Z. rugosa* and *Vigna trilobata*.

ANNEXURE – III

INTERESTING PLANTS OF BOTANICAL VALUE

Various botanists have described 44 new species, 5 varieties and 1 forma from entire the Satara district. They are : *blatt.*, *Aponogeton satarensis* Raghavan et al., *Blatt.*, *Argyreia boseana* Sant. & Patel, Almeida. *Balanophora elkinsii* Blatt., *Barleria gibsonioides* Blatt., *Begonia prixophylla* Blatt., & McC., *Caralluma adscenedens* var. *fimbriata* Gravely & Mayur., *Ceropegia hispida* Blatt., & McC., *C. noorjahaniae* Ansari, *C. panchganiensis* Blatt., & McC., *Coelachne minuta* Bot, *Crinum clconorae* Blatt. & McC., *C. clconorae* var. *purpurca* McC., *C. woodrowii* Barker, *Cyperus decumbens* Govind., *Dichanthium maccannii* Blatt., *D. panchganiense* Blatt., & McC., *Dipcadi maharashtrensis* Deb & Dasgupta, *D. ursulae* Blatt., *Eriocaulon clconorae* Fyson, Fyson, *E. sedgwickii* Fyson, *Euphorbia panchganiensis* Blatt & McC., *Habenaria cerea* Blatt., & McC Blatt. & McC., *H. panchganiensis* Sant. & kap., McC., *Iphigenia stellata* Blatt., *Isachne lisboae* Hook. f., I. Swaminathanii Ved Prakash & Jain. *Kalanchoe bhidei* T. Cooke, *mariscus blatteri* McC., *Oxalis corniculata* var. *hispida* Blatt., *Pancratium donaldii* Blatt. *Thalictrum obovaum* Blatt., *urginea polyantha* Blatt., & McC., and *U praeterita* Taylor.

Of these species mentioned above. *Aneilema siennea*, *Arisaema longicaudatum*, *Arthraxon satarensis*, *Cryptocoryne tortuosa*, *Eriocaulon horsley-kundae*, *Habenaria cerea* var. *polyantha*, *H. variflora* var. *latifolia*, *H. spencei*, *H. variabilis*, *Oberonia lingmalensis*, *Oldenlandia maheshwarii*, *Paspalum canarae* var. *funbriatum*, *Peristylus vanthochlorus*, *Utricularia equiseticaulis* and *U. ogmosperma* have been merged under different taxa by various workers as they were not distinct.

Abelmoschus angulosus, *Crassocephalum crepidioides*, *Habenaria multicaudata* and *Sagina japonica* are the distributional records for Maharashtra reported from this area.

ANNEXURE – IV

ENDEMIC AND RARE PLANTS

There is a high concentration of endemic species along Western Ghats due to significant variation in altitude, humidity, soil, temperature and various other factors. Endemic plants occur in a restricted area, isolated from its surrounding regions through geographical, ecological or natural barriers. Western Ghats along this tract form an ecological boundary between the low-lying plains, Konkan and the Deccan tableland forming an ideal endemic area. There are 56 genera endemic to Peninsular India. (Nayar, 1980) out of which the following 10 monotypic genera are endemic to Western Ghats and occur in the area studied here : *Carvia Dicoelospermum*, *Erinocarpus Helicanthes*, *Indopoa*, *Moullava*, *Polyzgis*, *Pseudodichanthium*, *Seshagiri* and *Trilobachne*. Ahmedallah and Nayar (1987) have discussed in detail about the concepts, classification and components of endemic plants of Peninsular India.

Species endemic to the district are - *Aponogeton satarensis*, *Argyreia boseana*, *Balanophora elkinsii*, *Barleria gibbosonioides*, *Begonia prixophylla*, *Carallume adscendens* var. *jimbriata*, *Ceropegia noorjahaniae*, *C. santapau*, *Crinum cleonora*, *C. woodrowii*, *Cyperus decumbens*, *Dichanthium maccannii*, *D. panchganiense*, *Dipcadi maharashtrensis*, *D. ursulae*, *Drimia polyantha*, *Euphorbia panchganiensis*, *Hitchenia caulina*, *Iphigenia stellata*, *Isachne swaminathanii*, *Mariscus blatteri*, *Oxalis corniculata* var. *hispida*, *Pancratium donaldii*, *Thalictrum obovatum* and *Utricularia praeterita*.

Species endemic to the Western Ghats represented in the district are *Adelocaryum malabaricum*, *Adenoon indicum*, *Aeschynanthus perrottetii*, *Aglaia lawii*, *Alysicarpus pubescens* var. *vasavadae*, *Alysicarpus belgaumensis* var. *racemosa*, *Anisomeles heyrleana*, *Argyreia cuneata*, *Arisaema caudatum*, *A. murrayii*, *Arthraxon lanceolatus* var. *meeboldii*, *Asystasia dalzelliana*, *Artocarpus hirsuta*, *Blachia denudata*, *Blepharis asperrima*, *Blumea belangeriana*, *Cajanus lineatus*, *C. sericea*, *Campanula alphonisii*, *Canscora concanensis*, *C. pauciflora*, *C. perfoliata*, *Carex filicina* var. *glaucina*, *Carissa inermis*, *Carvia callosa*, *Ceropegia occulata*, *C. vincaefolia*, *Chlorophytum glaucum*, *Coelachne minuta*, *Crotalaria filipes*, *Cryptocoryne spiralis*, *Cucumis setosus*, *Cyanotis concanensis*, *C. fasciculata* var. *glabrescens*, *Dalzellia zeylanica*, *Delphinium malabaricum*, *Dichanthium jainii*, *Dimorphoclyx lawianus*, *Dioscorea belophylla*, *Eranthemum roseum*, *Eriocaulon breviscapum*, *E. dalzellii*, *E. diana*, *E. eleonora*, *E. humile*, *E. odoratum*, *E. ritchieanum*, *E. stellulantum*, *E. vanhecurckii*, *Ervatamia heyneana*, *Euphorbia dlipticum*, *E. notoptera*, *Exacum lawii*, *Garcinia indica*, *Haplanthodes neilgherryensis*, *H. tentaculatus*, *H. verticillatus*, *Hedyotis stocksii*, *Helicanthes elastica*, *Helixanthera obtusata*, *Heracleum aepulegifolium*, *H. grandis*, *Heteropogon polystachyos*, *Holiga grahamii*, *Impatiens dalzellii*, *I. minor*, *I. pulcherrima*, *Indigofera dalzellii*, *Isachne bicolor*, *I. lisboa*, *Ischaemum*

diplopogon, *I impressum*, *I. ritchiei*, *Ixora brachiata*, *Jasminum malabaricum*, *Justicia santapau*, *J. trinervia*, *J. wynaadensis*, *kalanchoe bhidei*, *K. olivacea*, *Lavandula gibsonii*, *Litsea stocksii*, *L. wightiana*, *mallotus stenanthus*, *Meiogyne pannosa*, *memecylon malabaricum*, *M talbotianum*, *Moullava spicata*, *Murdannia crocea* ssp. *Ochracea*, *M. lanuginosa*, *M. versicolor*, *Mussaenda laxa*, *Neanotisconcanensis*, *N. hohenackeri*, *N. montholonii*, *N. rheedu*, *Nilguparthus lupulinus*, *N. reticulatus*, *Phyllocephalum tenue*, *Pimpinella katrajensis*, *Piper hookeri*, *Pittosporum dasycaulon*, *Plectranthus benghalensis*, *P. stocksii*, *Pleocaulis ritchiei*, *Pogostenmon deccanensis*, *P. purpuraseens*, *Polygyus tubersus*, *Porana racemos*, *Pseudodichanthium scrrrefalcoides*, *Rhamphicarpa longiflora*, *Senecio dalzellii*, *Seshagiria salvadrica*, *S. bigemina*, *S. setulosa*, *Sonerila seapigera*, *Supushpa scrobiculata*, *Thalictrum dulzellii*, *Thelepacpale txiocephala*, *Tricholepis amplexicaulis*, *T. radicans*, *Tolypanthus lagenifer*, *Trilobachne cookei*, *Utricularia arecuata*, *Ventilago bombaiensis*, *Vernonia indica*, *Vigna khandalensis*, *Wendlandia thyrsoides* and *Zingiber neesanum*.

Rare species – either in distribution or abundance are – *Arnicratea grahamii*, *Beilschmiedia dalzellii*, *Bergia ammannioides*, *Canseora khandalensis*, *Cansjera rheedii*, *Capparis grandis*, *Cayatia trifolia*, *Ceropegia bulbosa*, *Cissus pallida*, *C.repens*, *Cynanchum callialata*, *Dendrophthoe trigona*, *Disopyros nigrescens*, *Holostemma ada – kodien*, *Impatiens lawii*, *Isachne gracilis*, *kickxia incana*, *Limnophila heterophylla*, *Litsea fuscata*, *Loeseneriella obtusifolia*, *Mussaenda glabrata*, *Myristica dactylodies*, *Phaulopsis imbricata*, *Polygonum barbatum*, *Rauwolfia serpentina*, *Sauromatum pedatum*, *Schefflera elliptica*, *Sterculia guttata*, *Tinospora cordifolia* and *Tylophaora fasciculata*.

ANNEXURE – V

IMPORTANT Vegetation of this area

Floral Species	Vernacular Name	Vegetal Character	Relief Character
<i>Memecylon umbellatum</i>	Anjan	Exclusive Undergrowth	Steep Slope
<i>Actinodaphne hookeri</i>	Pisa	Middle sized tree	-
<i>Randia dumetorum</i>	Gela	Large Deciduous Shrub	-
<i>Atlantia racemosa</i>	Ran Limbu	Small tree /Shrub	-
<i>Capparis spinosa</i>	Arab	Trailing Shrub	Moist face of Ghats
<i>Maesa indica</i>	Kirithi	Small tree / big shrub	-
<i>Sapindus laurifolius</i>	Ritha	Large tree; numerous leaflets	-
<i>Woodfordia floribunda</i>	Dhaiti	Large ornamental Shrub	-
<i>Strobilanthes callostus</i>	Karvi	Large shrub, underwood	30 feet height
<i>Jasminum malbaricum</i>	Chameli	Middle sized tree	-
<i>Heterophragme roxburghii</i>	Warsi	Large tree	-
<i>Oleo dioica</i>	Kara-Amba	Middle sized tree	-
<i>Scutia indica</i>	Chimat	Shrub	-
<i>Litsea tomentosa</i>	Chikna	Middle sized tree	-
<i>Mallotus philippinensis</i>	Raini	Large shrub / small tree	-
<i>Strobilanthes perfoliatus</i>	Gurgi	Shrub	-
<i>Canthium didymum</i>		Middle sized evergreen	-
<i>Flacourtia latifolia</i>	Tambat	Shrub	-
<i>Piper hookeri</i>		Climbing shrub	-
<i>Cyclea burmanni</i>	Paryel	Climbing shrub	-
<i>Eleagnus latifolia</i>	Ambgul	Evergreen tall shrub	-
<i>Embelia vividiflora</i>		Large climber/Evergreen shrub	-
<i>Gnetum scandens</i>	Umbli	Evergreen climber	-
<i>Allophylus lobbe</i>	Tipani	Small tree shrub	-
<i>Glochidion hohenackeri</i>	Bhoma	Small tree	-
<i>Carisa carandus</i>	Karwanda	Shrub	-
<i>Careya arborea</i>	Kumbia	Deciduous tree	-
<i>Terminilia tomentosa</i>	Ain	Large tree	-
<i>Mangifera indica</i>	Mango	Large tree	-

ANNEXURE – VI

Threatened / Endangered Plants of Mahabaleshwar-Panchgani Region (as per the Red Data Book)

1. *Smithia agharkani*
2. *Ceropegia jainii*
3. *Ceropegia maccannii*
4. *Barleria gibsoniodes*
5. *Ceropegia mahabalei*
6. *Ceropegia noorjahjniae*
7. *Ceropegia rollae*
8. *Dipcadi ursulae*
9. *Ceropegia attenuata*
10. *Iphigenia magnifica*

ANNEXURE – VII

Plants in need of conservation measures

1. *Osmunda regalis*
2. *Ophioglossum* species
3. *Dipcadi montana*
4. *Delphinium dasycaulon*
5. *Evodia lunuankeda*
6. *Habenaria* – five species
7. *Dendrobium aquenulin*
8. *Dendrobium barbatulum*
9. *Aerides maculosm*
10. *Platenthera susanna*
11. *Copparis spinosa*
12. *Dolicos bracteatus*
13. *Exacum bicolour*
14. *Barleria bicolour*
15. *Barleria gibsonii*
16. *Hamkltonia suveolens*
17. *Isoetes sahyadrense*
18. *Aponogeton satarensis*
19. *Lobelia micotianaefolia*
20. *Usnea barbata*

ANNEXURE – VIII

Wild animals found in this area

A) Carnivores

- 1) Panther (*Panthera pardus*)
- 2) Wild Cat (*Felis chaus*)
- 3) Civet (*viverricula indica*)
- 4) Hyena (*Hyaena hyaena*)
- 5) Indian Pangolin (*Manis crassicaudata*)
- 6) Jackal (*Canis aureus*)
- 7) Fox (*Vulpes bengalensis*)
- 8) Wild Dog (*Cuon alpinus*)
- 9) Sloth bear (*Melursus ursinus*)
- 10) Indian Gray Mongoose (*Herpestes edwardsi*)

B) Herbivores

- 1) Gour (*Bos gaurus*)
- 2) Indian Gazelle (*Gazella gazella*)
- 3) Barking deer (*Muntiacus muntajak*)
- 4) Sambar (*Servus unicolor*)
- 5) Wild boar (*Sus scrofa*)
- 6) Indian Hare (*Lepus nigricollis*)

C) Rodents

- 1) Giant squirrel (*Ratufa indica*)
- 2) Plam squirrel (*Funambulus Pennanti*)
- 3) Porcupine (*Hystrix indica*)

D) Bats

- 1) Long-winged fruit eating bats (*Miniopterus schreiberzee*)

ANNEXURE – IX

AVIFAUNA OF MAHABALESHWAR

A variety of bird species are associated with the forests of Mahabaleshwar region. These birds are associated with specific environments. The *Sparrowhawk* is seen in winter and mid April and belongs to the Asiatic group of migratory birds. The Nilgiri Wood Pigeon is vocal during spring and in summer descends to the ground near streamlets. The Malabar *Whistling Thrush* is found near hill streams in forests after rains and then in the southern parts as streams dry up. Similarly, the *Lesser Yellow-nape* is observed in spring and summer. The Magpie Robin arrives in summer. The *Black Eagle* prefers valley slopes below high plateaux and is seen in May. While the *Shaheen Falcon* is seen over settlements and the *Common Kestrel* prefers scrub and secondary forests, barren and grassy plateaux and moist deciduous forests. As the name suggests, the *Stone Curlew* is seen in stony, undulating and scrub covered areas, and the *Rufous Backed Shrike* is seen in opened up forest, secondary forest and scrub areas.

The *Little Green Bee-eater* and *Streaked Fantail Warbler* prefer grasses and scrubs. *Blue Winged Parakeet* prefer moist deciduous and evergreen forests. Other birds found are *Green Imperial Pigeon*, *Migratory Japanese Buzzard*, *Pygmy Woodpecker*, *Yellow Browed Bulbul*, *Red Whiskered Bulbul* and *Black Bulbul*, *Yellow Backed Sunbird*, *Cuckoos*, *Rufous Turtle Doves*, *Brown Wood Owl*, *Verditer Flycatcher* and *Greyheaded Flycatcher*. The most dominant birds of this area are *Black Birds*, *Crested Bulbuls*, *Scimitar Babblers* and the *Jungle Babblers*. Among the other species of avi-fauna, which are on decline, a mention may be made of the *Gray Jungle Fowl*, the *Shama* and the *Bronze-winged Dove*. Similarly the *Great Pied Hornbill* is becoming rare primarily because of the loss of fully-grown tall trees necessary for its nesting. For example, a 100 feet tall tree of *Canarium strictum*, which was used for nesting by the Hornbill, was lost recently. Similarly, *Alpine swifts*, *Dusky crag martins*, *Red-rumped swallows*, *Malabar Whistling Thrush* frequent the Venna valley. Recently, the roosting site of the *Brown Wood Owl (Strix leptogrammica)* has been found near the Forest guesthouse.

ANNEXURE - X

Types of honey

Type	Colour of honey
Jamun	Dark Brown
Hirda	Whitish
Gela, Terda, Burambi, Ranperu	White
Karvi	Reddish
Pisa	Black
-Sunflower	Yellow

Source: Government Apiary, Mahabaleshwar, 1999.

ANNEXURE – XI

Changes suggested in the Maharashtra Felling of Trees (Regulation) Act, 1964

This Act regulates the felling of trees in non-urban non-forest areas of Maharashtra.

This Act is limited to only those 16 species of trees specified in the Schedule and hence only regulates their felling; other species need no permission. A perusal of the list shows that most of the species are those that are of economic, and not of environmental/ecological importance. As per the Act, this Schedule can be amended or added to by a simple notification in the Official Gazette.

As regards the species of trees that shall be brought under the purview of this Act, the species shall be based on the different bio-geographical zones/regions of Maharashtra and the Schedule contain the bio-geographical zones/regions and the species that are regulated there. In the interim the following species shall be added to the Schedule:

1. All *ficus* species
2. *Bombax ceiba*
3. *Erythrina indica*
4. *Bridelia retusa*
5. *Cassia fistula*
6. *Memecylon umbellatum*
7. Rattan
8. *Strobilanthus* (Karvi, Vayati)
9. *Entada pursaetha* (Garbi)
10. *Rauvolfia serpentina* (Serpagandha)
11. *Terminalia bellerica* (Behda)
12. *Sapindus laurifolius* (Ritha)
13. *Semecarpus anacardium* (Bibba)
14. *Caryato urense* (Toddy)
15. *Mappia foetida* (Narbya)
16. *Borassus flabellifer* (Shindi)
17. *Phoenise sylvestris*
18. *Butea monosperma* (Palas)
19. *Terminalia arjuna* (Arjun)
20. *Holoptelea integrifolia* (Valva)
21. *Alsfonia scholaris* (Satvin)
22. *Mimusops elengi* (Babul)
23. *Vateria indica* (Dhup)

The Act shall be amended so that no permission can be granted in areas that have been identified or known as environmentally/ecologically sensitive areas, "hot spots" of biodiversity, areas where endangered species are found, biosphere reserves, etc.

No Rules have been framed under this Act. Rules shall be framed for the procedure to be followed by the Collector in case a person aggrieved by the order of the Tree Officer appeals to him under Section 3(2), for the Tree Officer to follow while granting or refusing permission under Section 3(1B)(b), etc. The Rules made for the Collector and Tree Officer shall contain a provision for public notice and hearings.

A number of Administrative Orders have been issued by the Forest Department on the procedures to be followed under this Act. These shall be incorporated either in the Act or the Rules to be framed.

The other changes to the Act are as follows :

Section 2(e) : The definition of "to fell a tree" shall be as under

"to fell a tree" includes burning or cutting or lopping or in any way damaging or destroying a tree whether directly or indirectly;

The above definition was suggested by the Urban Development Department to be incorporated in the amendment to the Maharashtra (Urban Areas) Preservation of Trees Act, 1975.

Section 2(f) : The definition of "tree" shall be as under

"tree" means any perennial woody plant, whether in the seeding or sapling stage or fully grown stage, and includes shrubs whose branches spring from the ground level specified in the Schedule; and the State Government may, by notification in the Official Gazette, add to or modify the Schedule, after considering the necessity for the protection of any variety of trees

'any perennial woody plant, whether in the seeding or sapling stage or fully grown stage, and includes shrubs whose branches spring from the ground level' has been taken from the Maharashtra (Urban Areas) Preservation of Trees Act, 1975.

Section 2(g) : The definition of "urban area" shall be as under

"urban area" means a municipal corporation area for which a municipal corporation is constituted under the Bombay Corporation Act, 1888, the Bombay Provincial Municipal Corporations Act, 1949 or the City of Nagpur Corporation Act, 1948, or a municipal area for which a Municipal Council is constituted under the Maharashtra Municipalities Act, 1965, and includes a notified area for which a Special Planning Authority is constituted or appointed under section 40 of the Maharashtra Regional and Town Planning Act, 1966 or an area designated as the site for a new town for which a Development Authority is constituted under section 113 of the Maharashtra Regional and Town Planning Act, 1966;

The above definition was suggested by the Urban Development Department to be incorporated in the amendment to the Maharashtra (Urban Areas) Preservation of Trees Act, 1975.

Section 3(1A) : The word "wishes" shall be replaced by the word "proposes" so as to read "If any person proposes to fell a tree,". This would bring it at par with other Acts as also plug the loophole that a person may not "wish" to fell a tree but may "purpose" to do so and hence does apply for permission to fell it.

At the end after "in that behalf", the following shall be added

"The application shall, for each tree, be accompanied by the description of the tree, age, species, census number if any, and a site plan indicating the position of all the trees and the trees required to be felled."

Hence the amended section would read as follows :

"If any person proposes to fell a tree, he shall apply in writing to the Tree Officer empowered under sub-section (1) for permission in that behalf. The application shall be accompanied by the description of the tree, age, species, census number if any, and a site plan indicating the position of all the trees and the tree (s) proposed to be felled."

Section 3 (1B)(b) :

- (a) the phrase "may, after due enquiry," shall be replaced by "shall personally inspect the tree or trees after due enquiry,".
- (b) the phrase "either grant or refuse the permission," shall be replaced by "either grant or refuse the permission for reasons to be recorded in writing."
- (c) In the first proviso, which deals with cases where the Tree Officer cannot refuse permission, the phrases "or if it has silviculturally matured, or if it constitutes obstruction to traffic" shall be deleted.

Trees in areas that have been identified or known as ecologically sensitive areas, "hot spots" of biodiversity, areas where endangered species are found, biosphere reserves, etc. should not be permitted to be cut even if they are silviculturally mature.

The PWD is not known to be sensitive. They decide on an alignment and then want to cut all trees in that alignment. They do not take care to see whether the alignment can be changed so as to save trees. Removing this phrase will force them to think the alignment and will approach the Forest Department to cut only those trees that are absolutely essential for the road work.

If at all a need is felt to provide for these contingencies, the same may form part of the Rules that shall be framed under this Act.

- d) In the second proviso the words "any other species" shall be replaced by the words "any other local indigenous species." This is prevent planting of exotic species that are not local and indigenous to the area and thereby avoid any possible imbalance in the ecosystem.
- e) In the second proviso at the end after "ensuing planting season" add "and shall protect and rear it and in the event of its not surviving shall plant again and again till the tree is at least three years old". This is required so as to ensure that the tree(s) planted in place of those cut survive.

Section 3(1C) : This shall be amended so that where a permission to cut a tree is deemed to have been granted, it is also deemed that the applicant shall plant an equal number of trees.

A proviso to this section is needed wherein no permission is deemed to have been granted for areas identified or known as ecologically sensitive areas, "hot spots" of biodiversity, areas where endangered species are found, biosphere reserves, etc. Such areas can be notified in the Official Gazette by the State Government from time to time.

New Section 3(3) : This shall be as follows :

"Causing the felling or felling of each tree shall constitute a separate offence."

Section 3A(1) :

- (a) "to plant such trees or additional trees" shall be replaced by "to plant such trees or additional trees of local indigenous species"
- (b) "by planting such trees or additional trees" shall be replaced by "by planting such trees or additional trees of local indigenous species."
- (c) At the end after "ensuing planting season" add "and shall protect and rear it and in the event of its not surviving shall plant again and again till the tree is at least three years old".

New Section 3A(4) : This shall be as follows :

"It shall be the duty of the owner or occupier of the land who is required to plant a tree or trees under section 3(1B) or section 3A(1) to ensure that they grow properly and are well preserved and shall submit a six monthly report to the Tree Officer till each tree is three years old."

New Section 3A(5) : This shall be as follows :

"Whether the owner or occupier fails to comply with the condition in the second proviso of section 3(1B) or an order under section 3A(1) the Tree Officer shall, after giving a reasonable opportunity or such owner or occupier of making representation or without prejudice to any other action which may be taken against the defaulter under this Act take necessary action himself and recover the expenditure incurred therefore from the owner or occupier, as the case may be, after giving a notice of demand of the amount payable by him. If the amount is not paid within the time specified by the Tree Officer in the notice which shall not exceed three months, it shall be recovered along with interest at twenty four percent per annum and other incidental expenses, if any."

Section 4: The first part of the Section, viz.

"Any person who... .. deem fit to impose; and"

shall be replaced by

"Whoever causes and tree to be felled or fells any tree in contravention of the provisions of the Act or fails to comply with any order issued or condition imposed by the Tree Officer or obstructs any Revenue Officer, Forest Officer or Police Officer or any officer and servants subordinate to them in the discharge of their functions under this Act, shall, on conviction be punished with imprisonment for a term of not less than three months which may extend up to five years for each tree that is felled or for every offence and the person shall be punished also with a fine of not less than ten thousand Rupees which may extend up to fifty thousand Rupees."

Section 13 : This section shall be deleted. A person can cut a tree and later state that it was "for preventing damage to person or property or for abating nuisance". If a tree is likely to cause damage to person or property or becomes a nuisance, it does not generally do so overnight. There is generally sufficient time for a person to apply for permission to fell the tree. The procedure for emergency cases wherein a tree needs to be felled overnight may be taken care of either in the Rules or the phrase "or if it likely to cause damage to person or property" may be added in the first proviso to section 3(1B)(b) [which deals with cases wherein the Tree Officer cannot refuse permission].

If this section is to be retained, the phrase "or for abating any nuisance on one's own land" shall be deleted. The land owner shall seek permission to fell the tree. Also, in cases where the tree has been felled "for preventing damage to person or property," the same shall be intimated to the Tree Officer and trees planted as ordered by the Tree Officer.