DRAFT ZONAL MASTERPLAN FOR ECO- SENSITIVE ZONE OF SANJAY GANDHI NATIONAL PARK

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ABBREVIATIONS

BMC	:	Brihanmumbai Municipal Corporation
CRZ	:	Coastal Regulation Zone
DCPR 2034	:	Development Control and Promotion Regulations 2034
DP	:	Development Plan
DPR	:	Detailed Project Report
EFA		Ecologically Fragile Area
EIA	:	Environmental Impact Assessment
ELU	:	Existing Land Use
EPA	:	Environmental Protection Act 1986
ESZ	:	Eco-Sensitive Zone
FAR	:	Floor Area Ratio
FSI	:	Floor Space Index
GCP	:	Ground Control Point
GOM	:	Government of Maharashtra
HA	:	Hectare
HAC		Human-Animal Conflict
IIA		Immediate Impact Area
MBMC	:	Mira Bhayandar Municipal Corporation
MMR		Mumbai Metropolitan Region
MMRDA		Mumbai Metropolitan Region Development Authority
MR&TP	:	Maharashtra Regional & Town Planning Act 1966
MCDM	:	Multi-Criteria Decision Making
NIC		Nature Interpretation Centre
NDZ	:	No Development Zone
NWAP		National Wildlife Action Plan
PA		Protected Areas
SGNP	:	Sanjay Gandhi National Park
TMC	:	Thane Municipal Corporation
TUSPL	:	Tandon Urban Solutions Pvt Ltd.
UDCPR	:	Unified Development Control and Promotion Regulations
VVCMC	:	Vasai-Virar City Municipal Corporation
WII		Wildlife Institute of India

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1 SANJAY GANDHI NATIONAL PARK

1.1 Introduction

1.1.1 Overview of SGNP

Sanjay Gandhi National Park (SGNP), located in Greater Mumbai agglomeration, is a unique ecological treasure, renowned for its rich biodiversity despite significant anthropogenic and biotic pressures. Its distinct location has led to a "fenced island" scenario in its southern block, contributing to its ecological fragility. SGNP stands out as one of the few national parks situated within a metropolitan region in Asia and ranks among the most visited parks worldwide.

Serving as the "Green Lungs" of Mumbai, Thane and Palghar, SGNP plays a crucial role in maintaining environmental balance and supporting life. The Park safeguards the catchment areas of the Tulsi and Vihar reservoirs, which supply water to the cities. A major hub for nature and eco-tourism, it includes Krishnagiri Upvan, a popular tourist attraction in Borivali. The park's forests are predominantly dense and moist deciduous, providing a thriving habitat for diverse wildlife, including a remarkably high density of leopards—the region's only big cat species. SGNP represents unique and fragile ecosystem and it belongs to Malabar Coast of Western Ghats biogeographic zone. No other National Park exists within this bio-geographic zone except SGNP, hence, SGNP is unique.

1.1.2 Historical background and establishment

The Sanjay Gandhi National Park (SGNP) Division spans 106.95 sq. km, extending across Thane District and Mumbai Suburban District in Maharashtra. The Vasai Creek bisects the division into the north block (Nagla Block) and the south block (Main Block). Administratively, the division falls under the jurisdiction of the Additional Principal Chief Conservator of Forests (Wildlife) West Mumbai and is managed by the Chief Conservator of Forests & Director, SGNP. The SGNP division is headed by the Conservator of Forests and Director. There are two Deputy Directors under the Conservator of Forests and Director: Deputy Director (North) in Yeur and Deputy Director (South) in Borivali, who oversee their respective areas.

The division has been formed through the amalgamation of forests under various ownerships, comprising Reserved Forests (RF), Protected Forests (PF), and Unclassified Forests (UCF). The Reserved Forests can be broadly classified into two categories. The first category includes the old Reserved Forests of Thane, municipal forests within the catchment areas of Tulsi and Vihar Lakes, and private lands acquired under the Land Acquisition Act of 1894. The second category consists of private forests acquired under the Maharashtra Private Forests Acquisition Act of 1975.

SGNP was officially declared a National Park through Maharashtra Government Resolution No. WLP/1094/OR 177/F-1 dated 16.01.1996 covering 86.96 sq. km.

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Table 1.1 Table showing major events of SGNP

Sr. No.	Year	Events
1	1950	The declaration of Krishnagiri National Park under the Mumbai National Park Act, 1950, involved the transfer of this area to the Department of Parks and Gardens, which encompassed an expanse of 19.20 sq are kilometers.
2	1960	The jurisdiction of the Krishnagiri National Park was transferred to the Forest Department.
3	1968	A high-level committee, led by the•Chief Minister of the Maharashtra State, recommended the establishment of Borivali National Park, encompassing an approximate area of 68.27 square kilometers.
4	1969	Forest exploitation came to a halt, and a forest sub- division was established with the responsibility of supervising the wildlife management of this park.
5	1972	The sub-division was elevated to the status of a Forest Division.
6	1976	The state government declared its intention to establish a National Park spanning an area of 68.977 square kilometers in the Mumbai Suburban District and Thane District.
7	1977	The management of the National Park was handed over to the Forest Development Corporation of Maharashtra Ltd (FDCM).
8	1981	The name of Borivali National Park was changed to Sanjay Gandhi National Park.
9	1983	The state government declared its intention to establish an area of 86.965 square kilometers as SGNP, encompassing the previously mentioned area.
10	1988	The management of the Sanjay Gandhi National Park was returned to the Forest Department.
11	1996	The final notification was issued, officially designating an area of 86. 96 square kilometers as Sanjay Gandhi National Park.

Source: Forest Management Plan, SGNP, 2024-25 to 2033-34

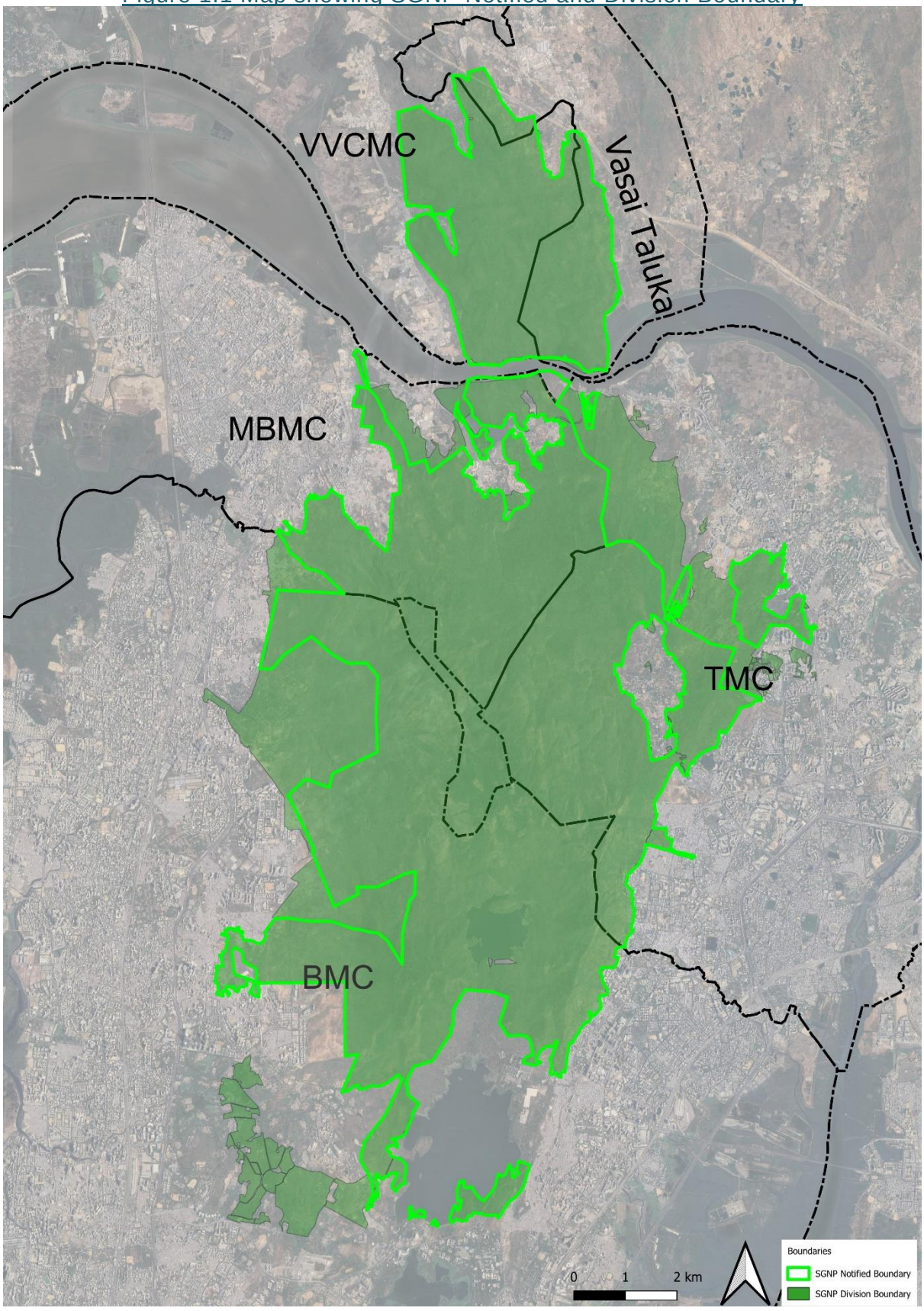
SGNP comprises three territorial ranges such as Yeur Range Tulsi Range Krishnagiri Upvan Range (smallest and outside the notified SGNP area). These ranges are further divided into 9 rounds and 25 beats. The division also includes 43 padas (tribal settlements)—28 in Mumbai Suburban District and 15 in Thane District.

Table 1.2 Table showing area details of SGNP Division

Sr. No.	Range	Within Sanjay Gandhi National Park (Ha.)	Outside Sanjay Gandhi National Park (Ha.)	Total (Ha.)
	Total	8696.579	1,998.421	10695.000

Source: Forest Management Plan, SGNP, 2024-25 to 2033-34

Figure 1.1 Map showing SGNP Notified and Division Boundary



Source: SGNP

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1.1.3 Significance of SGNP

Sanjay Gandhi National Park (SGNP) serves as a vital ecological and cultural asset within the densely urbanized landscape of Mumbai, Thane and Palghar. It holds immense biological, archaeological, environmental, recreational, and educational significance, with its impact extending from local to international levels.

1.1.3.1 Environmental Value

SGNP acts as the "Green Lungs" of Mumbai, Thane and Palghar, mitigating pollution and regulating temperature. It protects the catchments of Vihar and Tulsi Lakes, which supply high-quality water to both cities. These lakes, which have never dried up, provide a crucial water security buffer, especially during delayed monsoons. The park's dense vegetation absorbs pollutants, significantly improving air quality, and helps regulate urban temperatures by maintaining an ambient temperature 3-5°C lower than surrounding areas. Additionally, SGNP plays a key role in carbon sequestration, aiding climate change mitigation. Four major rivers of Mumbai—Mithi, Poinsar, Oshiwara, and Dahisar—originate from SGNP. *(FMP, SGNP, 2024-25 to 2033-34)*

1.1.3.2 Biological Value

SGNP's vegetation ranges from littoral forests to subtropical hill forests, supporting approximately 550 faunal species. The Park is home to a wide variety of endangered flora and fauna, including leopards, 300 bird species, 43 mammal species, 45 reptile species, 12 amphibian species, around 150 butterfly species and thousands of invertebrates. It also houses rare sightings, such as the tail-less whip scorpion and the orange-breasted green pigeon. Dominant tree species include kadamba, teak, karanj, acacia, ziziphus, and flame of the forest. Notably, the Karvi plant, which blooms once every seven years, adds to the park's botanical significance. *(FMP, SGNP, 2024-25 to 2033-34)*

1.1.3.3 Archaeological Value

The Park is home to the ancient Kanheri Caves, dating from the 1st century BCE to the 9th century CE. These 109 rock-cut caves were once part of a Buddhist monastic settlement along an ancient trade route. The caves include small chambers ("Vihars") used as monastic dwellings and larger prayer halls ("Chaityas"), showcasing intricate carvings and historical significance.

1.1.3.4 Cultural Value

Sanjay Gandhi National Park (SGNP) possesses ecological, intrinsic, and spiritual significance, offering recreational benefits that can generate revenue without damaging its natural environment, provided its carrying capacity is carefully managed. People often value the park for its mere existence, appreciating its continued ecological function even without direct use—an idea known as existence value. A key attraction within SGNP is the Kanheri Caves, one of India's oldest and largest Buddhist cave complexes, reflecting the development of Buddhist architecture and sects from the 2nd to the 11th century CE. The name "Borivali" stems from "Viharavali," meaning a row of viharas, while "Kanheri" is derived from "Kanhagiri" or "Krishnagiri," meaning dark hills. The cave complex includes over 109 chaityas and viharas carved into terraces along a seasonal stream, showcasing a blend of Hinayana and Mahayana art and architecture.

1.1.3.5 Recreational and Educational Value

Sanjay Gandhi National Park (SGNP) stands out as a green sanctuary surrounded by densely populated urban areas. Attracting nearly two million visitors annually, the park offers a unique chance to experience its rich natural and cultural heritage. The Park offers unique opportunities for recreation and education, with its Nature Interpretation Centre (NIC) serving as a hub for biodiversity awareness. Regularly conducted nature trails—such as the Shilonda, Kanheri, and Bamboo Hut trails—provide visitors with immersive experiences of the park's flora and fauna. Streams along these trails attract naturalists and researchers eager to explore its diverse ecosystems. The park's seasonal transformations further enhance its scenic beauty, making it a dynamic destination for eco-tourism. These visits help people understand the vital importance of biodiversity and the need to conserve it. The park's nature trails serve as powerful tools for educating the public, highlighting the essential role forests play in supporting life and ensuring human survival.

1.1.3.6 Anticipated Threats to Values

- Deforestation and Fragmentation: Human activities have fragmented SGNP forests, mainly due to encroachments and infrastructure like roads and buildings. This reduces habitat size, isolates wildlife populations, and alters microclimates. The loss of natural corridors restricts species movement, limiting genetic exchange and increasing the risk of inbreeding and local extinctions.
- Edge effect: The forest edge undergoes physical and biological changes, known as the edge effect. These include stronger winds, more light and temperature fluctuations, and drier conditions. Biologically, there's an increase in invasive species, generalist wildlife, predation, parasitism, and shifts in processes like nutrient cycling. The impact varies by forest type, species, and time.
- Hydrology: Urbanization in the forest-urban interface alters water flow by increasing impervious surfaces like roads and rooftops, which reduce infiltration and increase runoff and flooding. It also involves draining wetlands, channelizing streams, and introducing more sediments, nutrients, and pollutants into water bodies. Construction and erosion further degrade stream beds and banks. Development often occurs in stream headwaters—critical habitats for sensitive, endemic species—disrupting them through vegetation loss, higher temperatures, and poorer water quality.
- Nutrient cycling: Urban areas are a mix of population densities, buildings, and surface types, with native forests often embedded within them. Even without direct disturbance, nearby urbanization can impact forest ecosystems over time. More research is needed to understand how much urbanization triggers changes in species, structure, and ecological processes, and how long these effects take to appear.
- Biodiversity: Urbanization reduces native species and increases non-native ones by altering habitats and making it hard for some species to adapt. Human activity drives these changes, especially with higher population density, disrupting ecosystems and raising the risk of zoonotic diseases that threaten both people and biodiversity.

- Atmospheric effect: Key air pollutants affecting forests include nitrogen oxides, sulfur oxides, and ground-level ozone. Though naturally occurring, human activities raise their levels, which can harm plant tissues, disrupt ecosystems, and increase forest vulnerability to other stresses.
- Forest Health: A healthy ecosystem is stable, resilient, and self-sustaining. Urbanization disrupts this balance through fragmentation, pollution, and species loss, leading to 'distress syndrome.' Over time, urban forests shift in composition, often becoming mixes of native and non-native species, with altered ecosystem services.
- Natural disasters and disturbances: Urbanization, like natural disturbances, alters ecosystem structure and composition—but with longer-lasting effects. It reduces native habitats and increases human-made features, leading to less diverse landscapes. *(FMP, SGNP, 2024-25 to 2033-34)*

1.2 Biodiversity and Ecology

1.2.1 Flora

The Sanjay Gandhi National Park (SGNP) hosts an exceptionally diverse range of flora, including rare, endemic, and ecologically significant species. One such species is Saraca asoca (Sita Ashok), which is both rare and endemic to the region. It is prominently found in a 75-hectare patch near the Kanheri Caves, popularly known as 'Ashok Van.' This tree blooms between March and May, and its pods serve as an important food source for herbivores like monkeys and langurs. Another noteworthy species is Garcinia indica (Kokam), an evergreen tree that thrives at higher elevations near Yeur and above the Kanheri Caves. Its fruits are consumed by wildlife and possess medicinal properties, particularly for treating digestive ailments. Additionally, two species of white orchids from the genera Platanthera and Habernaria are found at the park's highest elevations and bloom in September.

SGNP's forests are primarily classified under the Champion & Seth system into four distinct types- Moist Teak-Bearing Forests (3B/C1), Southern Moist Mixed Deciduous Forests (3B/C2), Mangrove Scrubs (4B/TS1), and Western Sub-Tropical Hill Forests (8A/C2). The Moist Teak-Bearing Forests occupy about 3–5% of the park's area and are concentrated in the Yeur and Ghodbander regions. These forests thrive in favorable soil conditions and exhibit a forest density ranging from 0.4 to 0.7. Dominant tree species include Tectona grandis (Teak), along with Garuga pinnata (Kakad), Mangifera indica (Amba), Schleichera oleosa (Koshimb), and Syzygium cumini (Jambul). Understory vegetation includes shrubs like Carissa carandas (Karvand) and Adhatoda vasica (Adulsa), climbers such as Abrus precatorius (Gunj), and bamboo species like Dendrocalamus strictus (Manvel) and Bambusa arundinacea (Katang). A variety of grasses, including Cynodon dactylon (Harali) and Desmotachya bipinnata (Darbha), are also present.

The most widespread forest type in SGNP is the Southern Moist Mixed Deciduous Forest (3B/C2), characterized by tree density ranging from 0.4 to 0.7. These forests feature deep, loamy, humus-rich soil and are rich in both deciduous and semi-evergreen species. While teak occurs sparingly, dominant vegetation includes Mangifera indica (Mango), Ixora brachiata (Lokhandi), Schleichera oleosa (Koshimb),

and Saraca asoca (Ashok), especially along stream courses in areas like Kanheri, Chene, and Krishnagiri Upvan. The tree composition also includes species from genera such as Albizzia, Terminalia, Holarrhena, Firmiana, Dalbergia, Ficus, Madhuca, Caraya, and Butea. Bamboo species such as Dendrocalamus strictus and Bambusa arundinacea are common in dense clusters.

The Mangrove Scrubs (4B/TS1) are mainly located along the Bassein Creek, which traverses the SGNP and spans 41 kilometers in length. Although mangroves once thrived extensively, today only about 23% of the creek area—approximately 2000 hectares—is covered by mangroves, with SGNP encompassing just 40 hectares. The dominant mangrove species is Avicennia marina, while species like Bruguiera gymnorhiza and Lumnitzera racemosa have nearly vanished. Other mangrove species such as Sonneratia alba and Rhizophora apiculata are also absent. The creek ecosystem supports marine algae such as Enteromorpha clathrata and Cladoglozza epureurii, which contribute to its ecological diversity.

The Western Sub-Tropical Hill Forests (8A/C2) are found in small patches at higher elevations, particularly on low-lying hills around Kanheri and Yeur. These forests have a tree density of about 0.6 and are classified as semi-evergreen. Bamboo is notably absent from this forest type. Key tree species include Mangifera indica (Mango), Garcinia indica (Kokam), Syzygium cumini (Jambul), Calophyllum inophyllum (Undi), Ixora brachiata (Lokhandi), Murraya paniculata (Pandari), and Pongamia pinnata (Karanj). Other notable species observed across SGNP include Tectona grandis, Terminalia tomentosa, Acacia catechu, Adina cordifolia, Mitragyna parviflora, Pterocarpus marsupium, Holarrhena antidysenterica, Butea monosperma, and Diospyros melanoxylon. *(FMP, SGNP, 2024-25 to 2033-34)*

1.2.2 Fauna

Despite its close proximity to a bustling metropolis of over 20 million people, Sanjay Gandhi National Park (SGNP) boasts remarkable biodiversity. The Park is particularly well-known for its population of leopards, which draws considerable attention. It also shelters striking insect species like the atlas and moon moths, known for their large size and vivid appearance. The forest floor is alive with giant tarantulas, and several species of trapdoor spiders construct burrows with cork-like lids made of soil, plant material, and silk. In the trees, pagoda ants and weaver ants hunt for invertebrate prey, while harvester ants search the ground for seeds. Termites also play an essential role in the park's rich and diverse ecosystem.

Fauna under the heads of mammals are categorised into 7 orders, 17 families and 43 species. Likewise, reptiles are categorised into 3 orders, 14 families and 38 species. Amphibians are categorised into 1 order, 4 families and 9 species and birds are categorized into 18 orders, 46 families and 250 species. *(FMP, SGNP, 2024-25 to 2033-34)*

The Sanjay Gandhi National Park (SGNP) has historically been home to a diverse range of wildlife. However, the rich faunal diversity had suffered considerable depletion due to extensive encroachments. Over the past 40 years, concerted conservation efforts and the removal of some encroachments have led to a resurgence in wildlife populations, as reflected in recent surveys. The vertebrate

fauna of SGNP includes 43 species of mammals, 250 species of birds—including both migratory and resident species—45 species of reptiles, and 12 species of amphibians.

SGNP harbours an incredible diversity of invertebrates, including various species of grasshoppers, spiders, bugs, mosquitoes, beetles, termites, mantises, bees, hornets, wasps, cockroaches, cicadas, aphids, moths, butterflies, dragonflies, and damselflies. The Park supports nearly 150 butterfly species, with the optimal observation period spanning from September to January. Of particular note, the Atlas moth, one of the largest moth species, was observed in the park in September 1999, marking a significant discovery. *(FMP, SGNP, 2024-25 to 2033-34)*

1.2.2.1 Mammals

The Park provides a habitat for a wide range of herbivores, carnivores, and omnivores. The 43 mammal species found in the park belong to 8 natural orders and 17 families, with 8 species categorized as "Endangered" under Schedule I and Part II of Schedule II of the Wildlife (Protection) Act, 1972 namely Leopard (Leoparda pardus), Rusty-Spotted Cat (Felis rubiginosa), Jungle Cat (Felis chaus), Small Indian Civet (Viverricula indica), Asian Palm Civet (Pardoxurus hermaphroditus), Jackal (Canis aureus), Sambar (Rusa unicolor), Mouse Deer (Tragulus meminna)

Sanjay Gandhi National Park (SGNP) hosts several carnivorous species from four families under the order Carnivora.

Carnivovers such as Leopard (Leoparda pardus) and Jungle cats, Rusty spotted cat (Prionailurus ru biginosus) under the family of Felidae, Jackal (Canis aureus) under the family of Canidae, Small Indian civet (Viverricula indica), Indian Grey mongoose (Hepestes edwardsi) under the family of Viverridae and Striped Hyena (Hyaena hyaena) under the family of Hyaenidae are observed within SGNP.

Large herbivores in SGNP include spotted deer, sambar, mouse deer, and wild boars. Spotted deer are commonly found near Tulsi and Vihar Lakes and in the KUB tourism zone. Sambars are widespread in Shilonda, Yeur, and Chene forests. Mouse deer are concentrated around Tulsi and Vihar Lakes and the Kanheri Caves, while wild boars are frequent in Shilonda and near the lakes. Within the SGNP region, the large herbivores are classified into three families under the Artiodactyla order.

Wild boar (Sus scrofa) under the family of Suidae, mouse deer (Tragulus meminna) under the family of Tragulidae and spotted deer (Axix axis), sambar (Ceruus unicolor) and barking deer (Muntiacus muntjac) under the family of Cervidae.

Small herbivores in SGNP remain under-studied. However, the black-naped hare is commonly found in valleys, while the porcupine is frequently sighted in the Kanheri Caves region. Four horned Antelope is very commonly observed in the park area. Blacknaped Hare, Wild Cat (Felis chaus), Jackal (Canis aureus) and Porcupine (Hystrix indica) is also observed. *(FMP, SGNP, 2024-25 to 2033-34)*

1.2.2.2 Primates & Bats

Three primate species inhabit the park: the bonnet macaque, rhesus macaque, and Gray langur coexist. Among them, the Bonnet macaque exhibits a common presence across various parts of the area, contributing to the diverse primate population in this habitat. Region supports seven species of bats. *(FMP, SGNP, 2024-25 to 2033-34)*

1.2.2.3 Avifauna

The avifauna of SGNP is among its most striking wildlife features, with approximately 234 species recorded, spanning 18 different orders and 47 families. The period between December and February offers the best opportunities for birdwatching. SGNP is home to five endangered bird species: peafowl (Pavo cristatus), osprey (Pandion haliaetus), and large falcons (Falco peregrinus, Falco biarmicus, and Falco chicquera). Peacock (Pavo cristatus), Lesser Grebe, Purple Heron (Ardea purpurea), Smaller Egret, Lesser Whistling Teal, Pariah Kite, Bulbul are observed in the park.

Tickell's Flowerpecker, many species of Sunbirds, White-bellied Sea Eagle, Paradise Flycatcher, Trogon, many species of Kingfishers, Woodpeckers, Brown-headed Barbet, Parakeets, Racket-tailed Drongo, Tickell's Blue Flycatcher, Malabar Whistling Thrush, Puff-throated babbler are found within the park.

Common waterbirds in the park include cormorants, migratory ducks such as the common teal, garganey, and red-headed pochard, as well as two species of jacanas—the pheasant-tailed jacana and the bronze-winged jacana. The mangrove swamps attract plovers, sandpipers, gulls, and terns. Nocturnal birds recorded in the park include the barn owl, great horned owl, barred jungle owlet, and spotted owlet. Parakeet species such as the rose-ringed parakeet and blossom-headed parakeet are common breeders within SGNP. Additionally, the park provides habitat for white-breasted and common kingfishers, as well as several woodpecker species, including the rare heart-spotted woodpecker. Blue Mormon, Blue Oak leaf, Jezebels and Large Yellow and White Orange tips, Monarchs, Egg fly, Sailors are some butterflies that are found here. *(FMP, SGNP, 2024-25 to 2033-34)*

1.2.2.4 Reptiles

SGNP is home to 38 reptile species across three orders and 14 families, with seven species listed as "Endangered" under Schedule I and Part II of Schedule II of the Wildlife (Protection) Act, 1972. Three tortoise species occur within the park, along with 11 species of lizards, including the chameleon and monitor lizard. The Park also harbors 23 snake species, seven of which are endangered. Indian Cobra and Viper are observed in the park. Crocodiles in Tulsi Lake, Pythons, Russell's viper, Bamboo-pit Viper and the extremely rare Ceylonese Cat Snake are found within the park. Anthropods like Giant wood spiders, Signature spiders, Black wood spider are found in the park.

List of endangered reptiles in SGNP includes Indian Marsh Crocodile (Crocodilus palustris), Indian Rock Python (Python molurus), Dhaman or Rat snake (Ptyas mucosa), Indian Cobra (Naja naja), Russel's Viper (Daboia russelii), Checkered keelback (Faw/ea piscator), Bengal monitor (Varanus bengalensis). *(FMP, SGNP, 2024-25 to 2033-34)*

1.2.2.5 Amphibians

Within the Kanheri Caves, which are characterized by perennial pools of water, a diverse array of frogs and toads thrives. Commonly observed species in this habitat include the Indian tree frog (Polypedates maculatus), Indian bullfrog (Hoplobatrachus tigerinus), Asian common toad (Duttaphrynus melanostictus), and the relatively less common Mountain dot frog (Ramanella montana). In the Tulsi Tunnel, sightings of Fungoid frogs (Hylarana malabarica) have been reported. The cisterns surrounding the Kanheri Caves also serve as important microhabitats, supporting unique species such as the Indian Five-fingered Frog (Euphlyctis hexadactylus). *(FMP, SGNP, 2024-25 to 2033-34)*

1.2.2.6 Fish

SGNP's water bodies, including Bassein Creek, support a rich diversity of fish species. The monsoon season witnesses an influx of marine fish as deep-sea fishing is temporarily suspended, leading to their migration toward the shore. In total, 25 marine fish species and 18 freshwater fish species have been documented within the park.

Table 1.3: Population Estimation of Major Wild Animals

Year	Pan-ther	Sam-bar	Chital	Barking Deer	Mon-key & Langoor	Wild Boar	Mungoo se	Jungle Hen	Pea-cock	Hare
1994	41	35	119	23	-	24	-	-	-	-
1995	39	33	139	21	-	22	-	-	-	-
1996	39	29	131	41	-	43	-	-	-	-
1997	36	51	142	41	-	114	-	-	-	-
1998	40	24	232	24	-	61	-	-	-	-
1999	41	256	9	5	-	22	-	-	-	-
2000	38	92	55	15	295	13	19	25	7	47
2001	42	29	126	8	185	30	7	51	24	30
2002	42	23	162	28	441	28	18	48	129	18
2003	38	79	167	25	589	19	36	150	133	27
2004	33	23	273	11	819	26	26	94	72	25
2005	25	29	272	16	745	12	23	87	88	13
2006	23	23	310	18	597	29	9	29	20	25
2007	20	32	347	14	743	22	9	27	20	17
2008	24	24	353	9	660	24	8	39	25	8
2009	23	27	390	11	715	26	14	59	28	21
2010	Census was not carried out									
2011	21	37	494	12	835	24	19	106	35	07

Source: Forest Management Plan, SGNP, 2013-14 to 2022-23

1.3 Governance and Conservation Efforts

In the past, wildlife conservation was not given due importance, leading to indiscriminate hunting and a significant decline in large wild animal populations. It was believed that tigers had become extinct in SGNP by the late 1930s, however, in 2004, the discovery of tiger pug marks and scats in the Nagla Block reignited interest in the park's wildlife, drawing attention from conservationists across India. Similarly, the marsh crocodile was once common in and around the area, with Tulsi and Vihar Lakes serving as breeding sites. However, since 1950, their population has declined significantly. While the old Reserved Forests in this division were historically managed under scientific forestry principles, wildlife conservation was only incorporated into management planning in the later years. Over the past four

decades, there has been a positive shift towards prioritizing wildlife conservation, marking a significant step forward in the region's ecological stewardship.

1.3.1 Past Conservation initiatives

1.3.1.1 Encroachments

Since the SGNP Division lies within the districts of Mumbai, Palghar and Thane, it is under constant threat from human-induced pressures. The most harmful among these are encroachments for housing and agriculture, particularly in lands acquired under the Maharashtra Private Forest (Acquisition) Act of 1975 and similar laws. Many people living near the park increasingly encroaches on open and unprotected areas within SGNP to build unauthorized dwellings. This intrusion began in the early 1970s and gradually intensified, with three major phases: the first from the 1970s to 1985, the second from 1985 to 1994, and the most severe starting in November 1994. By that time, around 200 hectares of Reserved Forest land had been taken over by approximately 61,000 families, causing extensive environmental degradation through deforestation, land clearing, and fires.

In response, the Bombay Environmental Action Group filed Writ Petition No. 305/1995 in the Bombay High Court, urging the State Government to take action to protect the park's biodiversity. On 7th May 1997, the Court issued a landmark judgment directing the immediate removal of all encroachments from SGNP. It also ruled that eligible encroachers must be relocated outside the park within 18 months under the government's rehabilitation policy, after which their structures should be demolished. Those not qualifying for rehabilitation faced immediate demolition. Several additional court orders followed to ensure effective implementation of the judgment.

Present Status of encroachments includes: In 1997, approximately 61,000 encroachments were recorded on forest land within the SGNP Division, with about 33,000 families identified as eligible for rehabilitation, having settled there on or before January 1, 1995. However, only 25,972 individuals submitted the required documentation to prove eligibility. Among them, 12,849 paid the court-mandated contribution of ₹7,000 between 1999 and 2003, and after thorough verification, 11,658 were confirmed eligible for relocation. Initially, these families were to be resettled in Shirdon, Kalyan, but the plan was met with resistance due to concerns over job loss and disruption to children's education. As a result, the government chose to relocate the families within Mumbai, at Chandivali, Powai, under a slum rehabilitation scheme. The Slum Rehabilitation Authority (SRA) appointed M/s Sumer Corporation for Phase-I construction, and 11,359 families were successfully relocated beginning in 2007. As of March 2023, 299 families still await resettlement due to a shortage of housing units. For Phase-II, the High Court extended the deadline for paying the ₹7,000 contribution until 2008, during which 16,651 payments were made. Of these, 13,486 were deemed eligible. M/s DB Realty was appointed for Phase-II construction at Chandivali, but work was halted in 2015 after aviation authorities objected to building height violations in the airport funnel zone, leading to the suspension of further relocation efforts. To address this setback, a High-Power Committee was established in 2018 to explore alternative rehabilitation solutions. It proposed using 90 acres of land in Marol-Maroshi, with 43 acres allocated for tribal rehabilitation and 47 acres for eligible encroachers. MHADA was given the responsibility for development using

Transferable Development Rights (TDR), but despite six tender calls, no bids were received. Later, in a meeting on September 30, 2021, chaired by the Chief Minister, a new committee was formed to identify alternate land parcels for rehabilitation. Most recently, on August 11, 2023, a high-level Legislative Committee chaired by the hon'ble Forest minister was established to accelerate the rehabilitation process. *(FMP, SGNP, 2024-25 to 2033-34)*

1.3.1.2 Protection from Fire

Forest fires are a serious threat in the area, with most incidents occurring between March and May, largely due to human activity. To reduce fire risks, preventive steps are taken, including the creation of fire lines by February 15 each year. An annual fire protection strategy is prepared, and dedicated fire-fighting teams are deployed from December through June. Fire watchers are tasked with patrolling the area, identifying, and suppressing fires.

Key causes of forest fires include:
a) Tribal communities burning waste to clear small patches of agricultural land.
b) Unauthorized access to the park leading to accidental fires.
c) Illegal activities like bootlegging and unlicensed liquor production near water sources.
Each year, a fire management plan is developed and carried out based on the funds available. During fire season, fire lines are systematically cut, burned, and maintained as part of preventive action. *(FMP, SGNP, 2024-25 to 2033-34)*

1.3.1.3 Waste Management

To combat the growing issue of plastic pollution, the Afroz Shah Foundation launched a citizen science initiative in 2019–20. Initially limited in scope, the project gradually expanded to cover all tribal settlements within SGNP. Its primary aim is to raise awareness among residents about minimizing plastic use, promoting source-level segregation, and ensuring organized collection. Volunteers routinely gather plastic waste from specified areas, including tourist spots, while maintaining detailed records of their efforts. The initiative has significantly curbed plastic pollution in the park, supported by SGNP authorities' measures to control plastic entry at the main gate.

1.4 Conservation challenges to SGNP

The Sanjay Gandhi National Park (SGNP) faces several conservation challenges that led to the constitution of an Eco-Sensitive Zone (ESZ) around it. Some of the key challenges include:

- Unregulated Urbanization & Encroachments: Unregulated urbanization and encroachments around SGNP fragment habitats, reduce biodiversity, and increase human-wildlife conflict. Expanding settlements and infrastructure degrade ecosystems, disrupt wildlife, and strain vital services like water recharge and air purification. Weak enforcement and legal hurdles further hamper conservation efforts.
- Human-Wildlife Conflict: Human-wildlife conflict in SGNP arises as urban areas encroach on forest edges, leading to frequent leopard sightings in nearby settlements. Habitat loss and poor waste management attract prey animals, drawing predators closer to people. This creates safety risks and threatens wildlife, requiring effective mitigation and community awareness.

- Polluting & Waste Dumping: Pollution and waste dumping in SGNP, mainly from nearby settlements and urban areas, degrade soil and water quality, harm wildlife, and disrupt ecosystems. Poor waste management and rising air and noise pollution further threaten the park's biodiversity and ecological balance.
- Prohibited Activities & Deforestation: Prohibited activities like illegal tree cutting, grazing, hunting, and land clearing pose serious threats to SGNP, leading to deforestation and habitat loss. These actions degrade biodiversity, disturb wildlife, and weaken the forest's ability to provide vital ecological services. Despite protections, limited monitoring and enforcement make controlling such activities difficult.

1.5 Forest Management Plan

The Sanjay Gandhi National Park (SGNP) is being managed under a structured conservation strategy, with the latest Wildlife Management Plan implementing a zonation approach to enhance ecological protection and sustainable use. The Park is being divided into four management zones—Core Zone, Eco-Tourism Zone, Eco-Restoration Zone, and Administrative Zone—each with tailored conservation and management strategies.

a. The Core Zone (6,801.229 hectares) This zone forms the core of Sanjay Gandhi National Park, covering the catchment areas of Tulsi and Vihar lakes along with several rivers and streams. It is home to vital species and includes a mangrove ecosystem near Bassein Creek. Predominantly made up of untouched Reserved Forests, the core zone is rich in biodiversity. These areas are strictly protected, with limited human activity, to ensure the preservation of wildlife.

Table 1.4: Details of areas included in Core Zone

Sr.no	Range	Reserved Forest	Protected Forest	Unclassed Forest	Total (Ha)
1	Tulsi	1577.324	0.00	793.023	2370.347
2	Yeur	3500.865	0.00	930.017	4430.882
	Total	5078.189	0.00	1723.04	6801.229

Source: Forest Management Plan, SGNP, 2024-25 to 2033-34

Activities like Habitat improvement works, watershed development works, effective forest protection measures, wildlife monitoring and research and selected ecological study tours are proposed in the core zone.

b. The Eco-Tourism Zone (1026.347 hectares): This zone includes regions with high potential for ecotourism and lies adjacent to the core zone, where natural preservation coexists with sustainable human activities like ecotourism, recreation, and initiatives supporting health and well-being. It also houses the park's administrative block.

Activities like Habitat improvement works, watershed development works, effective forest protection measures, wildlife monitoring and research, ecotourism and recreation activities, mini-zoo and conservation breeding activities, encroachment removal and rehabilitation and activities related to promoting human health and wellbeing are proposed in the ecotourism zone.

Table 1.5: Details of area inclued in Ecotourism Zone

Sr.no	Range	Reserved Forest	Protected Forest	Unclassed Forest	Total (Ha)
1	KUB	7.249	5.598	575.700	588.547
2	Tulsi	106.000	0.00	100.500	206.500
3	Yeur	131.000	0.00	100.300	231.300
	Total	244.249	5.598	776.500	1026.347

Source: Forest Management Plan, SGNP, 2024-25 to 2033-34

c. The Eco-Restoration Zone (2,867.464 hectares) This zone covers areas affected by human activity or under restoration, including forest edges near settlements, cleared encroachments, Adivasi villages, old quarries, degraded forests, and disputed lands. Its main goal is to restore damaged ecosystems.

Table 1.6: Details of area included in Eco-restoration Zone

Sr.no	Range	Reserved Forest	Protected Forest	Acquired Private Forest	Unclassed Forest	Total (Ha)
1	KUB	0.000	0.000	647.416	647.340	1294.756
2	Tulsi	310.987	0.000	0.000	0.000	310.987
3	Yeur	368.404	8.519	884.798	0.000	1261.721
	Total	679.391	8.519	1532.214	647.340	2867.464

Source: Forest Management Plan, SGNP, 2024-25 to 2033-34

Activities like Habitat restoration works, watershed development works, effective forest protection measures, wildlife monitoring and research, ecotourism and recreation activities, encroachment removal and rehabilitation and activities related to promoting human health and wellbeing are proposed in the eco restoration zone.

Furthermore, micro-watersheds are being delineated and prioritized for soil and moisture conservation interventions to sustain the park's ecological balance. The forest department is implementing measures to enhance patrolling, fire prevention, and habitat protection, ensuring the long-term conservation of SGNP's biodiversity and landscape integrity. *(FMP, SGNP, 2024-25 to 2033-34)*

1.6 Theme Plans

To ensure the sustain ability of this ecosystem, the following key themes have been recognized in the Forest Management Plan 2024-25 to 2033-34.

- Forest Protection: Forest protection focuses on enhancing ecosystem health by improving species composition, age balance, and structural vitality. This involves updating and aligning land records, timely demarcation of forest boundaries, and strict control of encroachments. Key measures include reducing forest fires, managing pests and diseases, regulating grazing to match the land's carrying capacity, and minimizing human interference like illegal logging, hunting, and overgrazing through strong enforcement and public awareness.

- Wildlife Management: Wildlife management aims to prevent species loss by balancing the needs of wildlife and human communities based on ecological principles. It requires a deep understanding of population dynamics, food chains, and interspecies interactions that naturally regulate animal numbers. Effective management relies on maintaining wildlife populations within ecological carrying capacity—the limit a habitat can support sustainably—and also considers social carrying capacity, which reflects the level of wildlife presence acceptable to local communities. Integrating both ecological and social factors ensures sustainable, balanced coexistence that meets environmental, economic, and social goals.
- Watershed Management: In forested areas, watershed development aims to slow and control surface runoff by guiding water flow downward through site-specific interventions using local materials. These efforts follow the "ridge-to-valley" principle, starting from the upper catchment to prevent erosion and reduce siltation in lower water harvesting structures. Beginning work at the valley without treating the ridge leads to rapid sediment buildup. A stepwise approach—starting at the ridge, then addressing smaller and larger drains—helps effectively manage runoff and improves watershed sustainability.

Mini-zoo and Conservation breeding: Wildlife conservation and education are closely linked, with zoos playing a vital role in both. Their main goals include conserving endangered species through captive breeding programs that help replenish wild populations, educating the public by showcasing animal diversity to inspire awareness and appreciation, and conducting scientific research to better understand animal behavior, health, and reproduction. This research supports improved care in captivity and informs broader wildlife conservation efforts in natural habitats. *(FMP, SGNP, 2024-25 to 2033-34)*

1.7 Vision and Objectives of the Proposed Management

1.7.1 Vision

Wildlife conservation involves committed endeavours to protect both wildlife and their habitats, ensuring the welfare of species or populations within natural ecosystems. Within the realm of Sanjay Gandhi National Park, the primary objective of wildlife management is to cultivate a balanced coexistence between wildlife and human communities. The following part outlines the essential components needed to bring this vision into reality.

- Ecological Security
- Priority to Conservation
- Primacy for water and sustenance
- In situ conservation
- People’s support for wildlife
- Human-wildlife conflict

1.7.2 Objectives

Wildlife management involves the safeguarding of wild species and their habitats to establish sustainable relationships between wildlife and various human interests. The

objectives of management in Sanjay Gandhi National Park (SGNP) are outlined below:

- Safeguarding and preserving the unique ecosystems and biodiversity of the park.
- Implementing in-situ and ex-situ conservation measures for endangered wildlife species.
- Offering nature education to enhance public understanding and appreciation of the distinctive wildlife ecosystem.
- Encouraging active participation from the public for wildlife conservation within the landscape.
- Effectively managing human-wildlife conflict to promote mutual benefits and coexistence.
- Providing opportunities for focused and systematic research to enhance wildlife management effectiveness.

But, to achieve its objective SGNP is facing few problems which are listed below:

- Habitat degradation: Human activities threaten wildlife in multiple ways, including habitat destruction, the introduction of invasive species, and disease spread. Ecosystems often face several of these pressures at once, compounding stress on already fragile environments. In Sanjay Gandhi National Park, encroachments are a major concern, as they reduce habitat space and resources, making wildlife more vulnerable and increasing the chances of human-animal conflicts.

- Developmental activities: Urbanization increases the demand for connectivity, water, electricity, and other infrastructure, which impacts natural areas like Sanjay Gandhi National Park. High-tension power lines have led to the spread of invasive weeds and climbers in nearby forests, while surrounding roads contribute to road kills and introduce light and noise pollution. These disruptions, along with edge effects, negatively affect key ecosystem functions such as pollination and natural plant regeneration.

- Pollution: The urban population near Sanjay Gandhi National Park continuously contributes to pollution through sewage, plastic waste, vehicle and industrial emissions, and noise. These pollutants harm wildlife and ecosystems by spreading pathogens like bacteria and viruses, and by introducing toxic chemicals into the food chain. Over time, such contaminants can disrupt hormonal systems in both vertebrates and invertebrates, threatening species survival and potentially leading to their disappearance from the ecosystem.

- Invasive species: Invasive species can severely affect ecosystems by threatening native plants and animals, reducing biodiversity, competing for limited resources, and altering natural habitats. These changes not only disrupt ecological balance but also lead to significant economic losses. Sanjay Gandhi National Park exemplifies how such invasions can damage both the environment and the sustainable use of its natural resources.

Climate change: Most plants and animals depend on specific climate conditions, such as temperature and rainfall, to survive. Climate change disrupts these conditions, affecting entire ecosystems by altering species composition and life cycles. Wildlife

may be forced to shift their behavior and habitats in search of suitable conditions, often leading to increased human-wildlife conflicts and population declines. Additionally, climate change can trigger natural disasters, causing severe losses of life and habitat for both humans and wildlife. *(FMP, SGNP, 2024-25 to 2033-34)*

1.8 Summary & Conclusion

Sanjay Gandhi National Park (SGNP) holds immense ecological, recreational, and social significance for Mumbai. With strong public support for conservation, the park benefits from active community participation in environmental initiatives. It serves as a crucial source of water for the city and remains one of the few natural recreational spaces amidst the urban sprawl. Additionally, the park harbours indigenous flora and fauna of the Western Ghats, contributing to biodiversity conservation. The disciplined workforce further enhances the park's management and operations.

However, SGNP faces several internal challenges that hinder its efficient management. A rigid administrative structure limits the adoption of modern tools and technologies, and forest management tends to be more administrative than scientific. The Park also suffers from inadequate staffing, lack of systematic biodiversity studies, and an insufficient wildlife monitoring system. Frequent transfers of an untrained workforce further disrupt conservation efforts. Additionally, the absence of proper demarcation through walls or fences makes the park vulnerable to encroachments, while the lack of adequate forest fire-fighting tools increases the risk of uncontrolled wildfires.

Despite these challenges, SGNP has significant opportunities for conservation and sustainable management. Environmental conservation is a national and international priority, making it possible to secure funding and institutional support. The involvement of NGOs, academic institutions, and civil society organizations can further strengthen conservation efforts. As one of the four leading urban national parks in the world, SGNP has the potential to gain global recognition for its role in urban biodiversity conservation, especially given the immense population pressure it endures.

At the same time, several external threats continue to put pressure on the park's ecosystem. Encroachments are a persistent issue, leading to habitat loss and increasing human-wildlife conflict. Pollution from plastics and other disposables degrades the environment, while illicit tree felling and seasonal forest fires threaten the park's biodiversity. Poaching and illegal fishing also pose risks to wildlife conservation efforts. Additionally, the movement of leopards outside the protected area due to habitat disturbance has resulted in conflicts, and many leopards have fallen victim to speeding vehicles.

In conclusion, while SGNP faces multiple challenges, it has the potential for long-term sustainability through strategic conservation efforts and efficient management.

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2 LEGAL FRAMEWORK FOR ECO-SENSITIVE ZONES

2.1 Biodiversity in India

India is one of the world's most renowned 17 megadiverse countries of the world. India is a land area of 3.28 million hectares that is only 2.4 percent of the total land area in the world.
The Tropic of Cancer passing through the centre of India, the climate varies from tropical monsoon in south to temperate in north. But owing to a vast range in altitudes and topographies and the national borders traversing through mountainous and coastal territory, a variety of climate contexts are experienced throughout the country.

India exhibits immense diversity, not in terms of its climate but also physio-geography and ecological regime like mountains, plains, plateaus, coast, islands and deserts represented in as many as ten unique biogeographic zones.

A broad variety of ecosystems and habitats, including forests, grasslands, wetlands, deserts, coastal ecosystems and marine ecosystems, as a result of the diverse edaphic, climatic and topographic variables and centuries of geological stability. Wetland ecosystems in India are ranging from high altitude cold desert wetlands to hot and humid wetlands in coastal zones with diverse flora and fauna.

Biodiversity describes the richness and variety of life on earth. The term biodiversity was coined in 1985. It is important in natural as well as artificial ecosystems. It deals with nature's variety, the biosphere. It refers to variabilities among plants, animals and microorganism species. India has immense biodiversity wealth in terms of not just the number of floral and faunal species but also a diverse range of ecological landscapes. Four of the 34 global biodiversity hotspots are in India, replete with a diversity of endemic species.

According to UNDP, India harbours 7-8 per cent of all recorded species, including nearly 49,000 species of plants and over 1,00,000 species of animals and nearly half the world's aquatic plants. India also has a long coastline of about 7,517 km. Hence it is fortunate to have a wide variety of fish living in its inland waters. With 2,411 different fish species, the nation is 3rd largest producer of fish in the world. According to UNESCO World Heritage Convention, Western Ghats Mountain which predates the Himalayas represents geomorphic features of immense importance with distinctive biophysical and ecological processes. It extends 1600 km from Mumbai's North to India's Southernmost point. Western Ghats showcases best examples of the monsoon system on the planet, which helps to moderate the tropical climate of the area.

2.2 Eco Sensitive Zones – Genesis and Need

2.2.1 XXI Meeting of Indian Board of Wildlife

During the XXI meeting of the Indian Board for Wildlife held on 21st January 2002, a 'Wildlife Conservation Strategy-2002' was adopted wherein point No.9 envisaged that "lands falling within 10 km of the boundaries of National Parks and Sanctuaries should be notified as eco-fragile zones under Section 3 (v) of the Environment (Protection) Act and Rule 5 Sub rule (viii) & (x) of the Environment (Protection) Rules.". The Additional Director General of Forests (WL), vide letter dated 6th February 2002, had

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requested all the Chief Wildlife Wardens for listing out such areas within 10 km of the boundaries of National Parks and Sanctuaries and furnish detailed proposals for their notification as eco-sensitive areas under the Environment (Protection) Act, 1986. In response, some of the State Governments had raised concern over applicability of the 10 km range from the protected area boundary and informed that most of the human habitation and other areas including important cities in these states would come under the purview of Eco-Sensitive Zone and will adversely affect the development.

2.2.2 Decision of National Board for Wildlife

In response to the challenges raised by various states, the National Board for Wildlife (NBWL) conducted a re-evaluation of the proposal during its second meeting on March 17, 2005. After careful consideration, it was concluded that the delineation of eco-sensitive zones should be tailored to the specific characteristics of each site. Instead of imposing outright prohibitions, the focus would be on regulating certain activities to ensure environmental protection while accommodating regional requirements.

This decision was formally conveyed to all state governments through an official letter dated May 27, 2005. To reinforce compliance with this directive, additional communications and reminders were subsequently issued to the concerned authorities.

2.2.3 Honourable Supreme Court's Decision

The Goa Foundation filed a Public Interest Litigation (PIL) through Writ Petition No. 460/2004 in the Hon'ble Supreme Court, raising concerns about the declaration of Eco-Sensitive Zones (ESZs). In response, on December 4, 2006, the Supreme Court issued an order directing the Ministry of Environment, Forests & Climate Change (MoEFCC) to provide all states and union territories with a final opportunity to submit their responses to a prior letter dated May 27, 2005. The court instructed state governments to submit their ESZ proposals to the ministry within four weeks. Additionally, it mandated that any projects granted environmental clearance within a 10-kilometer radius of protected areas must be referred to the Standing Committee of the National Board for Wildlife (NBWL) for review.

2.2.4 Need for Eco Sensitive Zone Guidelines

The Hon'ble Supreme Court's directive on Eco-Sensitive Zones (ESZs) and their establishment around Protected Areas has highlighted a significant gap in the process—particularly in the absence of clear guidelines. On December 4, 2006, the Supreme Court mandated that all State and Union Territory Governments in India forward proposals for the declaration of ESZs surrounding their Protected Areas. Despite this order, only a few states, namely Haryana, Gujarat, Mizoram, Meghalaya, Assam, and Goa, have taken the initiative to submit such proposals. Several other states and Union Territories have not responded with proposals, and this lack of progress can likely be attributed to the absence of comprehensive and standardized guidelines for the process.

In a related legal matter, the Supreme Court issued a judgment on December 31, 2010, regarding a petition concerning the construction of a park near the Okhla Bird Sanctuary in Uttar Pradesh. In this case, the petitioner (Shri Anand Area & Ant vs. Union of India) pointed out that the Uttar Pradesh Government had not yet declared ESZs around its Protected Areas. The Court, upon reviewing the case, acknowledged that the Government of Uttar Pradesh had not taken action in this regard primarily due to the lack of specific guidelines from the Government of India on how to establish and define such zones. This judgment brought to light a fundamental issue: the absence of a clear framework and direction from the central government made it difficult for states to proceed with the declaration of ESZs.

Recognizing the need for a structured approach, the Ministry of Environment & Forests took proactive steps by establishing a committee to develop guidelines for identifying Ecologically Sensitive Areas (ESAs) across the country. The committee, chaired by Shri Pronab Sen, was tasked with defining the criteria for determining which areas should be considered ecologically sensitive. The committee's work was instrumental in identifying various parameters that could be used for such declarations, including factors like the richness of flora and fauna, the steepness of terrain (slope), the rarity and endemism of species present, and the origins of important rivers or water bodies. These parameters were developed with the intention of identifying regions that are ecologically significant and in need of protection.

However, while these parameters are useful for identifying broader Ecologically Sensitive Areas, they do not entirely align with the specific purpose of defining ESZs around Protected Areas. In the case of ESZs, the primary objective is not simply to identify areas of ecological richness, but to create a buffer zone around Protected Areas that serves a functional purpose. These zones are meant to act as "shock absorbers" or transition areas, helping to reduce human impact and activities that could negatively affect the integrity of Protected Areas. Rather than solely being defined by biodiversity richness or environmental factors, ESZs are more about managing and regulating human activities in the surrounding areas to protect the core Protected Areas.

For instance, activities such as construction, mining, and other industrial operations that could degrade the habitat of endangered species or disrupt critical ecological functions are restricted within ESZs. These zones also provide opportunities for managing tourism and other recreational activities that may otherwise lead to ecological damage. As transition zones, ESZs help in maintaining the ecological balance between human settlements and Protected Areas, ensuring that the surrounding environment remains conducive to the long-term sustainability of these areas.

2.2.5 Procedure to be adopted for Eco Sensitive Zones

The primary objective, as outlined earlier, is to regulate certain activities around National Parks and Wildlife Sanctuaries to reduce the adverse effects of these activities on the delicate ecosystems surrounding these Protected Areas. The first step towards achieving this goal is to conduct an inventory of land use patterns and activities within the vicinity of each Protected Area (including National Parks and

Sanctuaries), as well as important wildlife corridors. This inventory should document the various types and numbers of industries operating around these areas.

To carry out this task, it was suggested that the concerned range officers, who are familiar with the local area, be responsible for compiling information within a 10 km radius of their designated range. To support this effort, a small committee could be formed, consisting of the relevant Wildlife Warden, an ecologist, a representative from the local self-government, and an official from the revenue department of the concerned area. The committee would have several key responsibilities, including:

- Determining the extent of Eco-Sensitive Zones (ESZs): The committee would assess and suggest the appropriate boundaries for the Eco-Sensitive Zones surrounding the Protected Areas.
- Identifying the need for a buffer area: The committee would evaluate the requirement for such zones to act as a buffer or shock absorber, protecting the integrity of the Protected Area from external pressures.
- Recommending management methods: The committee would propose the best practices and strategies for managing the Eco-Sensitive Zones effectively, ensuring that they fulfill their protective role.
- Suggesting thematic activities for the master plan: The committee would outline a broad range of thematic activities to be incorporated into the region's master plan. These activities would aim to ensure sustainable management of the area while mitigating negative impacts on the environment.

2.3 Need for legal framework for Eco Sensitive Zonal Master Plan

A legal framework is essential for an Eco-Sensitive Zone (ESZ) Master Plan to ensure structured and enforceable conservation measures. It establishes clear guidelines to prevent harmful activities like deforestation, pollution and encroachment in eco-sensitive areas. It also helps in providing legal backing for authorities to monitor, regulate, and penalize violations, ensuring long term compliance. It helps in ensuring that the ESZ Master Plan complies with national policies, such as the Environment Protection Act (1986) and Wildlife Protection Act (1972) in India, or equivalent laws in other countries.

2.4 Legal Provision for Environment and Wildlife

India’s original Constitution did not contain any provision for the protection of the natural environment. However, the Fundamental Duties, which were added by the 42nd Amendment to the Constitution, prescribed the protection of the environment including forests, lakes, rivers and wildlife as a duty of the citizens of the country. This amendment also added new Directive Principles of State Policy, one of which was Article 48A, which directed the State to protect and improve the environment and to safeguard forests and wildlife.

These developments were a result of the United Nations Conference on Human Environment, held in Stockholm in 1972. First, the Wildlife Protection Act, 1972 was enacted. Then, the Water (Prevention and Control of Pollution) Act, 1974 was passed,

followed by the Air (Prevention and Control of Pollution) Act 1981. Then in 1986, the Environmental Protection Act was passed by the Parliament, in the wake of the Bhopal Gas Tragedy, which occurred on Dec 2, 1984.

2.4.1 Environmental Protection Act & Rules, 1986

Environment Protection Act, 1986 (EPA) is an Act of the Parliament of India. It was enacted in May 1986 and came into force on 19 November 1986. It has 26 sections and 4 chapters. The Act was passed by the Government of India under the Article 253 of the Constitution of India, which empowers to union government to enact laws to give effect to international agreements signed by the country. The Act is an "umbrella" legislation that has provided a framework for the environmental regulation regime in India, which covers all major industrial and infrastructure activities and prohibits and regulates specific activities in coastal areas and eco-sensitive areas. The Act also provides for coordination of the activities of various central and state authorities established under other environment-related laws, such as the Water Act and the Air Act.

The EPA empowers the Centre to "take all such measures as it deems necessary" in the domain of environmental protection.

- Under the law, it can coordinate and execute nationwide programmes and plans to further environmental protection.
- It can mandate environmental quality standards, particularly those concerning the emission or discharge of environmental pollutants.
- This law can impose restrictions on the location of industries.
- The law gives the government the power of entry for examination, testing of equipment and other purposes and power to analyse the sample of air, water, soil or any other substance from any place.
- The EPA explicitly bars the discharge of environmental pollutants in excess of prescribed regulatory standards.
- There is also in place a specific provision for handling hazardous substances, which is prohibited unless in compliance with regulatory requirements.
- The Act empowers any person, apart from authorised government officers, to file a complaint in a court regarding any contravention of the provisions of the Act.
- Section 3 of the Environment (Protection) Act (EPA), 1986 gives power to the central government, i.e., the Union Ministry of Environment and Forests, to take all measures that it feels are necessary for protecting and improving the quality of the environment and to prevent and control environmental pollution. *(EPA,1986)*

2.4.2 Wildlife Protection Act, 1972

The Wild Life (Protection) Act, 1972 is an Act of the Parliament of India enacted for the protection of plants and animal species. Before 1972, India had only five designated national parks. Among other reforms, the Act established scheduled protected plant and hunting certain animal species or harvesting these species was largely outlawed. The Act provides for the protection of wild animals, birds and plants;

and for matters connected or incidental thereto. It extends to the whole of India. *(WPA, 1972)*

2.4.2.1 Indian Board of Wildlife

The Indian Board for Wildlife (IBWL) was established in 1952 by the Government of India to advise the central government on wildlife conservation. The board was formed in response to a rapid decline in wildlife populations. The Indian Board for Wildlife was chaired by the Prime Minister. The Indian Board of Wildlife was established to to suggest measures to the government to develop national parks, sanctuaries, and geological gardens. It also sought to create awareness for the protection of wildlife and provide requisite resources for their conservation. During the 1970's the Government of India appointed a committee for recommending legislative measures and administrative machinery for ensuring environmental protection. Accordingly, a comprehensive central legislation was enacted in 1972 called the Wildlife (Protection) Act for providing special legal protection to our wildlife and to the endangered species of fauna in particular. The Wildlife (Protection) Act, 1972 was subsequently amended during 1991 and last during 2002.

2.4.2.2 National Board of Wildlife

The National Board for Wildlife came into existence with the Gazette Notification dated 22nd September 2003. It replaced the Indian Board of Wildlife. The National Board for Wildlife has 47 members with the Prime Minister in the Chair. The Minister in charge of the Ministry of Environment & Forests in the Central Government is the Vice-Chairperson. The Additional Director General of Forests (WL) & Director, Wildlife Preservation is the Member-Secretary to the Board. The Board is responsible for promotion of conservation and development of wildlife and forests.

2.5 National Wildlife Action Plans

The National Wildlife Action Plan (NWAP) is a policy framework formulated by the Government of India to address the conservation needs of the country's diverse wildlife. It was first introduced in 1983 and subsequently updated in the later years. It outlines strategic actions and priorities for the protection and management of wildlife and their habitats. The plan aligns with India's broader environmental and biodiversity goals and adheres to international conventions on wildlife conservation. A road map to conserve the wildlife of the country, in the form of an Action Plan, was mooted in the XV meeting of the, Indian Board for Wildlife (Now - NBWL) in 1982. Accordingly, a plan was prepared and launched in 1983. The plan evolved over time based on the learnings and emerging challenges. Till now, three phases of the National Wildlife Action Plan (NWAP) have been launched.

2.5.1 2nd National Wildlife Action Plan (2002-2016)

The National Wildlife Action Plan (NWAP) 2002–2016 emphasizes the critical role of landscapes beyond designated Protected Areas (PAs) in maintaining ecological connectivity. It recognizes that non-protected ecological corridors serve as essential linkages that facilitate genetic exchange, species movement, and ecosystem resilience. The NWAP underscores the necessity of safeguarding these corridors to prevent habitat fragmentation, which can lead to the progressive decline and eventual loss of biodiversity.

To address this concern, the Action Plan highlighted the need for long-term land and water use policies that integrate conservation imperatives. It stressed that ecologically fragile habitats require stringent protection measures, while sustainable resource utilization should be carefully regulated in adjoining landscapes. This approach aligns with the broader principles of landscape-level conservation and integrated ecosystem management, which are critical for ensuring the long-term viability of biodiversity hotspots.

Furthermore, the NWAP mandates that all identified ecological linkages, buffer zones, and wildlife corridors surrounding Protected Areas be designated as ecologically fragile areas (EFAs) under the provisions of the Environment (Protection) Act, 1986. This legal framework provided a robust mechanism for conservation-driven land use planning, ensuring that developmental activities in these sensitive regions are subjected to strict environmental regulations. The implementation of this directive necessitated scientific assessment, spatial mapping, and policy integration to delineate and effectively manage ecologically sensitive zones. *(NWAP, 2002-16)*

2.5.2 3rd National Wildlife Action Plan (2017-2031)

The Second National Wildlife Action Plan (NWAP) (2002-16) marked a significant phase in India's conservation efforts. At the beginning of this plan, there were approximately 400 Protected Areas (PAs) covering around 1.56 lakh km². Presently, this has expanded to 733 Protected Area's spanning 1.60 lakh km², accounting for 4.89% of the country's geographical area. The NWAP outlines crucial strategies for strengthening and improving Protected Area Management, mitigating human-wildlife conflicts, and regulating tourism in wildlife regions.

The previous NWAP recommended various measures to expand and fortify the Protected Area network, focusing on management effectiveness. The new NWAP emphasizes the establishment of new Protected Areas, formulation of guidelines, and identification of potential conservation and community reserves. A key directive includes implementing recommendations from the Wildlife Institute of India (WII) to optimize Protected Area networks. Furthermore, the plan urges the completion of legal formalities for the final notification of existing and new Protected Areas and necessary boundary readjustments to align with ecological and natural features. All Protected Areas must also have scientifically and ecologically sound management plans to ensure sustainable conservation efforts.

With expanding human settlements and shrinking wildlife habitats, human-wildlife conflicts have become increasingly frequent. The NWAP underscores the need for mitigation strategies that incorporate community participation, scientific research, and innovative solutions. It highlights the importance of early warning systems, compensation mechanisms, and habitat restoration to minimize conflicts. Additionally, the plan calls for strengthening wildlife corridors to facilitate the safe movement of species and prevent habitat fragmentation.

Tourism in wildlife areas has both economic and ecological implications. The NWAP advocates for sustainable eco-tourism models that generate local employment while ensuring minimal environmental impact. The action plan recommends strict regulation

of tourism activities, including carrying capacity assessments, visitor education programs, and responsible tourism practices. It also stresses the importance of community-based conservation initiatives to foster local stewardship in Protected Area management.

The action plan focuses on the expansion of Protected Areas through the identification and declaration of new conservation and community reserves. Improved Protected Area management is a priority, requiring scientific planning and legal finalization of boundaries. Addressing human-wildlife conflict is another key aspect, with an emphasis on strengthening community-based approaches. Sustainable wildlife tourism is promoted through the implementation of eco-friendly policies that regulate visitor activities while benefiting local communities. Additionally, research and capacity building are encouraged to enhance monitoring, patrolling, and training for better conservation outcomes.

By incorporating these strategies, the NWAP aims to strengthen India's biodiversity conservation framework while balancing ecological sustainability with human development needs. The successful implementation of these recommendations requires multi-stakeholder collaboration, policy integration, and continuous evaluation of conservation outcomes. *(IWAP, 2017-31)*

2.6 Eco Sensitive Zone of the Sanjay Gandhi National Park

The Ministry of Environment, Forest, and Climate Change issued a Notification No: 3645E on December 5, 2016, regarding the Eco-Sensitive Zone (ESZ) of Sanjay Gandhi National Park (SGNP). As per this notification, the Government of Maharashtra has delineated and published the Eco-Sensitive Zone surrounding the national park. Sanjay Gandhi National Park, a unique natural habitat situated within the metropolitan region of Mumbai, spans across Thane and Mumbai districts in Maharashtra. It is geographically located between latitude 19° 8.8' N to 19° 21' N and longitude 72° 53' E to 72° 58' E.

The Ministry of Environment, Forest, and Climate Change has defined the extent of the Eco-Sensitive Zone in varying dimensions, ranging from 100 meters to 4 kilometres from the park's boundary, covering a total area of 59.456 sq. km. The detailed geographical description of the Eco-Sensitive Zone is provided in Annexure I of the notification, while Annexure II includes a map delineating the zone's boundary. Additionally, Annexure III lists the villages and survey numbers falling within the Eco-Sensitive Zone*. (MoEFCC ESZ notification, 2016)*

To regulate and manage activities within this ecologically sensitive area, the Government of Maharashtra has prepared a Zonal Master Plan in accordance with the guidelines issued by the Ministry of Environment, Forest, and Climate Change, Government of India. This plan has been developed in consultation with all relevant departments, including Environment, Forest, Urban Development, Tourism, Municipal Administration, Revenue, Agriculture, Maharashtra State Pollution Control Board, Irrigation, and Public Works Department.

The Government of Maharashtra shall implement measures to enforce the provisions of the notification, covering key aspects such as land use, natural springs, tourism,

natural heritage, man-made heritage sites, noise pollution, air pollution, effluent discharge, solid waste management, biomedical waste disposal, vehicular traffic, and industrial units.

Additionally, a detailed list of prohibited activities and regulated activities within the Eco-Sensitive Zone (ESZ) is also specified. Please refer the notification in detail.

2.7 Maharashtra Regional & Town Planning (MRTP) Act, 1966

The MRTP Act, 1966, provides a framework for urban planning and development in Maharashtra. All lands are zoned for development as per the Plans and regulations published under the MRTP Act 1966. It contains provisions for formulation of the Development Plan, manner in which land may be developed as well as provisions for carrying out the modification of the existing Development Plan, where a change in the use of the land is required.

More than 90% of the Land falling under the ESZ falls within the jurisdiction of an Urban local body where Development plans are already in force. Thus, the masterplans or Development Plans for development of land already exists for 90% of the ESZ. For the remaining part the Regional Plan has been published under the MRTP Act 1966.

When planning for ESZs, it's crucial to harmonize the provisions of the Environment (Protection) Act and the ESZ notification along with the MRTP Act to ensure cohesive and sustainable development and to ensure the protection of environment in the buffer zone of the National Parks.

Since existing development plans and regional plans are already in place of all the ULBs under Eco Sensitive Zone, minor modifications to the land use may be carried out under applicable section 37 of MR&TP Act,1966 if the activities carried out are prohibited as per the ESZ notification. *(MR&TP Act, 1966)*

2.8 Summary & Conclusion

The Development Plans along with the Development Control and Promotion Regulations sanctioned under the MRTP Act 1966, for Urban Local bodies falling within the ESZ, regulates the type of development and activities that can be carried out on any land – Buildings, infrastructure, non-buildable uses of land etc.

The Environmental Protection Act & Rules 1986, the Wildlife Protection Act 1972 stipulates the protection of Wildlife and Environment, with respect to Eco Sensitive Zones of National Park which act as a buffer zone or a transition zone between humans and animals, in order to preserve the ecological balance.

A Development plan exists for more than 90% of the extent of ESZ, by virtue of being a part of an Urban Local body. The uses of Land are already defined and a large part of the land is already developed. Land within ESZ where the proposed zoning for development is in conflict with the activities prohibited under the ESZ Notification 2016, such Zones will need to be modified under the relevant provision of the MRTP Act 1966. And for land where activities are being carried out in contravention of the

provisions of the MRTP Act 1966, as well as ESZ notifications 2016, suitable actions shall be recommended under relevant statutory provisions to remedy the conflict.

In conclusion, mitigation measures are required to be suitably recommended to mitigate wildlife conflicts or for Environmental Protection for all areas in ESZ, where Environmental, Wildlife or activity conflicts exists and identified in the course of the study.

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3 REGIONAL & PHYSICAL SETTING OF ESZ

The Sanjay Gandhi National Park (SGNP) and its ESZ is located within one of India's most populous urban regions – the Mumbai Metropolitan Region and is surrounded by cities, towns and peripheral outgrowths. This section gives an overall summary regarding the extent, areas, jurisdictions and regional setting of the Eco-Sensitive Zone for Sanjay Gandhi National Park.

3.1 Extent of the Eco Sensitive Zone of SGNP

The extent of the Eco Sensitive Zone of the Sanjay Gandhi National Park is defined by two boundaries and the area which falls within the two boundaries is the Eco Sensitive Zone. The total area of the Eco Sensitive Zone as per the Notification is 59.45 Sqkm.

- Boundary of the Sanjay Gandhi National Park (SGNP)
- Boundary of the Eco Sensitive Zone (ESZ of SGNP)

3.1.1 Sanjay Gandhi National Park (SGNP) Boundary

The Sanjay Gandhi National Park was notified by the Land and Revenue Department, Government of Maharashtra vide Notification No. WLP/1094/OR 177/F-I on 16th January 1996. The Notification was in succession to an earlier notification No. PGS. 1081/131724/F-5, dated 4th February 1983, under subsections (1) and (2) of Section 35 of the Wildlife (Protection) Act, 1972 (53 of 1972), the Government of Maharashtra had declared its intention to constitute the specified area as a National Park by the name Sanjay Gandhi Rashtriya Udyan or the Sanjay Gandhi National Park. Within its extent, it includes the following Villages in whole or in part falling within Thane District and Mumbai Suburban District. Refer the Notification of Sanjay Gandhi National Park in Annexure III of the Report.

Table 3.1: Villages, Extent & Area - Sanjay Gandhi National Park

Sr.No.	Village	Survey No.	Hectares
Revenue Villages of Thane District			
1	Kashi	106	341.06
2	Mira	260	137.50
3	Ghodbunder	192,217,243	69.45
4	Yewoor	106	1267.27
5	Majiwade	418,419,420	144.17
6	Panchpakhadi	519,520,521	205.22
7	Kavesar	156,291,292	130.21
8	Kolshet	291	14.03
9	Nagla	73	439.33
10	Sarjamore	165	91.35
11	Sasunavghar	385	1157.85
12	Shilottar	23	4.17
13	Chene	7,8,10,27,28,37,89,99,101	1151.57
14	Ovale	289	7.05
15	Borivare	82,87,88	14.20
Total			5174.50
Revenue Villages of Bombay Sub-Urban District			
1	Gundgaon	84,120,124	485.25

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2	Sai	13,19,163,175	77.72
3	Clearabad	54,57	22.00
4	Mulund	356,357,374,376,378	77.58
5	Nahur	166,167,175,177,148	63.24
6	Tulsi	6	745.22
7	Vihar	188	219.49
8	Dahisar	345/B	147.71
9	Akurli	87/B	20.06
10	Poisar	42/B	224.81
11	Magathane	34/B	1095.56
12	Malad	239/1	343.38
Total			3522.07
Grand Total			**8696.58**

Source: SGNP Notification, 1996

The boundary of the Sanjay Gandhi national park is drawn, basis the 1996 SGNP notification over the georeferenced village maps, in consultation with the officials of SGNP, which is also referred to in the ESZ notification for the Sanjay Gandhi National Park. However, there is another boundary known as SGNP Division Boundary which includes areas outside notified SGNP which were subsequently acquired by SGNP over the period of time whose total area comes to 10695 Ha. The boundary of SGNP shown in the ESZ notification Map in Annexure II of the notification on Page 31, coincides with the boundary of the SGNP, as per the 1996 Notification and which has been adopted for the preparation of the ESZ Zonal Masterplan.

3.1.2 Eco Sensitive Zone Boundary of SGNP

The Eco Sensitive Zone boundary for the Sanjay Gandhi National Park varies from a distance of 100 metres to 4 Km around the boundary of the SGNP. As per the MOEFCC notification for ESZ "Notification No: 3645E Dated: 05.12.2016 Final Eco Sensitive Zone around Sanjay Gandhi National Park", the following Villages form a part of the Eco Sensitive Zone of the Sanjay Gandhi national Park. The notification contains the coordinates of the SGNP & ESZ – SGNP on page number 29-30 and 33-34 Respectively. The Map showing the delineated SGNP and ESZ – SGNP boundary is on page no 31 and page no 32 of the said notification. The said notification also consists of the Villages and survey numbers falling within ESZ notification from Page no 36 to page no 40.[1]

Table 3.2: Villages, Extent & Area – Eco Sensitive Zone of SGNP

Sr. No.	Taluka	Name of Villages	Eco Sensitive Zone		Total (Ha.)
			Private Land (Ha.)	Forest Area (Ha.)	
1	Kurla	Mulund	18.5900	2.8000	21.3900
2		Nahur	15.6800	2.8730	18.5530
3	Borivali	Gundgoan (Vihar Lake)	293.1100	45.5270	338.6370
4		Vihar (Vihar Lake)	510.7900		510.7900
5		Area of Aarey Dairy Division & areas handed by Aarey to other	1114.7400		1114.7400

[1] MOEFCC notification for ESZ "Notification No: 3645E Dated: 05.12.2016 Final Eco Sensitive Zone around Sanjay Gandhi National Park

		State Departments			
6		Area of the Filmcity - Maharashtra Film, Stage and Cultural Development Department. (Under village Aarey-pt, Saei- pt & Gundgaon pt)	210.8300		210.8300
7	Andheri	Marol (Moroshi)	97.0000	76.0000	173.0000
8	Borivali	Saie	137.3100	3.3150	140.6250
9		Clerabad	10.6817	0.3950	11.0767
10		Malad	95.1200		95.1200
11		Akurli	17.2300	99.7090	116.9390
12		Poisar	16.1200	119.4910	135.6110
13		Magathane	26.2800	575.3310	601.6110
14		Kanheri	19.7700	12.6060	32.3760
15		Dahisar	39.7400	87.8330	127.5730
16	Thane	Kashi	34.0900		34.0900
17		Mira	23.0000		23.0000
18		Ghodhunder	38.0400	0.5570	38.5970
19		Versava	58.6500	102.0840	160.7340
20		Chene	185.3700	13.9150	199.2850
21		Owala	92.6500	415.1470	507.7970
22		Vadavali	1.9100		1.9100
23		Borivade	11.5900	136.8300	148.4200
24		Kavesar	42.0000		42.0000
25		Kolshet	10.8400		10.8400
26		Manpada	49.4054	68.1410	117.5464
27		Majiwada	66.8900	1.7200	68.6100
28		Pachpakhadi	42.0000	4.8350	46.8350
29		Yeur	197.4530	6.1690	203.6220
30	Vasai	Sasunavghar	103.3200	130.5810	233.9010
31		Mori	164.5300		164.5300
32		Poman	79.1300		79.1300
33		Kaman	12.1400		12.1400
34		Shilottar	3.6300		3.6300
35	Borivali	Shimpoli		4.8460	4.8460
36		Borivali Tarf Malad		7.2490	7.2490
37		Kandivali		0.7520	0.7520
38		Tulsi	120.0000		120.0000
39		Nagle	39.3202	6.2625	45.5827
40		Paspoli	18.7100		18.7100
41		Kanjur	3.0000		3.0000
	Total		**4020.6603**	**1924.9685**	**5945.6288**

N.B.: 1. The above survey number wise list is as per available village maps and records of the office of the DCF, Thane.

Source: MOEFCC Notification S.O.3645(E)

3.2 ESZ - Jurisdictions

The Eco-Sensitive Zone (ESZ) of Sanjay Gandhi National Park (SGNP) covers an area of 59.456 sq.km as per the Notification. It is spread amongst districts of Palghar, Thane & Mumbai Suburban and consists of the parts four Urban Local Bodies and one Regional Planning Authority.

Table 3.3: Area and Jurisdiction of Land falling in ESZ of SGNP

Urban Region	District	Urban Local Body/ Planning Authority
Mumbai Metropolitan Region (59.456 Sq Km)	Mumbai Suburban (35.3386 Sq.km.)	Brihanmumbai Municipal Corporation (35.3386 Sq.km.)
	Thane (17.0045 Sq.km.)	Thane Municipal Corporation (12.3652 Sq.km.) Mira Bhayandar Municipal Corporation (4.6393 Sq.km.)
	Palghar (6.4972 Sq.km.)	Vasai Virar City Municipal Corporation (3.2421 Sq.km.) Vasai Taluka under Town Planning Division (Palghar District) (3.2551 Sq.km.)
	Water Body (0.6157 Sq.km.)	Ulhas River/ Vasai Creek (0.6157 Sq.km.)

Source: Consultant Analysis

3.2.1 Mumbai Metropolitan Region (MMR)

The Mumbai Metropolitan Region (MMR) is a vast metropolitan area encompassing Mumbai and its surrounding urban areas consisting of 7 Municipal Corporation, 8 Municipal Council and 1000+ Villages spread across the districts of Thane, Raigad, and Palghar. Spanning approximately 6,328 square kilometres, the MMR is one of the most populous metropolitan regions globally, with a population exceeding 2.6 Crores. The Mumbai Metropolitan Region Development Authority (MMRDA), established on January 26, 1975, under the Mumbai Metropolitan Region Development Authority Act of 1974, is responsible for the planning and development of the MMR. The MMRDA oversees infrastructure projects, transportation planning, and housing development to ensure coordinated and sustainable growth within the region. To address these issues, the MMRDA has implemented various regional plans, such as the Regional Plan for MMR 2016-2036, which outlines strategies for balanced development, environmental sustainability, and improved quality of life for residents. The MMR continues to evolve as a dynamic urban agglomeration, playing a pivotal role in India's economic growth and development.

Sanjay Gandhi National Park and Tungareshwar National Park both fall within the boundary of the Mumbai Metropolitan Region.

Few environmental features that the MMR houses are Coastal and Marine Ecosystems such as Arabian Sea Coastline, Mangrove Forests and Coastal Regulation Area, Major Rivers and Lakes such as Mithi River, Ulhas River, Oshiwara, Dahisar and Poisar River, Powai Lake, Vihar Lake, Tulsi Lake, Reservoirs such as

Tansa, Bhatsa and Vaitarna, Wetlands such as Vasai and Navi Mumbai Wetlands, Forest and Hills such as SGNP, Aarey and Western Ghat (Sahyadri Hills).

3.2.2 Brihanmumbai Municipal Corporation (BMC)

The Brihanmumbai Municipal Corporation, is the governing civic body of Mumbai, the capital city of Maharashtra. It was established under the Bombay Provincial Municipal Corporation Act 1888. However, the Development Plan 2034 for Greater Mumbai excludes SPA area and was prepared for 415.05 sq km. Within the Brihanmumbai Municipal Corporation, the Eco-Sensitive Zone extends from Mulund in the East to Mahajanwadi in the West and passes along Bhandup, Powai, Aarey Colony, Malad and Borivali areas.

3.2.3 Thane Municipal Corporation (TMC)

Thane Municipal Corporation is the governing body of the Thane city, Maharashtra. It is one of the fastest growing areas of the Mumbai Metropolitan Region. Spanning an area of about 128.23 km², the city is located at an elevation of 7 meters above sea level. Thane is bordered by the Yeoor Hills on one side and is dotted with numerous beautiful lakes, which are a cause of cooler weather than that of Mumbai. It is divided by Thane Creek, a stream of water from the Ulhas River and Arabian Sea forming an estuary. In Thane Municipal Corporation, the Eco-Sensitive Zone extends from Bhayandarpada in the north to Shri Nagar in the south and passes along Gaimukh, Owale, Manpada, Kokanipada, Yeoor, Lokmanya Nagar and along Wagle Estate.

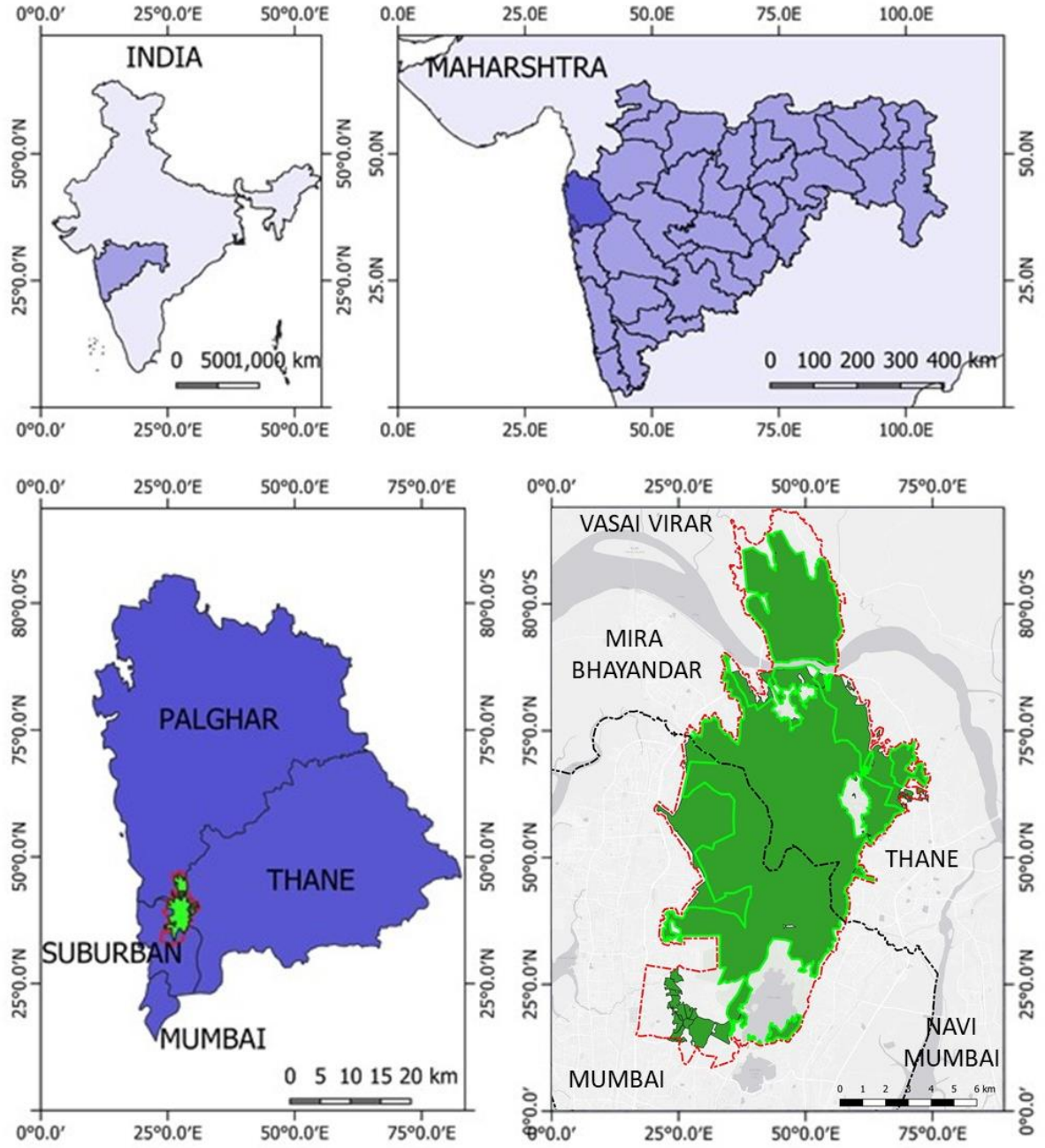
3.2.4 Mira Bhayander Municipal Corporation (MBMC)

Mira Bhayander city is located in the district of Thane at the northern threshold of Greater Mumbai. The city is situated on the southern part of the Vasai creek with Sanjay Gandhi National Park on the east and Arabian Sea on the west. It is located at the mean sea level on the northern part of the Konkan region. The city occupies a unique position in the region, due to close proximity to the Greater Mumbai and lower cost of living. The total area of the Mira Bhaindar Municipal Corporation limit is 79.40 Sqkm. In Mira Bhayandar Municipal Corporation, the Eco-Sensitive Zone extends from Mahajanwadi in the south to Versave in the north and passes along Kashi, Retibandar and Ghodbunder areas.

3.2.5 Vasai Virar City Municipal Corporation (VVCMC)

The Vasai Virar City Municipal Corporation was established on 3rd July 2009. The geographical area of VVCMC is 311 sq.km. VVCMC is declared as Special Planning Authority for 21 villages in Vasai Virar Sub Region. The geographical jurisdiction extent of VVCMC including SPA is 380 sq.km. It is the only Metropolitan City which have population more than 10 lakhs in Palghar district. It is located at North Mumbai. The city has significant growth potential due to close proximity to Greater Mumbai. Within VVCMC jurisdiction the Eco-Sensitive Zone passes along Navghar, Mori, Shilottar and Nagle areas.

Figure 3.1: Regional Setting of SGNP and ESZ



Source: Consultant Analysis

3.3 Regional Setting

Sanjay Gandhi National Park (SGNP), is a unique habitat enclosed in the metropolis of Mumbai and is located between Borivali, Thane, and Palghar on the northern outskirts of Mumbai between N 19º 8.8" to 19º 21" latitude and E 72º 53" to 72 º 58" longitudes. However, its Eco Sensitive Zone spans from 100m at places to maximum of 4km.

The National Park's current area of 106.95 km^2 is divided into three ranges, Krishnagiri Upavan, Tulsi and Yeur. Krishnagiri Upavan is the recreational area and is the smallest range in the National Park and covers an area of approximately 18.83

km^2. The Tulsi and Yeur ranges cover a much larger area of approximately 28.87 km^2 and 59.23 km^2, respectively. There are also the two lakes in the park, Tulsi and Vihar, which cover an area of approximately 8.5 km^2. The National Park can be divided into two other areas called the Borivali area and the Thane area.

Table 3.4 Ranges and their classification of forest

Sr.no.	Range	Reserved Forest	Protected Forest	Acquired Forest	Unclassed Forest	Total
1	Krishnagiri Upvan Borivali	7.249	5.598	647.416	1,223.040	**1,883.303**
2	Tulsi	1,707.580	0.000	0.000	1,180.256	**2,887.835**
3	Yeur	4,000.270	8.519	884.794	1,030.320	**5,923.903**
	Total	**5,715.099**	**14.117**	**1,532.210**	**3,433.616**	**10,695.041**

Source: SGNP

The Eco Sensitive Zone occupies most of the northern suburbs of Mumbai. To the west lie the suburbs of Goregaon, Malad, Kandivali, Borivali and Dahisar. To the east lie the suburbs of Bhandup and Mulund. To the south lie the Aarey Milk Colony and the university campus of IIT Bombay. The northern reaches of this forest lie in Thane city. The Park and the areas surrounding it, except Thane city, are all part of Mumbai. It is the only protected forest located within the limits of a city.

The Park entrance is located in the eastern section of Borivali, 0.9 km from Borivali station, which is 40 km north of Mumbai Central station, with suburban trains running every 5 minutes. It is well connected with all parts of Mumbai and Maharashtra by road. The Western Express Highway (NH 8) passes by the park entrance. Bus services are available from Mumbai to the park. The Park can be accessed from the eastern side through Yeoor, Thane.

3.4 Regional Connectivity

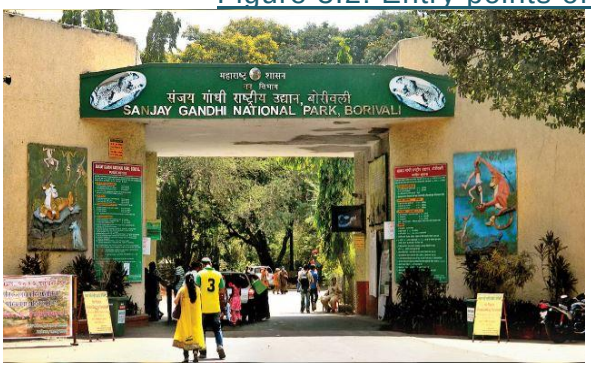
Considering the colossal extent of Sanjay Gandhi National Park amongst four municipal corporations, there are mainly four entry points namely,

- Main Entrance or Borivali Entrance
- Aarey Gate or Elephant Gate (Southwest Entry Gate)
- Bhandup Complex Entrance (Eastern Entry Gate)
- Yeoor Naka (Madhuban Entry Gate)
- Manpada Entry Gate
- Sasunavghar Entry Gate

However, only two entry points viz., Borivali Entrance and Yeoor Entrance are open to public at present. Other entrances are used only for official vehicles since entry into the BMC complex is restricted, and the Elephant Gate provides access to the Core Zone of the SGNP and is not open to the public in any case.

Hence, the regional connectivity parameters for the Eco-Sensitive Zone shall be discussed in conjunction with any of the entry points of Sanjay Gandhi National Park.

Figure 3.2: Entry points of SGNP at Borivali & Yeoor



Source: Field Survey, Consultant

3.4.1 Road Network Connectivity

The main entrance or Borivali entrance of the national park is on Western Express Highway which in the north is also known as Mumbai-Ahmedabad National Highway (NH-48). Yeur Naka Entrance is approachable from Pokhran Road No.1. Western Express Highway which becomes Mumbai-Ahmedabad Highway in the north, Eastern Express Highway, Lal Bahadur Shashtri Marg, Jogeshwari Vikhroli Link Road, Ghodbunder Road and Chinchoti Anjur Phata Marg provides connectivity throughout its ESZ area.

3.4.2 Railway Connectivity

The main entrance or Borivali entrance of the national park is located on the eastern side of Borivali Railway Station at a distance of roughly 1 km. Chhatrapati Shivaji Maharaj Terminus (CSMT) Railway Station is about 50 km from the park. Major Stations on Eastern suburbs are Thane, Mulund, Nahur, Bhandup, Kanjurmarg which provides connectivity to ESZ area and in Western suburbs are Jogeshwari, Ram mandir, Goregaon, Malad, Kandivali, Borivali and Dahisar which provides connectivity to ESZ area.

3.4.3 Airport Connectivity

The nearest Airport is Chhatrapati Shivaji Maharaj International airport at a distance of 15 km the main entrance or Borivali entrance of the national park. Nearest point from the airport to ESZ spans around 6 Km and Farthest point spans around 50 Km.

3.4.4 Mass Rapid Transit System

Mumbai Metro Line-7 connecting Dahisar to Andheri which is under operation since April 2022 is the nearest metro line from SGNP main entrance. The other approved metro line (passing along SGNP ESZ include Green Line (Line-10): Gaimukh – Shivaji Chowk in Mira Road. Aqua Line (Metro Line-3): Colaba to Seepz have service depot at Aarey. Green Line (Line-4): Wadala to Kasarvadavali passes near to ESZ areas in eastern suburbs. Pink Line (Line-6): Swami Samarth Nagar to Vikhroli passes near to ESZ areas which has a interchange station with Metro Line 3 at Aarey Colony area.

Thane Metro project with 1 circular line and 22 stations is a 29 km light rail transit (LRT) system proposed to be built in Thane, Maharashtra by Maharashtra Metro Rail Corporation Limited (Maha Metro). Thane Meteorite's Detailed Project Report was approved by the Thane Municipal Corporation (TMC) in December 2020 and is

currently awaiting the state government's approval. An appreciable portion of the Thane Metrolite route passes through or along the vicinity of SGNP ESZ.

3.4.5 Waterways Connectivity

Vasai creek passing through the SGNP division from west to east divides it into North block (Nagla Block) and South Block. Nearest jetty is Nagla Bunder Jetty which is present in the north of the creek whereas Gaimukh Jetty located to the south of creek along the Ghodbunder Road is in the close vicinity of SGNP ESZ.

3.5 Demography

The Eco Sensitive Zone (ESZ), ranging from 100 meters to 4 Km in different areas, houses a significant population.

Table 3.5 Total Estimated Population of ESZ

Jurisdiction	Area in ESZ (SqKm)	Estimated Population (2011)
BMC	35.33	5,87,224
MBMC	4.63	15,650
VVCMC	3.24	1,949
VT	3.25	1,057
TMC	12.36	28,809
Ulhas River	0.6157	-
Total	**59.456**	**6,34,689**

Source: Consultant Analysis

For BMC, a total of 8 wards falls within the ESZ. For each of these wards, gross population density has been calculated based on the respective ward's total population and area. This gross density is then applied to estimate the population residing within the ESZ portion of each ward by multiplying it with the area of the ward that lies within the ESZ.

Table 3.6 Estimated Population of the ESZ,BMC

Name of ward	Ward Population	Area (Ha)	Gross Density (PPH)	Area in ESZ (Ha)	Estimated Population in ESZ (Nos)
K/E	8,23,885	2400	343	69.88	23989
P/S	4,63,507	2529	183	1151.50	211043
P/N	9,41,366	4672	201	166.56	33560
R/S	6,91,229	1831	378	264.99	100038
R/C	5,62,162	4803	117	634.81	74301
R/N	4,31,368	1418	304	115.55	35151
S	7,43,783	2975	250	112.26	28066
T	3,41,463	4288	80	1018.13	81076
Grand Total	**49,98,763**			**3533.68**	**5,87,224**

Source: Census,2011 and Consultant Analysis

As per the data from the Tribal Development Department, the total estimated population of Padas that falls within ESZ in BMC area is 3626.

Population for MBMC which has been derived on the basis of the ward population mentioned as per election wards 2022. Gross density has been identified for each of

the 2 wards that falls in the Eco Sensitive Zone based on the ward population and the area of the ward. This gross density is then utilised to find the population in the ESZ area of the ward by multiplying the gross density with the area of the ward within the ESZ.

Table 3.7 Estimated Population of the ESZ, MBMC

Name of ward	Ward Population	Area (Ha)	Gross Density (PPH)	Area in ESZ (Ha)	Estimated Population in ESZ (Nos)
26	20,714	490	42	87.66	3,706
35	22,001	693[2]	32	376.22	11,944
Grand Total	**42,715**			**486.64**	**15,650**

Source: State Election Commission Maharashtra and Consultant Analysis

Population which has been derived on the basis of the ward population mentioned as per Enumeration Block 2011 for VVCMC. Gross density has been identified for each of the 2 wards that falls in the Eco Sensitive Zone based on the ward population and the area of the ward. This gross density is then utilised to find the population in the ESZ area of the ward by multiplying the gross density with the area of the ward within the ESZ.

Same process is followed to identify population for Malajipada village in ESZ and combined total is given below.

Table 3.8 Estimated Population of the ESZ, VVCMC

Name of ward	Ward Population	Area (Ha)	Gross Density (PPH)	Area in ESZ (Ha)	Estimated Population in ESZ (Nos)
78	17093	1340.90	13	98.17	1251
79	12136	4397.40	3	154.39	426
Malajipada	1437	378.69	4	71.65	272
Grand Total	**30,666**			**324.21**	**1,949**

Source: Census 2011 and Consultant Analysis

Population has been derived on the basis of the village population mentioned as per Census 2011 for Vasai Taluka. Gross density has been identified for each of the 4 prabhag that falls in the Eco Sensitive Zone based on the ward population and the area of the ward. This gross density is then utilised to find the population in the ESZ area of the ward by multiplying the gross density with the area of the ward within the ESZ.

Table 3.9 Estimated Population of the ESZ, Vasai Taluka

Name of village	Village Population	Area (Ha)	Gross Density (PPH)	Area in ESZ (Ha)	Population in ESZ
Sarjamori	289	372.00	1	3.04	~0
Mori	1158	253.93	5	158.69	724

[2] Area considered for this ward is only 35% since, other 65% is entirely covered with forest.

Poman	2046	1061.56	2	83.39	161
Shilottar	333	34.00	10	5.56	54
Nagale	1544	984.31	2	74.83	117
Grand Total	**3,493**			**325.51**	**1,057**

Source: Census 2011 and Consultant Analysis

Population has been derived on the basis of the Prabhag population mentioned as per Enumeration Block 2011 for TMC. Gross density has been identified for each of the 4 prabhag that falls in the Eco Sensitive Zone based on the ward population and the area of the ward. This gross density is then utilised to find the population in the ESZ area of the ward by multiplying the gross density with the area of the ward within the ESZ.

Table 3.10 Estimated Population of the ESZ, TMC

Name of ward	Ward Population	Area (Ha)	Gross Density (PPH)	Area in ESZ (Ha)	Population in ESZ
Majivade-Manpada Prabhag Samittee	54028	4001.88	14	763.67	10691
Vartak Nagar Prabhag Samittee	61394	2524.74	24	410.74	9858
Lokmanya Nagar-Sawarkar Nagar Prabhag Samittee	57658	474.17	122	44.16	5388
Wagle Estate Prabhag Samittee	55886	348.23	160	17.95	2872
Grand Total	**228,966**			**1236.52**	**28,809**

Source: Census 2011 and Consultant Analysis

3.6 Physical Features

Located in the north centre of Peninsular India, with a command of Arabian sea through its port of Mumbai, Maharashtra has a remarkable physical homogeneity, enforced by its underlying geology. This chapter mainly focuses on the geographical features of the project area. The chapter commences with a briefing of the topography and climatic trends observed in the planning area. The succeeding sections will give an overall picture about the major water bodies within the planning area.

3.6.1 Topography

3.6.1.1 Geographic Structure

As per Wildlife Institute of India's Bio-geographic classification, SGNP and its ESZ falls in "The Western Ghat Bio-Geographic Zone-5". The Bio- Geographic province is "The Malabar Coast-5A". It is one of the least protected Bio-Geographic Zone in India, though rich in floral and faunal life.

3.6.1.2 Topography

The terrain is mainly hilly and undulating. Plains are few and in small patches. At some places the hills are very steep giving way to precipices and rocky outcrops with maximum altitude of around 450m. These constitute the edge of Sahyadri and are oriented mainly in the north-south direction. Topography in ESZ region varies from planar to hilly areas with more than 20% of slope.

3.6.1.3 Geomorphology

Mumbai's geology is largely volcanic, with a mix of mafic (basalt and dolerite), intermediate (andesite), and felsic (rhyolite) rocks spread across its islands. The region lies within the Deccan Traps, which are mainly made up of basalt. In the Borivali area, especially within the Sanjay Gandhi National Park (SGNP), distinctive Borivali lavas appear as pillow-shaped formations with lobes, toes, and tubes, forming small mounded outcrops. These lavas are prominently visible in the dry bed of the Dahisar River and continue as denser rock formations along its banks, especially near the Kanheri Caves. The presence of pillow lavas and fossil-rich interlava sediments in some parts of the islands suggests they were once shallow marine environments. Around 10 km to the north, in the Gaimukh area, signs of intermediate diorite plutonic activity have been identified, along with rhyolitic lava flows near Dongri-Utan, as reported by Sheth and Pande (2014).

In central SGNP, a thick layer of volcaniclastic rock can be seen on scattered hills, lying above the Borivali pillow lavas. The volcaniclastic material near Kanheri Caves shows a wide range of chemical compositions, including variations in silica (51.7–61.4%), iron oxide (9.7–18.09%), magnesium oxide (0.30–6.66%), aluminum oxide (9.7–15.5%), titanium dioxide (0.7–2.6%), chromium (23–51 ppm), and nickel (32–137 ppm). These differences are due to varying proportions of the matrix and basalt clasts within the rock.

The soil cover in the Sanjay Gandhi National Park (SGNP) is predominantly alluvial and loamy, with shallow to medium soil depth.

Table 3.11 Details of Soil within SGNP

Sl. No.	Parameters	Core area	Non-core area
1	Soil pH	6.5	7.5
2	Organic Carbon	>0.75%	<0.50%
3	Ammoniacal Nitrogen	>50(high)	20 – 30 (medium)
4	Nitrate Nitrogen	5-10(medium)	5-10 (medium)
5	Phosphorus (P2Os)	25 to 40(high)	10-25 (medium)
6	Potassium (K2O)	120-180 kg/acre (high)	60-120 kg/acre (medium)

Source: Forest Management Plan, SGNP, 2024-25 to 2033-34

The soil type extends beyond the SGNP into the ESZ as seen in Figure 3.3

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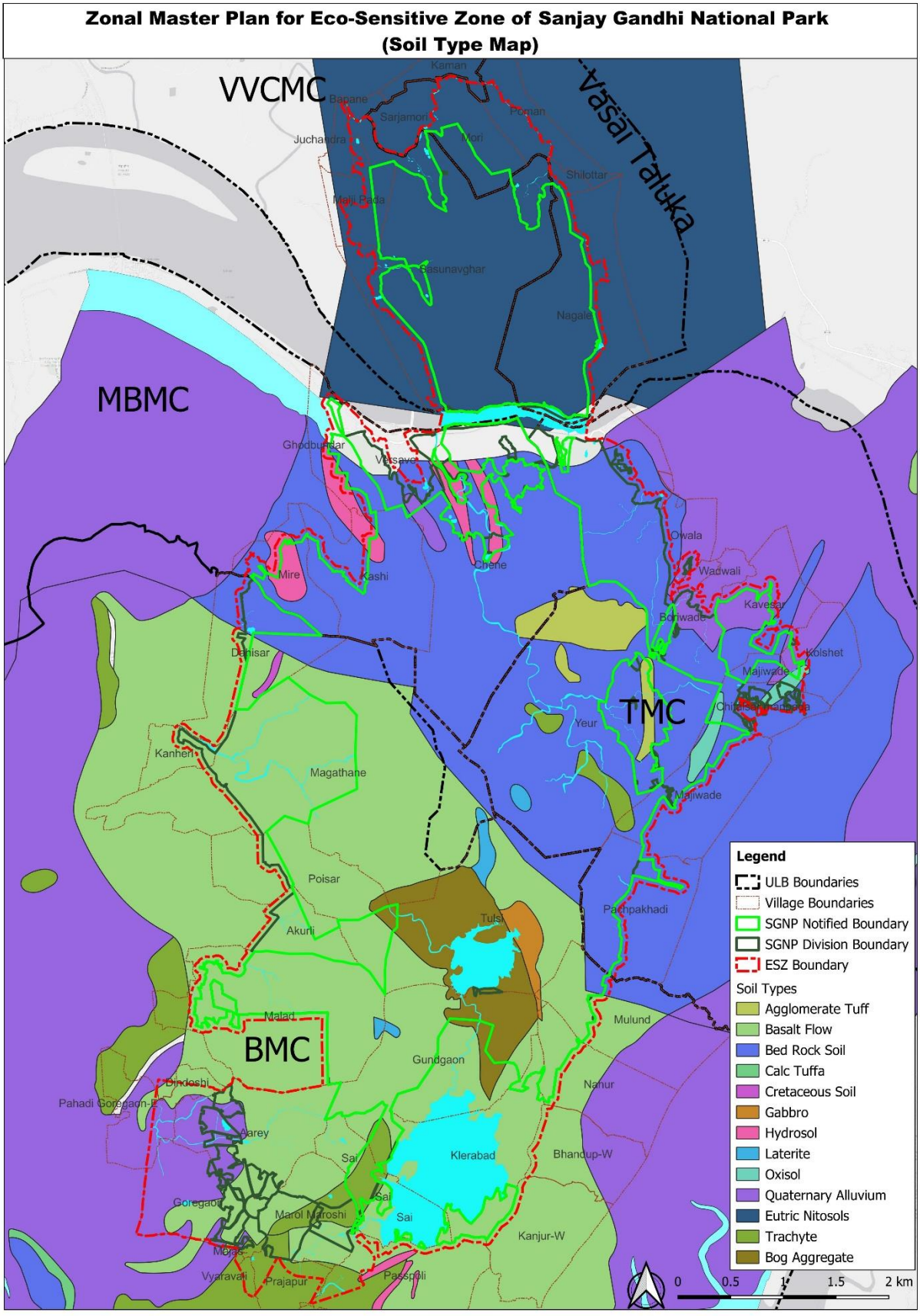
Figure 3.3: Geology – Soil Type of the SGNP and its ESZ



Source: Geological Survey of India

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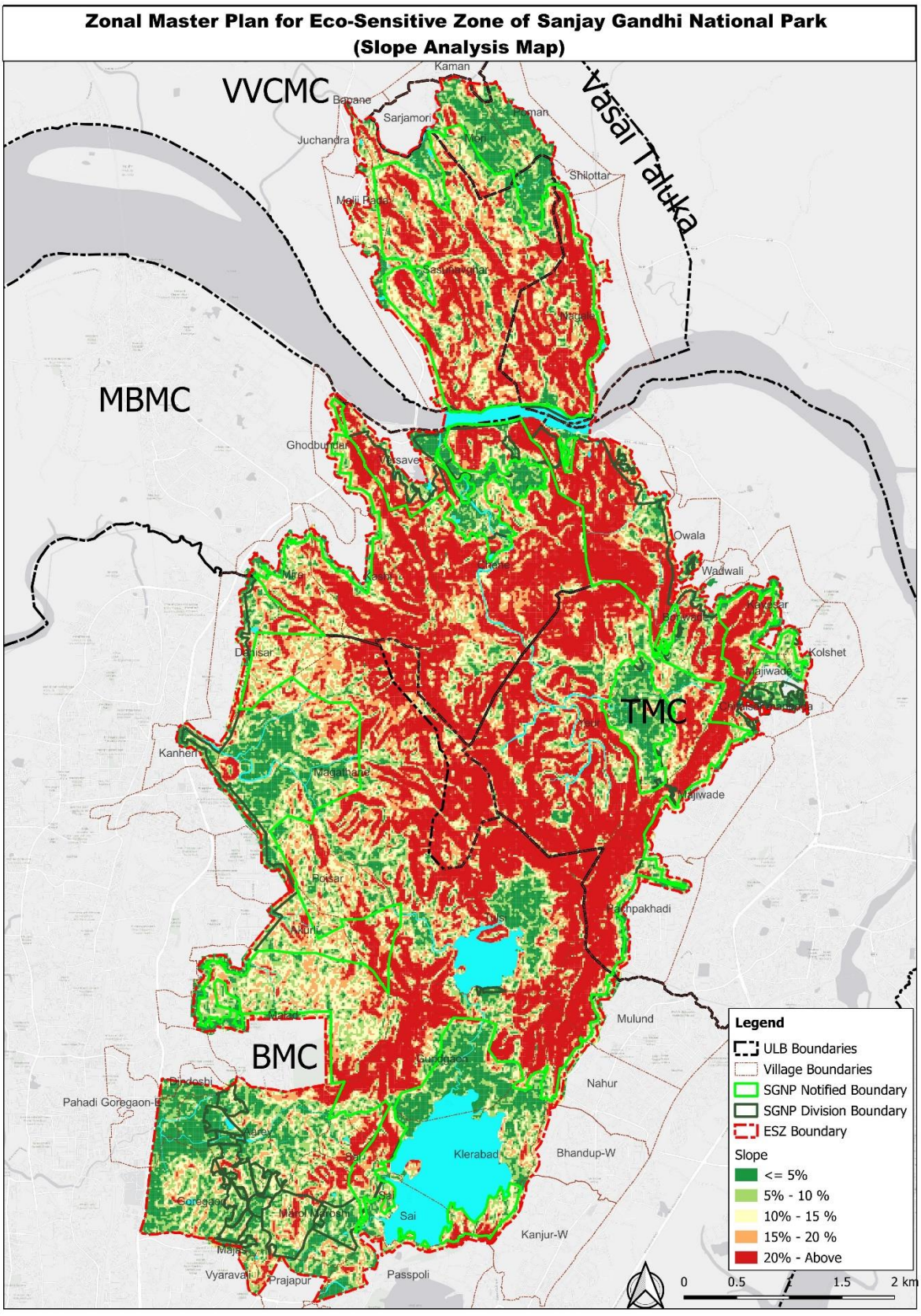
Figure 3.4: Slope of SGNP and ESZ



Source: Consultant Analysis

Only a thin mantle of soil covers the volcanic rocks underlying the region particulary on the ridges and other places where years of erosion have steadily worn it away. In some places, failry large areas of the hard, dry rocks are completely exposed as at Kanheri caves and their vicinity. On the tree clad lower slopes of Vihar and Tulsi catchment area, a good part of Chene Private Forests and Nagla Block, the soil is sufficiently deep and fertile.

3.6.1.4 Disaster prone area within ESZ

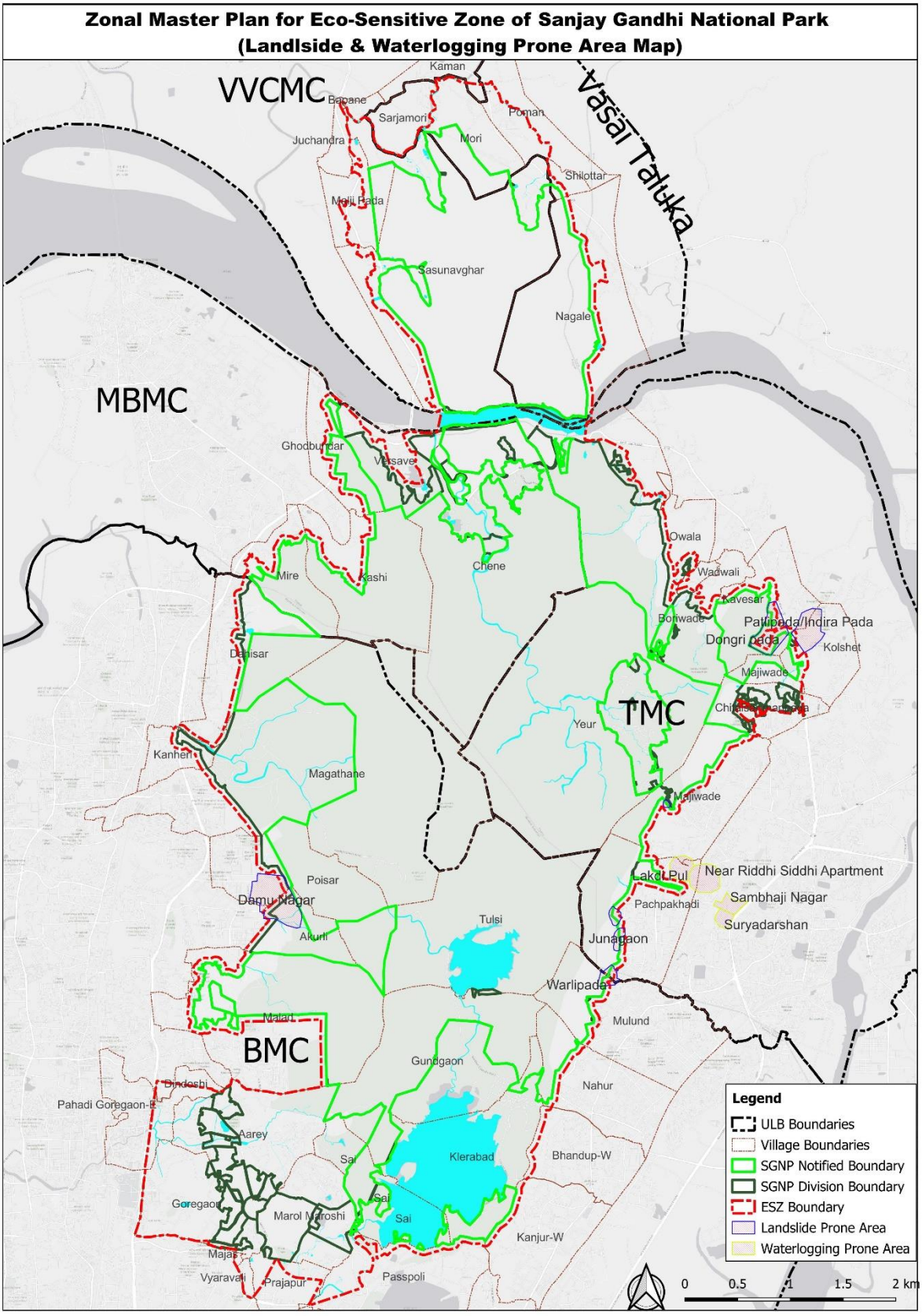
Disaster-prone areas located near the eco-sensitive zones (ESZs) of National Parks pose a serious threat to biodiversity and ecological stability. Natural hazards such as floods, landslides, forest fires, and cyclones can severely disrupt fragile ecosystems, leading to habitat destruction, loss of flora and fauna, and increased human-wildlife conflict. Such disasters can also introduce invasive species and degrade water and soil quality, further weakening the resilience of these ecosystems. As eco-sensitive zones serve as buffer areas to shield National Parks from anthropogenic pressures, it is crucial to integrate disaster risk management with conservation planning to ensure long-term ecological sustainability.

Table 3.12 List of disaster prone areas within ESZ

Disaster		Landslide prone areas	Water logging prone area
BMC		Damu Nagar Kandivali	-
TMC	Wagle Estate Prabhag Samiti	Warlipada	-
		Kailash Nagar	-
		Junagaon	-
		Ramnagar	-
	Vartak Nagar Prabhag Samiti	Near Gurudev Ashram, Upvan	-
	Majiwada Manpada Prabhag Samiti	Samtanagar/Indirapada	Juna Waghbil Gaon
		Patlipada	Valvi pada
		Dongaripada	
	Lokmanya Sawarkar Prabhag Samiti	-	Sambhaji nagar/Ramchandra nagar
		-	Kalika prasad chawl, Suryadarshan tower
		-	Lakdi Pul
		-	Shivaji Galli
		-	Riddhi Siddhi Apartment

Source: Mumbai Fire Brigade and Thane Disaster Cell

Figure 3.5 Landslide and Waterlogging prone areas within ESZ



Source: BMC, Mumbai Fire Brigade and Thane Disaster Cell

3.6.2 Climatology

The climate in ESZ of SGNP is characterized by an oppressive summer, dampness in the atmosphere nearly throughout the year, and heavy southwest monsoon rainfall. The cold season from December to February is followed by the summer season from March to June. The period from June to about the end of September constitutes the southwest monsoon season. October and November form the post monsoon season.

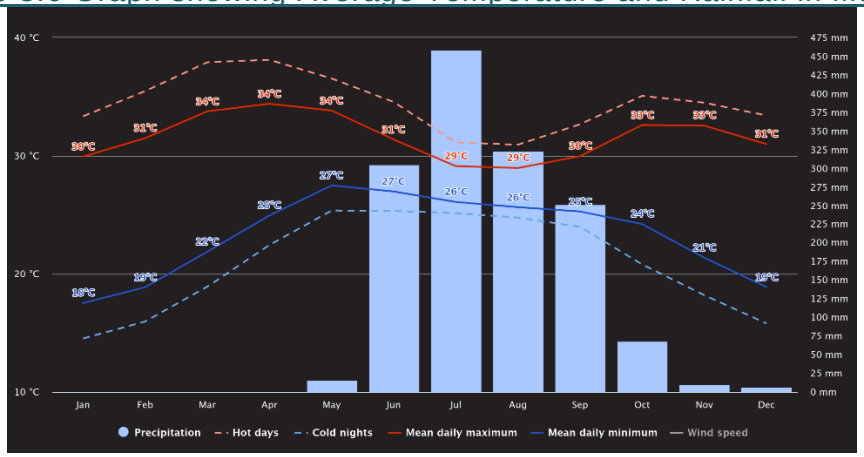
3.6.2.1 Temperature

After February there is a steady increase in temperature till May which is generally the hottest month. The mean daily maximum temperature in May is 33.3^{0}C and minimum temperature in May is 26.9^{0}C. Due to prevailing high humidity, the weather during summer is very oppressive. On certain days, the maximum temperature may occasionally go up to 40^{0}C. After the onset of the monsoon by about beginning of June, the weather becomes progressively cooler. But, towards the end of the southwest monsoon season, day temperature begins to increase slightly and a secondary maximum in day temperature is reached in November. Nights, however, become progressively cooler after the withdrawal of the monsoon. After November the day temperature also begins to decrease. January is generally the coldest month when mean daily maximum temperature is 29.1^{0}C; and minimum temperature is 19.4^{0}C. In the cold season, the minimum temperature occasionally drops down to about 10^{0}C. The highest maximum temperature recorded was 40.6^{0}C in 1955. The lowest minimum temperature recorded was 7.4^{0}C in 1962.

3.6.2.2 Rainfall

The average annual rainfall is about 2000 mm. The variation in the rainfall from year to year is quite appreciable. The highest annual rainfall was 167% of the annual normal, which occurred in 1917, whilst the lowest was only 51% of the normal, which occurred in 1905. About 94 per cent of the annual rainfall is received during the southwest monsoon from June to September. July is the rainiest month when about one third of the annual rainfall is received. Some rainfall mostly as thundershowers is also received during May and in the post monsoon months. During the period December to April there is very little rainfall. On an average there are 73 rainy days in a year (i.e. days with rainfall of 2.5 mm or more in a day).

Figure 3.6 Graph showing Average Temperature and Rainfall in Mumbai



Source: Meteoblue.com

3.6.2.3 Humidity

During June to September the relative humidity is above 75 per cent. The driest part of the year is during the period November to March with relative humidity between 50 and 65 per cent in the ESZ and SGNP area.

Figure 3.7: SGNP during Peak Monsoon Period

Source: Field Survey, Consultant

3.6.2.4 Cloudiness

During the southwest monsoon months, the sky is generally overcast. Cloudiness decreases after the withdrawal of the southwest monsoon towards the end of September. During the period December to march, normally clear or lightly clouded skies prevail. Later cloudiness increases with the progress of the season.

3.6.2.5 Wind Speed

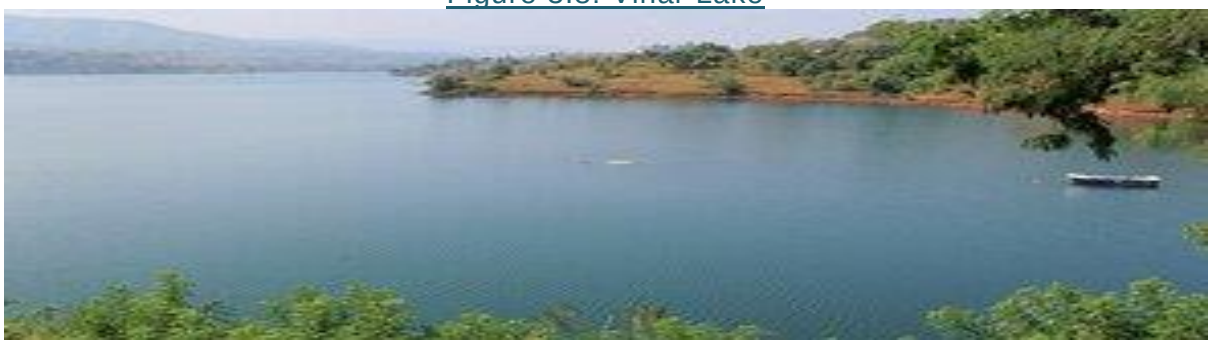
Winds are generally moderate with appreciable increase in force during the monsoon month. Winds during May and the southwest monsoon season are mainly from directions between southwest and northwest. For the rest of the year, winds blow from directions between north and east in the mornings and between west and north in the afternoons.

3.6.3 Water Bodies

3.6.3.1 Lakes

Tulsi and Vihar Lakes are the two major water impoundments located within the Sanjay Gandhi National Park that supply water to Mumbai and Thane cities. Out of the two, Vihar Lake is falls within the Eco-Sensitive Zone of Sanjay Gandhi National Park. Though these two lakes are geographically situated within the National Park, their water spread areas are not included in the national park and it belongs to the BMC. Only the catchments of these two lakes are part of the SGNP. Vihar Lake is situated at the extreme south of SGNP ESZ and has a water spread of about 731.492 hectares. The catchment of Vihar Lake is roughly 851.488 hectares. The catchment area of 366 hectare is under the management of the National Park whilst the basin of the lake and the rest of the catchment is under the control of the Brihanmumbai Municipal Corporation.

Figure 3.8: Vihar Lake



Source: Field Survey, Consultant

In addition to Vihar Lake, Upvan Lake (part) located in Yeoor Range and Dahisar Lake located in Krishnagiri Range are the other two lakes within the ESZ boundary. Upvan Lake is one of the biggest lakes in Thane surrounded by Yeoor Hills and is one of the primary points of recreation in Thane city.

Figure 3.9: Tulsi Lake

Source: Field Survey, Consultant

Figure 3.10: Dahisar Lake

Source: Field Survey, Consultant

It features hilly terrain with elevations from 30 to 400 meters and experiences a tropical monsoon climate. It includes several small watersheds that drain into Vasai Creek, and rivers like Mithi, Oshiwara, Dahisar and Laxmi flows through SGNP and ESZ. The Park exhibits radial and dendritic drainage patterns due to its undulating

terrain. These patterns help distribute rainwater through natural streams and valleys, forming the foundation of Mumbai's urban hydrology. Seasonal streams and nalas contribute to the catchment of lakes and downstream drainage, playing a key role in stormwater management and ecology. These watersheds originate in the forested hills and flow seasonally, especially during the monsoon.

Watershed plan of the ESZ of Sanjay Gandhi National Park encompasses 5 orders of streams within it. Each stream order in SGNP contributes to **water storage, biodiversity, and sediment control**. Protecting lower-order streams is vital, as they maintain the health and function of the entire hydrological network.

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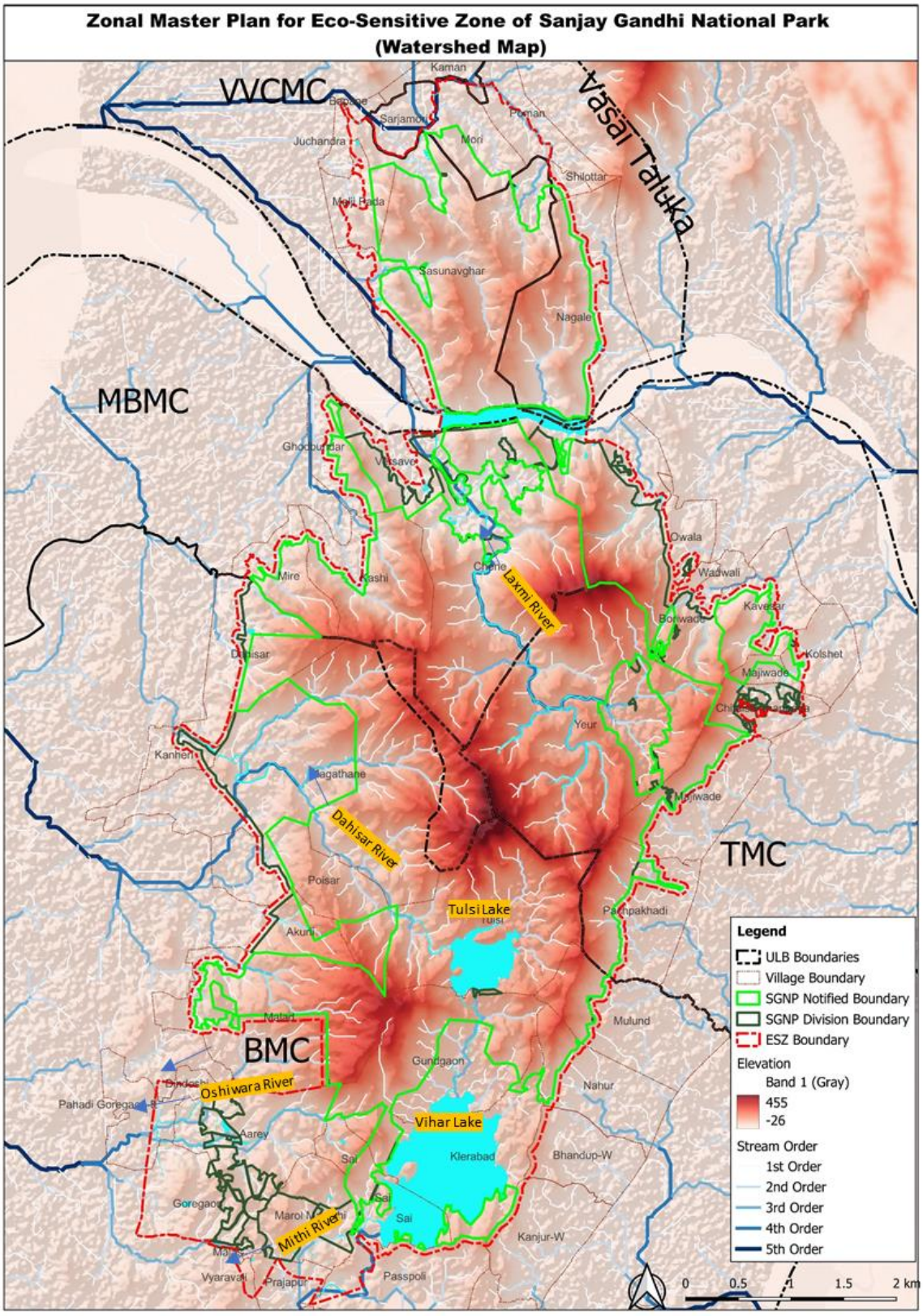
Figure 3.11: Watershed for the SGNP and ESZ



Source: Consultant Analysis

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3.6.3.2 Waterholes & Streams

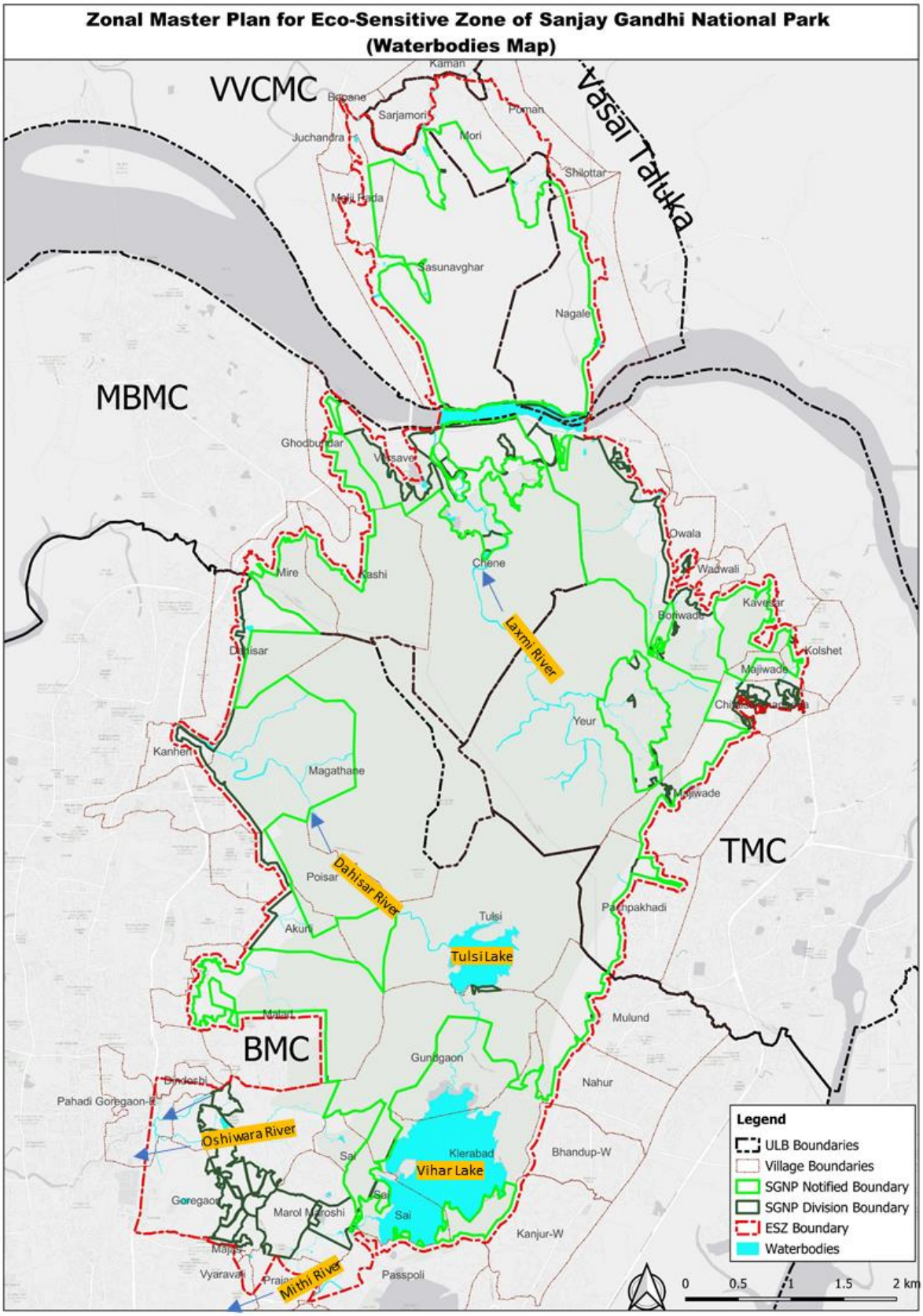
Vasai Creek (previously known as Bassein Creek) that flows in East-West direction divides the SGNP Division area unequally into the northern and the southern blocks. The main sources of water in the park are the rain-fed lakes - Tulsi and Vihar, the river Dahisar, Revat stream and numerous forest streams. The river Dahisar originates from Tulsi Lake and flows through the forest of Magathane village and joins Manori Creek to the northwest of Dahisar village. Very few perennial water springs or waterholes are seen in the beds of the Dahisar River and its tributaries. The Revat stream starts from Avaghada Hill. It then flows towards north through the reserved forests of Yeoor village and then through the reserved forests of Chene village and ultimately joins the Bassein creek (Ulhas River). The stream however is not perennial. There are a number of spots in this stream-bed, which can be developed as perennial waterholes. Mithi River originates from Vihar Lake, and flows westwards out of the National Park and then into the Arabian Sea.

Table 3.13 Table showing details of waterbodies in SGNP and ESZ

Waterbody	Type	Length/Area in ESZ	Perenniality	Use	Flow direction
SGNP					
Tulsi	Lake	139 Ha	Perennial	Drinking water supply	-
Eco Sensitive Zone					
Vihar	Lake	731 Ha	Perennial	Drinking water supply	-
Dahisar	River	4.7 Km	Seasonal	Natural drainage and flood management	Westward
Oshiwara	River	1.53 Km	Seasonal	Natural drainage and flood management	Westward
Mithi	River	2.18 Km	Seasonal	Natural drainage and flood management	Southward
Laxmi/Revat	River	11.38 Km	Seasonal	Natural drainage and flood management	Northward

Source: Consultant Analysis

Figure 3.12 Waterbodies map of SGNP ESZ



Source: Consultant Analysis

3.6.3.3 Current challenges of waterbodies

1. Pollution and contamination - Illegal settlements near the park contribute to domestic sewage entering the waterbodies. Nearby urban areas generate waste that sometimes finds its way into lakes and streams. Nutrient pollution leads to excessive algal growth, reducing oxygen levels and harming aquatic life.
2. Encroachments - Human settlements near SGNP encroach on buffer zones, leading to deforestation and degradation of catchment areas. Urbanization around Borivali, Dahisar, and Mulund exerts pressure on SGNP's water resources.
3. Loss of biodiversity - Pollution and human activity reduce fish and bird populations around waterbodies. Urban expansion threatens mangroves and marshlands near SGNP, affecting water retention.

3.7 Corridors & Connecting Forests

Sanjay Gandhi National Park is an island ecosystem with connected forest in the north through active wildlife corridors. It is sandwiched between the two ever growing cities of Mumbai and Thane in such a way that human habitation totally engulfs it. In such an ecosystem, corridors and connecting forests play a vital role. Due to the lack of a buffer zone, the animals of SGNP are perpetually faced with a threat.

Figure 3.13: Vasai Creek, Nagla SGNP

Corridors are particularly important as they allow the movement of animals from one environment to another. This movement enlarges the animals' range and habitat and therefore, helps to increase their genetic diversity and health. This in turn means that corridors are extremely important for the survival of a healthy population of species. Vasai creek/Ulhas river is used as a corridor for animals to navigate across SGNP.

The national park is engulfed on three sides by the 2 mega cities. The only opening is towards the north at the Bassein Creek. Beyond the creek is the northern block (Nagla) and the lush forests of Tungareshwar. Tungareshwar is also declared as a wildlife sanctuary. From north of Nagla Block, corridors are been used by the animals to reach Tungareshwar.

3.7.1 Tungareshwar

Tungareshwar is a forest covered with deciduous patches and it has perennial water sources explaining the high densities of wildlife. Along with the high biodiversity potential, Tungareshwar also acts as a catchment area, which helps to recharge thousands of freshwater wells in the Vasai Taluka. This forest and the surrounding areas are vital for maintaining the water security of the entire region. Tungareshwar is naturally connected to Tansa. The northern block (Nagla) is in turn connected to Tungareshwar. It is necessary to maintain this natural corridor to ensure the survival of the species within them.

3.7.2 Thane Creek Flamingo Sanctuary

Thane Creek Flamingo Sanctuary, located along the western bank of Thane Creek near Airoli and Vashi, is India's first flamingo sanctuary within a metropolitan region. Spread over 1,690 hectares, it comprises mangroves and mudflats that support rich biodiversity including over 167 bird species, 12 mangrove species, fish, crustaceans, and insects. Notably, it hosts thousands of Greater and Lesser flamingos from October to May and was designated a Ramsar site in 2022 for its ecological importance. This urban wetland plays a vital role in conserving migratory species along the Central Asian Flyway.

3.7.3 Karnala Bird Sanctuary

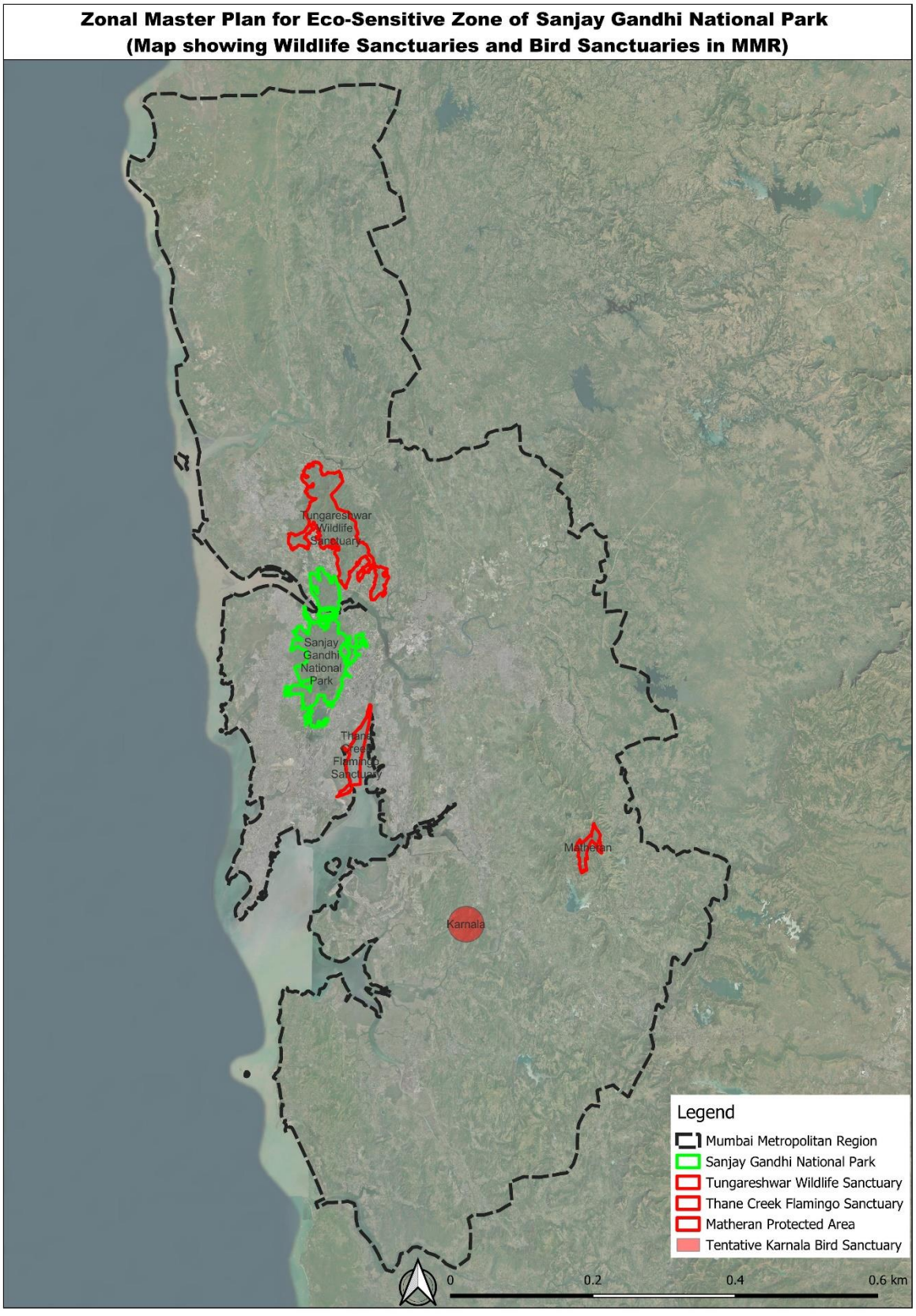
Karnala Bird Sanctuary, near Panvel in Raigad, is a biodiversity-rich 12.11 sq. km wildlife reserve in the Western Ghats. Home to 222+ bird species, including the Malabar Whistling Thrush and endangered Ashy Minivet, it also shelters leopards, wild boars, and langurs in its moist deciduous forests. The historic Karnala Fort, a popular trek, offers scenic views. However, urban expansion, deforestation, and human activity threaten its ecosystem. Conservation efforts, like eco-sensitive regulations and afforestation, aim to preserve this vital habitat.

3.7.4 Matheran

Matheran, a hill station in Raigad district, is a notified Eco-Sensitive Zone (ESZ) covering 214.73 sq. km to protect its unique biodiversity. Situated in the Western Ghats, it is home to evergreen forests, diverse bird species, butterflies, and mammals like leopards, deer, and wild boars. The area is known for its pollution-free environment, as vehicles are banned, preserving its fragile ecosystem. However, deforestation, unregulated tourism, and encroachments threaten its ecological balance. Strict regulations under the Maharashtra government’s ESZ policy aim to conserve its rich flora and fauna while allowing sustainable tourism.

Some of the major wildlife corridors that are present across these wildlife areas are SGNP-Tungareshwar Wildlife corridor, SGNP-Yeeor Hills corridor, Karnala Bird Sanctuary-Matheran Eco-Sensitive Zone corridor, Tungareshwar-Tansa Wildlife Corridor, Matheran-Bhimashankar Wildlife corridor.

Figure 3.14 Wildlife sanctuary and Bird sanctuary in MMR region



Source: Consultant Analysis

4 BIODIVERSITY OF ESZ

Biodiversity is a fundamental component of ecological sustainability, playing a crucial role in maintaining ecosystem balance and supporting human well-being. The assessment of biodiversity within the study area provides valuable insights into the richness of flora and fauna, ecosystem functions, and potential conservation priorities.

This chapter presents the findings of a biodiversity survey conducted to document the variety of species, habitat conditions, and ecological significance of the area. The survey involved systematic data collection, including field observations, species identification, and habitat assessments, to evaluate the ecological health and diversity of the zone. By analysing key biodiversity indicators, the study aims to inform planning decisions, conservation strategies, and sustainable land-use management. The following sections detail the methodology of the survey, key findings on species diversity, habitat distribution etc.

4.1 Study Area Delineation

For the biodiversity survey and subsequent vulnerability assessment, the study area has been systematically divided into zones based on key ecological and urban parameters. A geo-referenced map of the Eco-Sensitive Zone (ESZ) was created, incorporating a grid system with each grid measuring 0.5m x 0.5m. This grid framework served as the basis for delineating survey zones, ensuring a structured approach to data collection and analysis.

The size of each zone was carefully determined, with the primary criterion being that no zone exceeds one hectare. The delineation was influenced by urban density, wherein higher-density areas were assigned smaller zones, while areas dominated by dense vegetation, indicative of lower urban density, were allocated larger zones. This methodology ensures an equitable distribution of survey zones, aligning with population density and urban characteristics.

Natural and infrastructural features were integral to zone delineation. Zones extend between roads and natural drainage systems, acknowledging their role as barriers affecting wildlife movement and human-animal interactions. These features are critical points of potential conflict and serve as natural boundaries for the survey. Additionally, urban zones were confined within village boundaries to maintain administrative clarity and prevent overlap between villages.

A total of 219 zones were established to comprehensively cover the ESZ. Each zone will be subjected to a detailed assessment, leveraging data collected on a zone-by-zone basis to support biodiversity analysis and conservation planning.

4.2 Survey Methodology

The biodiversity survey was meticulously designed, considering the unique characteristics of the study area and the allocated timeframe. A dedicated team of field biologists and specialists was assembled to ensure seamless execution. The planning phase involved an in-depth evaluation of various data collection

methodologies, including Transect Sampling, Quadrant Sampling, and Randomized Sampling. After thorough assessment, Randomized Sampling was selected as the most suitable methodology, offering comprehensive and representative insights into the biodiversity of the study area.

Data collection methodologies varied based on the survey's purpose and the type of flora and fauna present. The survey, conducted in 2021–2022, played a crucial role in understanding and protecting the natural habitat within the SGNP ESZ. Field surveys were conducted on-site, with each grid systematically assessed. Applications such as 'Map Marker' and 'GPS Map Camera' were utilized to locate species on the map, which was later superimposed as layers in the Earth application for categorizing eco-sensitive zones.

Prior to the field survey, preparatory tasks were undertaken, including:

- Obtaining necessary permits and permissions from relevant authorities, including Aarey Milk Colony, Film City Area, Filter Pada, Adarsh Nagar, Peru Baug, Hill Crest Society Area-JVLR, Passpoli-Goregaon, and Poman Village.
- Procuring essential field equipment, including binoculars (Olympus 10x40), GPS receivers (Garmin Map 76), digital cameras (Canon 60D) with a 300mm zoom lens, field guidebooks for species identification, and notebooks for field documentation.
- Developing a comprehensive list of parameters for flora and fauna data collection.

It has to be noted that the survey is done using trail method where trails are followed and visibility of 25m was available. Details are primarily based on the details captured using these trails and visibility of 25m on both the sides of the trail.

Survey zones were created based on the accessibility across natural features within the ESZ area.

This systematic approach ensures accuracy and reliability in biodiversity assessment, supporting conservation efforts within the eco-sensitive zone.

4.3 Biodiversity Assessment Parameters

A structured checklist was developed to document flora and fauna observed during the survey. The following parameters were recorded to facilitate comprehensive analysis and conservation planning:

- Zone Number: Each recorded observation was linked to a predefined grid, aiding in data compilation and identifying high-impact zones.
- Common/Local Name: Local nomenclature was recorded for easier species identification and community engagement.
- Species Type (Annual/Seasonal): Understanding seasonality helps assess species presence, resource availability, and ecosystem dynamics.
- Dispersal Distance: Insights into species dispersal patterns inform habitat connectivity, ecosystem health, and potential threats from invasive species.

- Count of Species: The abundance of flora and fauna provides key indicators of biodiversity richness and ecosystem stability.
- Species Location: Recording precise locations aids in understanding migration patterns, habitat suitability, and human-induced environmental impacts.
- Age Category (Juvenile/Adult/Heritage Tree): Trees with a minimum girth of 10 cm at chest height and 3m in height were included in the survey, ensuring a comprehensive inventory.
- Species Health (Healthy/Unhealthy/Irrecoverable): The condition of flora was assessed to identify environmental stressors, habitat degradation, and conservation priorities.
- Age and Health Parameters: The distribution of healthy and unhealthy species provides insights into ecosystem stability, resilience, and areas needing intervention.

Table 4.1: Checklist for assessment of Flora & Fauna

Zone Number	
Flora / Fauna	
Characteristics	Common Name/Local Name Species Type (Annual/ Seasonal) Species Name
Abundance of Species	Dispersal Distance (Extent of Habitat of Species Count of Species
Locational Parameters	Species Location Area
Age Health Parameter	Life Expectancy Age (Juvenile/ Adult/ Heritage tree) Girth Size Height
Remarks	

Source: Consultant Analysis

The recorded data was systematically compiled in an Excel sheet for further analysis, including the classification of human animal conflict zones. These parameters contribute to understanding biodiversity trends, supporting conservation strategies, and informing policy decisions for sustainable ecosystem management.

4.4 Limitations of Survey

The biodiversity survey was conducted in accordance with site conditions; however, several challenges were encountered that impacted the accuracy and efficiency of data collection. The biodiversity survey was conducted in accordance with site conditions; however, several challenges were encountered that impacted the accuracy and efficiency of data collection.

Accurately identifying and classifying species was a significant challenge, particularly for cryptic species, morphologically similar species, and those with limited existing research. These identification difficulties affected the precision of species documentation and analysis. Survey site constraints also posed considerable challenges. Conducting surveys in biodiversity hotspots, characterized by

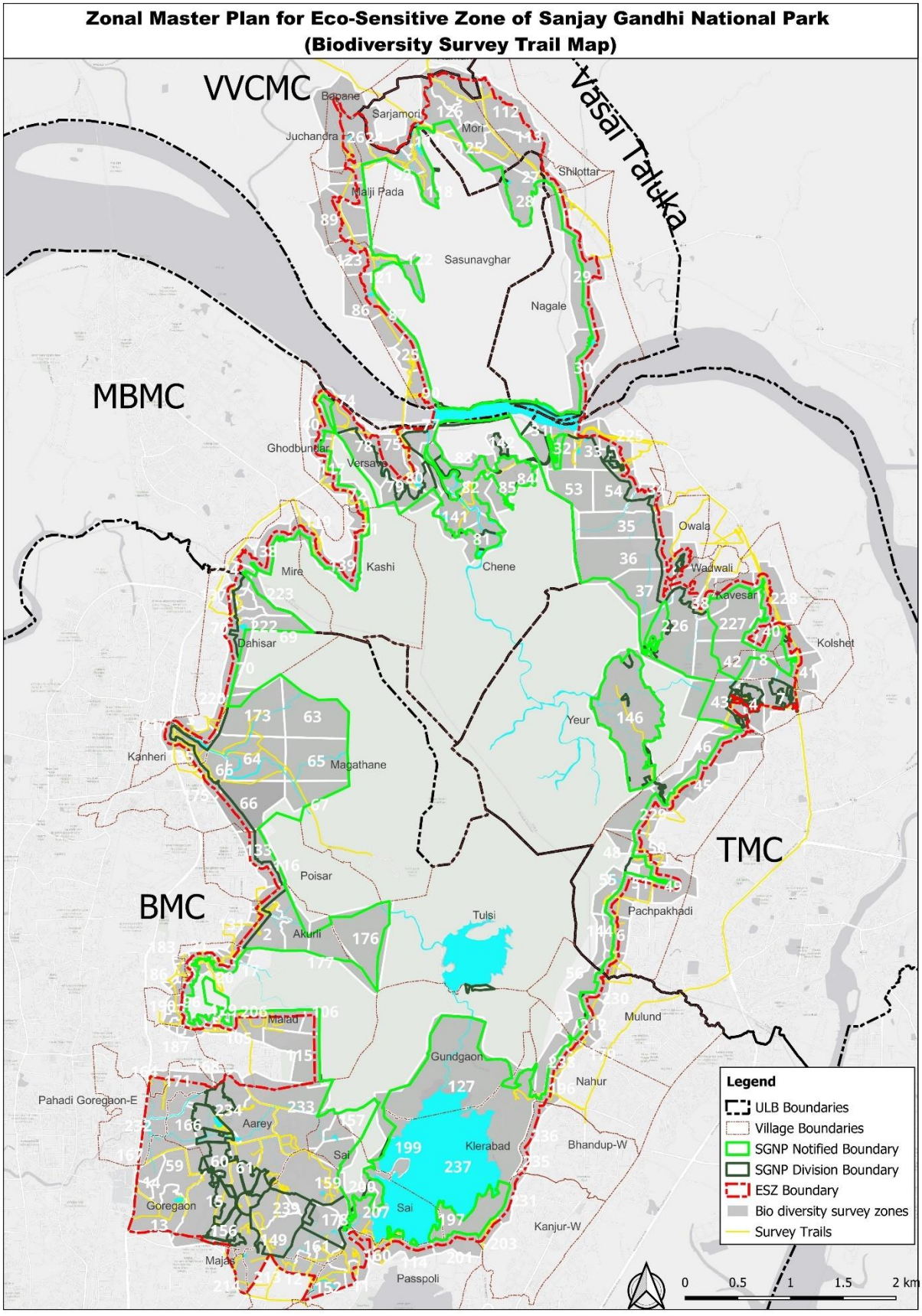
exceptionally high species richness and dense vegetation, made species identification and enumeration more difficult. Additionally, accessibility was a major issue, as some areas were difficult to reach due to rugged terrain, extreme weather conditions, and limited infrastructure.

Safety concerns further complicated the survey process. Surveys in regions such as Aarey Forest, known for potentially dangerous wildlife, posed risks to researchers. Additionally, areas with security concerns, such as Appapada, presented significant safety challenges due to high crime rates and political instability, making fieldwork hazardous. Regulatory barriers and permit restrictions also affected the survey. Despite obtaining prior permits, access to certain sites was denied, leading to delays. Restricted entry was encountered in locations such as Ram Prasad Chawl (Shivaji Nagar, Kurar Village), Hanuman Pada (Mulund-West), and Naigaon-Sasunavghar (Vasai-Virar) due to expired police permission letters and ID cards. Despite these challenges, efforts were made to mitigate limitations through adaptive methodologies and multiple survey techniques to ensure robust biodiversity assessments.

4.5 Survey Observations

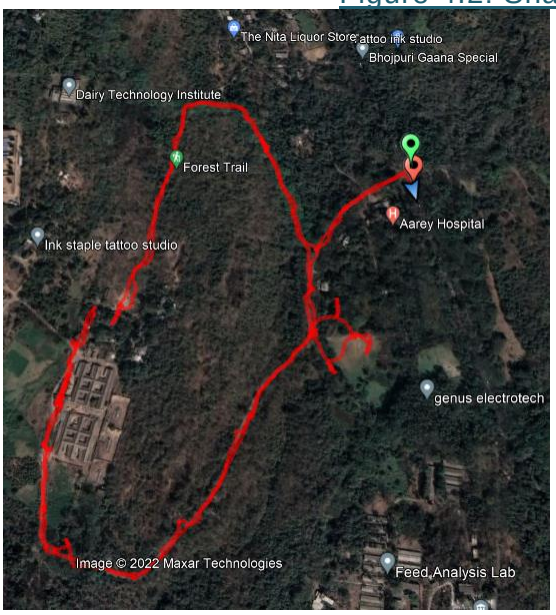
Different climatic conditions influence the presence of flora and fauna, making it essential to monitor biodiversity periodically. The survey was strategically scheduled to maximize species observation, with data collection undertaken during both pre-monsoon and post-monsoon periods. Trails covered each grid systematically, during Morning to Afternoon with data recorded using the 'My Tracks' application through visual observation and photographic documentation.

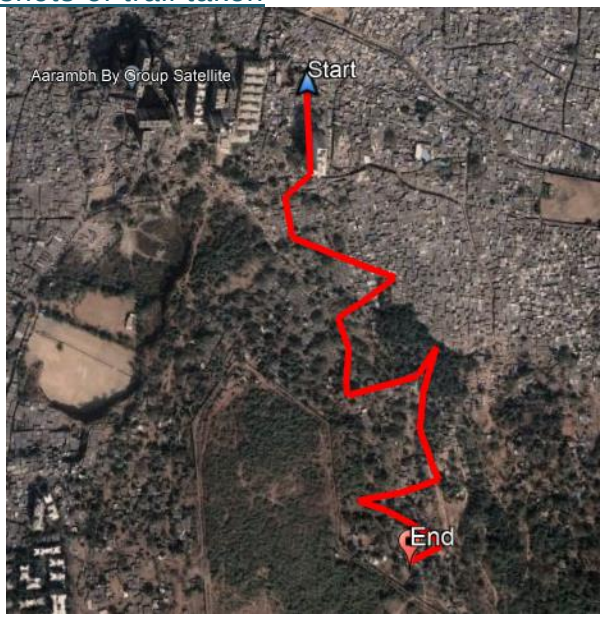
Figure 4.1: Visually Covered area during trails



Source: Consultant Analysis

Figure 4.2: Snapshots of trail taken





The list of Flora found in pre monsoon survey and post ,monsoon is given in Annexure IV.Few flora species mostly common that were found during pre and post monsoon survey in ESZ are shown in pictures below.

Flora	Details
	Scientific Name: Albizia chinensis Common Name: Pharadi Habitat & Distribution: Native to South and Southeast Asia; thrives in tropical forests, grasslands, and along riverbanks. Description: Albizia chinensis is a fast-growing deciduous tree, reaching 15–30 m height, with a broad canopy and bipinnate leaves.
	Scientific Name: Cocos nucifera Common Name: Coconut Palm Habitat & Distribution: Native to coastal Melanesia and Southeast Asia, including Malaysia, Indonesia, the Philippines, and Papua New Guinea. Description: A tall palm reaching 30m, with pinnate leaves (4–6m) and smooth trunks. The fruit is the coconut. Flowers are polygamomonoecious, with both male and female flowers in the same inflorescence, flowering continuously.

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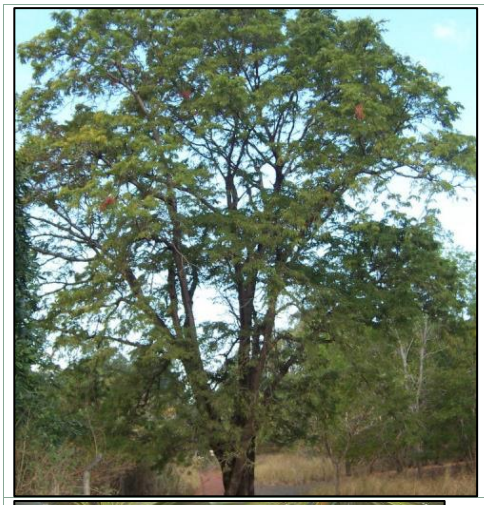	Scientific Name: Tamarindus indica Common Name: Chinch Habitat & Distribution: Native to tropical Africa, widely cultivated across South Asia; thrives in semi-arid to humid regions, often in dry deciduous forests. Description: Tamarindus indica is a slow-growing, long-lived tree reaching 12–18 m height, with a dense crown, feathery pinnate leaves, yellowish flowers, and curved brown pods containing tangy, edible pulp.
	Scientific Name: Borassus flabellifer Common Name: Palmyra palm Habitat & Distribution: native to South and Southeast Asia; commonly found in coastal regions, dry plains, and agricultural lands; thrives in arid to semi-arid tropical climates. Description: Borassus flabellifer is a tall, robust palm reaching 20–30 m in height, with a straight trunk, large fan-shaped leaves, and bears sweet edible fruits, sap, and strong fibrous wood.
	Scientific Name: Ficus benghalensis Common Name: Banyan Fig, Indian Banyan Habitat & Distribution: Grows in monsoon and rainforests up to 600m but is drought-resistant and tolerates mild frost. Description: A large, fast-growing evergreen tree, widely introduced in tropical and subtropical regions, naturalized in both natural and disturbed areas.
	Scientific Name: Mangifera indica Common Name: Mango Tree Habitat & Distribution: Found along riverbanks and in homesteads across India, Myanmar, Thailand, Indo-China, and Malesia. Description: A large evergreen tree with oblong or elliptic-lanceolate leaves. Terminal panicles bear uni- or bisexual creamy-white flowers. The fruit is an ovoid-oblong drupe.

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	Scientific Name: Peltophorum pterocarpum Common Name: Copper Pod Habitat & Distribution: Native to tropical Southeast Asia and northern Australasia, including Australia, Sri Lanka, Indonesia, Malaysia, Papua New Guinea, the Philippines, Thailand, Vietnam, and India. Description: A deciduous tree growing 15–25m (rarely 50m) tall with a 1m trunk diameter. Leaves are bipinnate (30–60 cm) with 16–20 pinnae, each having 20–40 oval leaflets. Yellow flowers (2.5–4 cm) bloom in large racemes (up to 20 cm) after about four years.
	Scientific Name: Syzygium cumini Common Name: Jamun Habitat & Distribution: Found in shoals, riverbanks, and scrub, also planted as avenue trees up to 1400m. Native to the Indian subcontinent, Southeast Asia, and Australia. Description: A fast-growing tree reaching 30m and living over 100 years. It has dense foliage for shade, rough dark grey bark at the base, and smoother light grey bark higher up. Its kiln-dried wood is water-resistant.
	Scientific Name: Tectona grandis Common Name: Teak Habitat & Distribution: Tectona grandis (Teak) is native to South and Southeast Asia, thriving in mixed deciduous forests with well-drained soils, mainly found in India, Myanmar, Thailand, and parts of Indonesia and Laos. Description: Tectona grandis is a large deciduous tree reaching 30–40 m tall, with a straight trunk, large ovate leaves, and valuable durable hardwood prized for furniture and construction.

The list of Fauna found in Pre-Monsoon survey and Post Monsoon survey is given in Annexure V. Pictures of Fauna found in ESZ during Pre and post monsoon survey are as follows:

Fauna	Details
	Scientific Name: Ardea intermedia Common Name: Intermediate Egret (Medium Egret) Habitat & Distribution: Ardea intermedia, the Intermediate Egret, inhabits freshwater wetlands, marshes, and shallow lakes across Asia, Africa, and Australia, favoring tropical and subtropical regions with abundant aquatic vegetation and fish. Description: Intermediate Egret is a medium white heron, 60–70 cm tall, with slender neck, yellow bill, and black legs and feet..
	Scientific Name: Macaca mulata Common Name: Rhesus Macaque Habitat & Distribution: Macaca mulata, the Rhesus Macaque, inhabits diverse habitats including forests, grasslands, and urban areas across South, Central, and Southeast Asia, especially India, Nepal, Bangladesh, and parts of China. Description: medium-sized monkey, 40–60 cm long (excluding tail), with brownish-gray fur, expressive face, and adaptable behavior in diverse environments.
	Scientific Name: Columba livia Common Name: Rock Pigeon (Blue Rock Pigeon) Habitat & Distribution: Columba livia, the Rock Pigeon, is found worldwide, inhabiting urban areas, cliffs, and farmlands, originally native to Europe, North Africa, and South Asia. Description: Rock Pigeon is a medium-sized bird, 30–35 cm long, with bluish-gray plumage, iridescent neck feathers, and strong flight; commonly seen in cities and towns.

	Scientific Name: Macaca radiata Common Name: Bonnet Macaque Habitat & Distribution: Macaca radiata, the Bonnet Macaque, is native to southern India, inhabiting forests, temple grounds, and urban areas; highly adaptable to both rural and urban environments. Description: medium-sized primate, 35–60 cm long, with a long tail, light brown fur, and distinctive hair whorl resembling a bonnet on its head.
	Scientific Name: Spilopelia chinensis Common Name: Spotted Dove Habitat & Distribution: inhabits open woodlands, gardens, and urban areas; a slender bird with brown body, spotted neck patch, and 28–32 cm in length. Description: medium-sized bird, 28–32 cm long, with a pinkish-brown body, white-spotted black collar, slender build, and soft, cooing calls.
	Scientific Name: Buprestidae Common Name: Jewel Beetle Habitat & Distribution: Found in forests, woodlands, and heaths, especially in the Sydney region. Larvae live in wood or plant stems, some feeding on dry leaves. Description: A family of glossy, iridescent beetles, also called metallic wood-boring beetles. Known as flatheaded borers in the larval stage. One of the largest beetle families, with 15,500 species in 775 genera and nearly 100 fossil species. They are cylindrical to ovoid, typically under 20 mm, but can reach up to 80 mm.
	Scientific Name: Dysdercus cingulatus Common Name: Red Cotton Stainer Habitat & Distribution: Found in Nepal, Sri Lanka, northeastern India, Bangladesh, Thailand, the Philippines, Sumatra, Borneo, Papua New Guinea, and northern Australia. Description: Grows 12–18 mm long, mainly red with a white collar and three black spots. Similar to Dysdercus koenigii but slightly larger, with partially black femora, unlike the completely red femora of D. koenigii.

	Scientific Name: Phalanta phalantha Common Name: Common Leopard Description: An orangish-yellow butterfly with a 50–60 mm wingspan. The bright orange upper wings have numerous black spots and streaks. Forewings feature brownish-black lines, discal spots, postdiscal lunules, a subterminal fine line, and terminal spots at vein apices.
	Scientific Name: Neptis hylas Common Name: Common Sailor Habitat & Distribution: Found across continental India, Sri Lanka, Assam, Nepal, Myanmar, China, and Indomalaya. Description: Dry-season form has a black upperside with pure white markings. Forewing has a club-shaped discoidal streak and distinct triangular spot. Hindwing has a subbasal band and postdiscal spots. Underside varies from pale to dark ochraceous with broader white markings outlined in black. Antennae, head, thorax, and abdomen are black, with dusky white palpi and underside.
	Scientific Name: Pareronia hippia Common Name: Indian Wanderer Habitat & Distribution: Found in Sri Lanka (ceylanica endemic) and diverse habitats like beach hinterlands, forest edges, parks, and gardens up to 500m. Description: Females resemble males but have more extensive dark brown areas. Hippia females have chalky greyish-white markings, while Valeria females have a yellow wing base, mimicking the toxic Parantica aspasia.

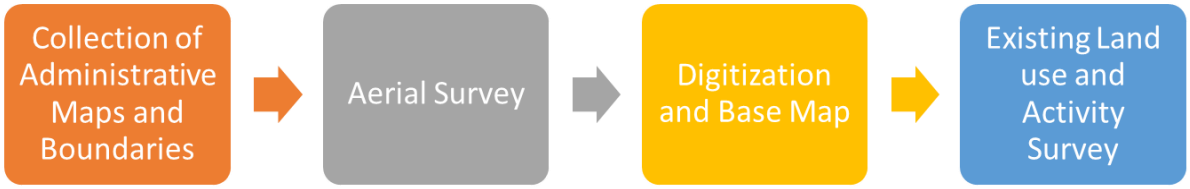
	Scientific Name: Argiope aemula Common Name: Oval Cross Spider Habitat & Distribution: Found near human settlements in open, dry environments. Vibrates or moves behind the web when disturbed. Description: Brownish cephalothorax with white pubescence, black-ringed posterior median eyes, and a heart-shaped sternum. Yellow abdomen with black stripes, brown ventral side with yellow lines. Spins a highly adhesive orb web with an X-shaped stabilimentum.

5 EXISTING LANDUSE, ACTIVITY & INFRASTRUCTURE IN ESZ

The Existing Landuse activites being carried out within the Eco Sensitive Zone of Sanjay Gandhi National Park, forms the very basis on which the analysis of the conflicts and issues, with respect to the ESZ notification 2016, is done, and actions/measures suggested in this report. The process of the preparation of the Existing Land Use includes the Aerial survey, Base map preparation and then carrying out a field survey to record the activities and land uses.

5.1 Base Map Preparation

Figure 5.1 Flowchart showing process of Existing Land use and Activity survey



5.1.1 Collection of Administrative Maps and Boundaries

In order to prepare the Existing Landuse map the Base map of the area was prepared using multiple source maps such as

- Notified Forest Maps of Sanjay Gandhi National Park,
- Notified Eco Sensitive Zone Map,
- Topographical Maps from Survey of India,
- Development Plans/Regional Plans of
    - Brihanmumbai Municipal Corporation,
    - Thane Municipal Corporation,
    - Mira Bhayender Municipal Corporation,
    - Vasai Virar City Municipal Corporation and
    - Mumbai Metropolitan Regional Plan
- Cadastral maps of all areas
    - Village Maps (BMC, MBMC, VVCMC, Vasai Taluka and TMC)
    - CTS Maps (BMC)

Administrative Boundaries were collected from the different ULBs that falls under the Eco-Sensitive Zone of Sanjay Gandhi National Park area. The same were then georeferenced and digitized to form the Area of Interest.

5.1.2 Aerial Survey

Aerial Drone Survey was conducted for the Area of Interest (AOI) for all areas where Drone flying permit was available and did not fall in restricted area. For restricted area available satellite images were used. The images were processed and stitched into an orthomosaic covering the study area. The Aerial image has a resolution of 3.5 cm, which allows every small detail to be visible for digitisation.

Figure 5.2: Sample excerpt of the Drone images captures during Aerial Drone Survey

Source: Consultant

5.1.3 Digitisation & Base map

All the features on the Drone images are digitised in the form of points, polygons and lines to depict the features visible on the image. The procedures for layering and symbol representation in this process adhered to the guidelines as per GR NO. TPS-1818/1489/ प्र.क.303/18/NV-13 dated 25.01.2019, Corrigendum to above GR dated 17.06.2019, published by the Directorate of Town Planning & Valuation Department.

Base Map are then checked on ground during Ground Truthing Exercise to make sure if any features are missing from the Draft Base Map. After ground truthing, all the existing available data layers and attributes were attached with updated GIS based base map for analysis of planning area. At the end of this step a final updated GIS base map was created for further use

5.1.4 Existing Land use and Activity Survey:

Land Use and Activity Mapping also done in conjunction with the Ground Truthing Survey. During the Existing Land use and Activities survey, the land uses and activities are captured at building level marking all the class and subclass. The data is collected using a handheld on field connected with the backend server. Three specific categories of features were collected from field

- First category Polygon features, included building footprints and water bodies, with attached forms containing questions regarding the land use of all floors, the total number of floors, basement floors, building height, locality, construction type, and any additional descriptions.
- Second category Line features data included features such as roads, rails, bridges, flyovers, water supply networks, storm water drainage, sewerage networks, power and natural gas infrastructure, with accompanying forms containing relevant questions.
- Third category Point features encompassed crucial features related to residential, commercial, public and semi-public areas, solid waste management, communication, transportation, water supply networks, stormwater drainage, sewerage networks, power infrastructure, and natural gas facilities.

The Existing Landuse is prepared through the process of field survey and is checked and verified by the ULB officials.

5.2 Existing Land use & Activities, ESZ

Table 5.1 Comparative Existing Landuse for all ULBs

	All areas in Ha					
Land use	**BMC**	**MBMC**	**VVCMC**	**Vasai Taluka**	**TMC**	**Entire ESZ[3]**
Residential Use	94.608	31.267	14.392	22.062	93.991	256.32
Slum Use	148.020	10.520	0.000	0.000	26.068	184.608
Commercial Use	28.65	17.767	15.098	11.694	65.557	138.77
Eco-Sensitive Areas	570.127	25.392	4.763	12.025	1.102	613.407
Public Utilities	190.967	0.639	0.245	0.273	6.619	198.743
Public-Semi Public Use	127.971	16.668	8.156	2.198	18.847	173.84
Traffic and Transportation	101.636	26.916	18.839	27.010	39.131	213.532
Industrial Use	23.834	32.167	3.012	43.711	43.724	146.448
Recreational Use	14.036	3.642	0.000	1.862	8.922	28.462
Developed Area	**1299.849**	**164.978**	**64.505**	**120.835**	**303.961**	**1954.13**
Agricultural Use	57.753	51.855	107.546	130.102	119.990	467.246
Vacant Land	93.746	35.141	17.606	15.999	22.442	184.934
Other Uses	54.738	7.434	2.617	2.829	1.225	68.843
Water Bodies	508.113	15.303	8.427	26.018	26.641	584.502
Green Area (Forest+NP)	928.595	189.165	123.509	29.727	761.278	2032.274
Specific Use	591.066	0.054	0.000	0.000	0.983	592.103
Undeveloped Area	**2234.011**	**298.952**	**259.705**	**204.675**	**932.559**	**3929.902**
Total Area	**3533.860**	**463.930**	**324.210**	**325.510**	**1236.520**	**5884.03**

Source: Consultant Analysis

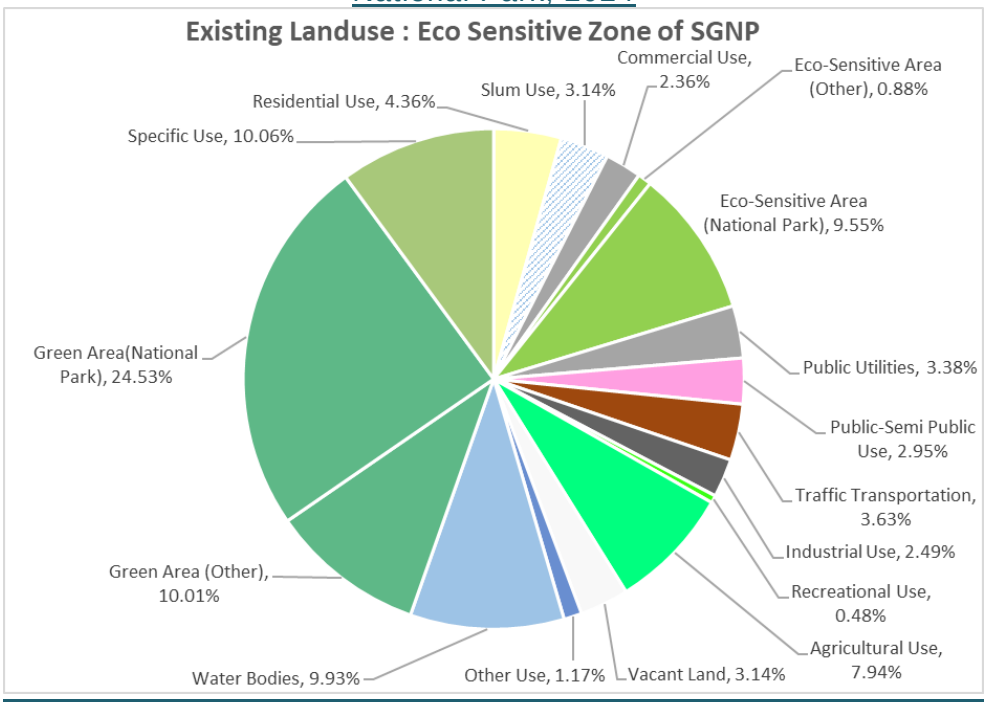
[3] Around 61.57 Ha of Area falls in the Ulhas River/Vasai Creek region along with which total of ESZ area is 59.456 Sq.km.

Table 5.2 Existing Land use Account of Eco-Sensitive Zone of Sanjay Gandhi National Park, 2024

Land use	Area (Ha)	Percentage of Developed Area	Percentage of Total Area
Residential Use	256.32	13.12%	4.36%
Slum Use	184.608	9.45%	3.14%
Commercial Use	138.77	7.10%	2.36%
Eco-Sensitive Areas	613.407	31.39%	10.42%
Public Utilities	198.743	10.17%	3.38%
Public-Semi Public Use	173.84	8.90%	2.95%
Traffic and Transportation	213.532	10.93%	3.63%
Industrial Use	146.448	7.49%	2.49%
Recreational Use	28.462	1.46%	0.48%
Developed Area	1954.130	100.00%	33.21%
Agricultural Use	467.246		7.94%
Vacant Land	184.934		3.14%
Other Uses	68.843		1.17%
Water Bodies	584.502		9.93%
Green Area (Forest)	2032.274		34.54%
Specific Use	592.103		10.06%
Undeveloped Area	3929.902		66.79%
Total Area	**5884.030**		**100.00%**

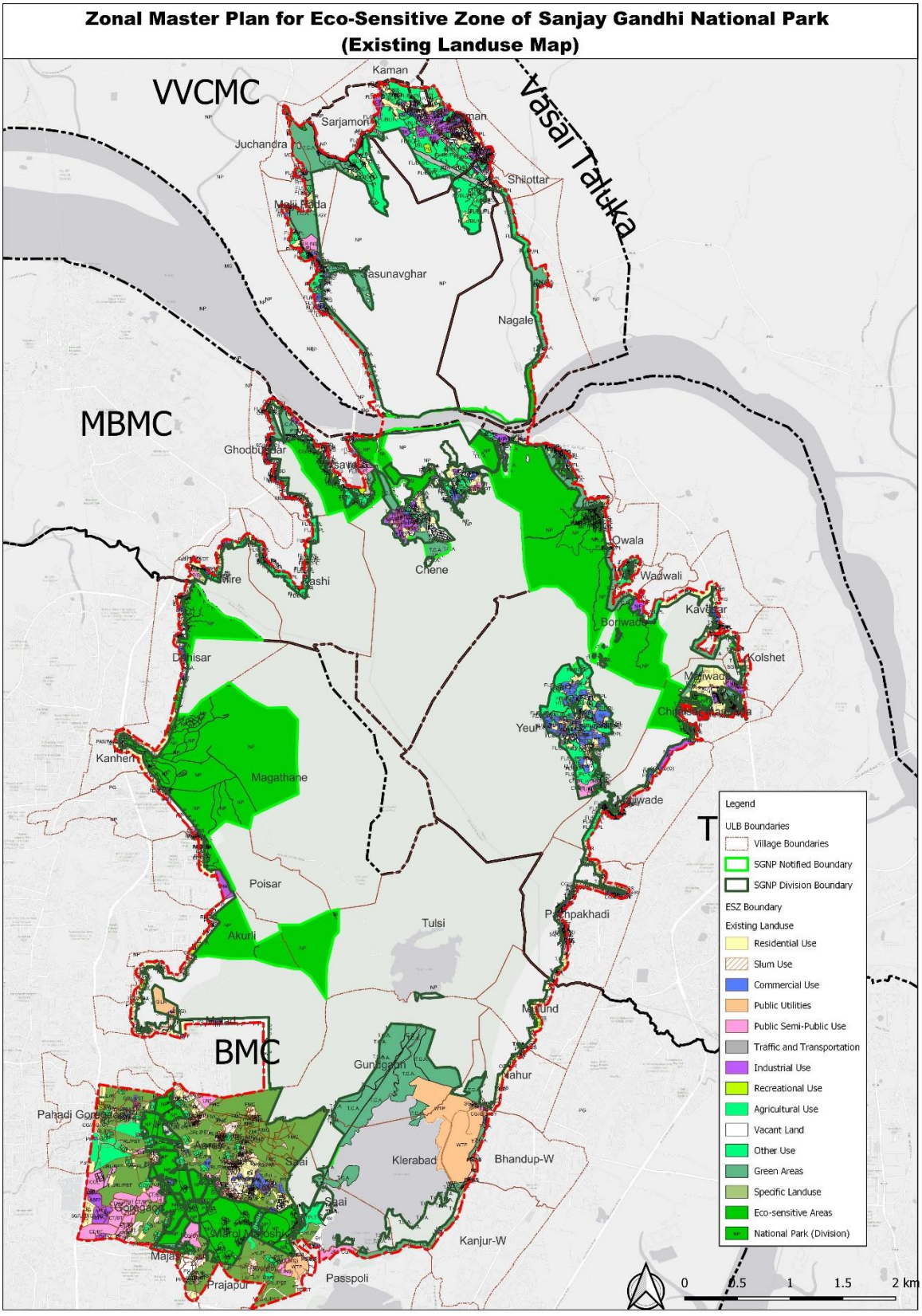
Source: Consultant Analysis

Figure 5.3 Existing Land use Distribution of Eco-Sensitive Zone of Sanjay Gandhi National Park, 2024



Source: Consultant Analysis

Figure 5.4 Existing Land use Map for Eco-Sensitive Zone for Sanjay Gandhi National Park, 2024



Source: Consultant Analysis

5.3 Detailed Landuse and Activity Distribution, ESZ

5.3.1 Residential land use

The Residential Use in ESZ is spread over 258.904 Ha, out of which more than 90% are primarily residential, remaining are either Gated complexes or Residential and commercial mixed activities. These are activities which are regulated as per the ESZ Notification 2016

Residential Land use – Sub Class	Total Area (Ha)
Residential/Commercial	8.655
Residential Area/ Colony	240.985
Township	6.680
Total	256.320

Source: Consultant Analysis

5.3.2 Slums & padas

There are large number of slums in the ESZ and the area under slums within the BMC exceeds that under the Residential use. As per the ESZ notification 2016, New slums and encroachments are prohibited activities within the ESZ.

Slum	Total Area (Ha)
Total	184.608

Source: Consultant Analysis

5.3.3 Commercial land use

Within the ESZ lies land of about 138 Ha is being utilised for commercial uses such as Private Offices, General Business and Retail and Hotel/Lodges or Restaurants. The uses are complementing to the Residential use within the ESZ. The table below gives sub class wise existing Land use.

Commercial Land use – Sub Class	Total Area (Ha)
Function Hall/ Marriage Garden	4.031
General Business	37.020
Hostel	1.100
Hotel/ Lodge/ Restaurant	45.850
Informal Shop	0.416
Market (Daily and Weekly)/ Mandi	0.353
Petrol Pump/ LPG Filling Station	1.174
Private Offices	10.097
Resort	34.291
Retail	1.034
Shopping Centre/ Mall	1.599
Commercial and Industrial	1.743
Banks	0.095
Total	**138.770**

Source: Consultant Analysis

5.3.4 Eco-sensitive area

Mangroves which form part of the eco-sensitive area is spread across an area of 51.719 Ha. in the entire ESZ area. Also, the developed portion of the National Park near the entrance area is categorised in eco sensitive area.

5.3.5 Social Infrastructure

Social infrastructure is a subset of the infrastructure sector and typically includes assets that accommodate social services to people. These include healthcare (medical facilities and ancillary infrastructure), education (schools, universities and student accommodation), and housing.

5.3.5.1 Educational facilities

Educational facilities in existing land use refer to the classification and allocation of land for schools, colleges, universities, and other learning institutions within a given area. These facilities play a crucial role in urban and regional planning as they influence population distribution, infrastructure development, and community accessibility.

Indian Institute of Management, Mumbai is present on the southern side of the Vihar Lake which forms part of the ESZ area. The Bharat Scouts & Guides National Training Centre is located at KV Powai IIT Campus. Indira Gandhi Institute of Development Research is located in the Film City area. Apart from these, schools and colleges are spatially distributed in the ESZ area.

Educational Facilities – Sub Class	Total Area (Ha)
Anganwadi	0.014
College	14.440
School	6.541
Training Institute	11.870
University	15.628
Vocational Institute / ITI	1.696
Total	**50.191**

Source: Consultant Analysis

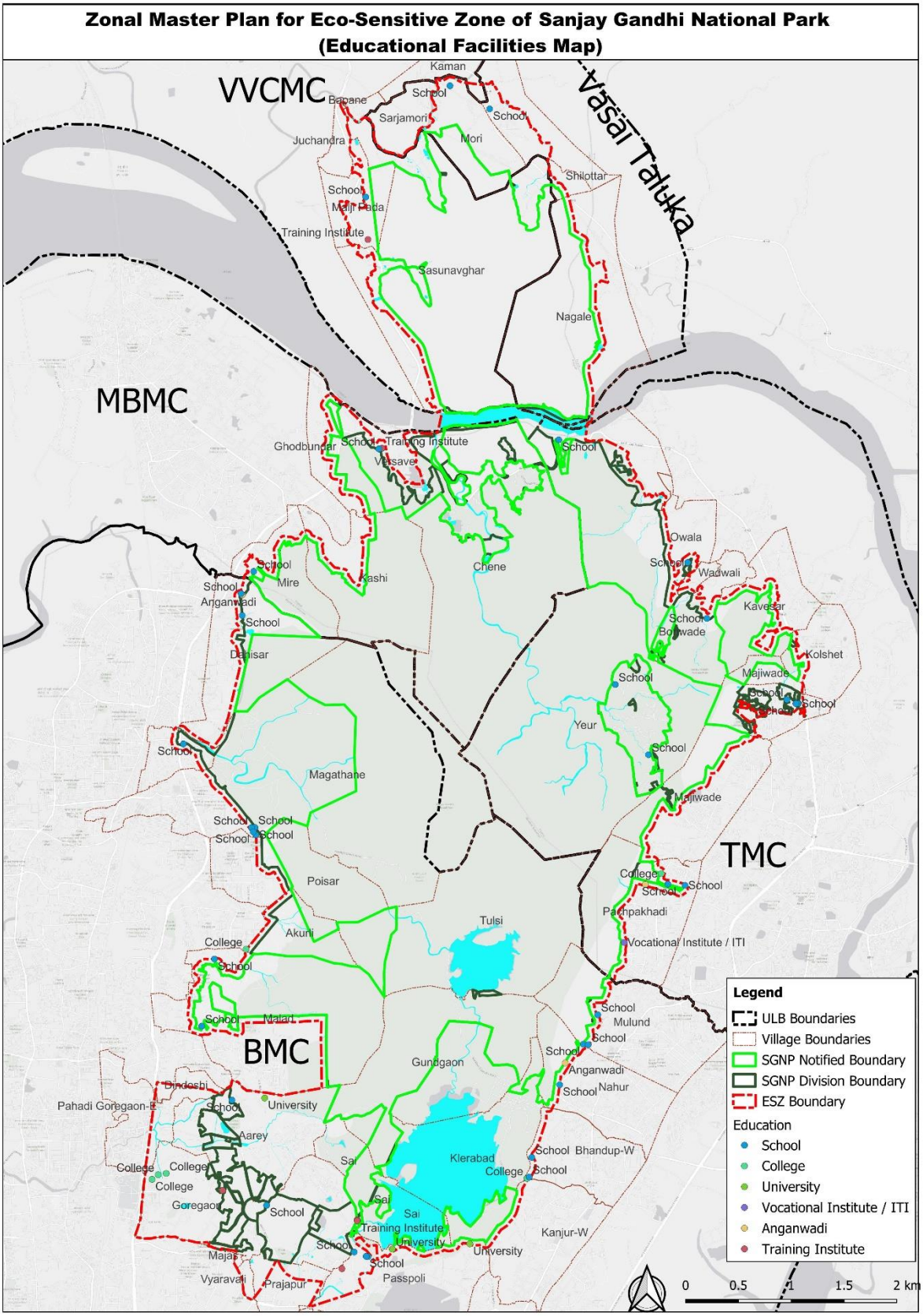
5.3.5.2 Health facilities

Health care services in existing land use refer to the planning and allocation of land for medical and wellness facilities. These facilities are essential for public health, emergency response, and community well-being. Integrating them effectively into urban and regional planning ensures accessibility, efficiency, and sustainability. There is a Government Hospital present in the Aarey area. Mumbai Veterinary College is located in the Goregaon area. The total area under Health facilities is 3.73 Ha, among which larges occupants are the Government Hospital and Veterinary College and Hospital.

Health Facilities – Sub Class	Total Area (Ha)
Clinic/Dispensary	0.101
Govt. Hospital/ Rural Hospital/ Municipal Hospital	0.402
Primary/ Community/ Urban Health Centre by ULB./ Govt	0.807
Veterinary hospital/Clinic	2.099
Private Hospital	0.323
Total	**3.732**

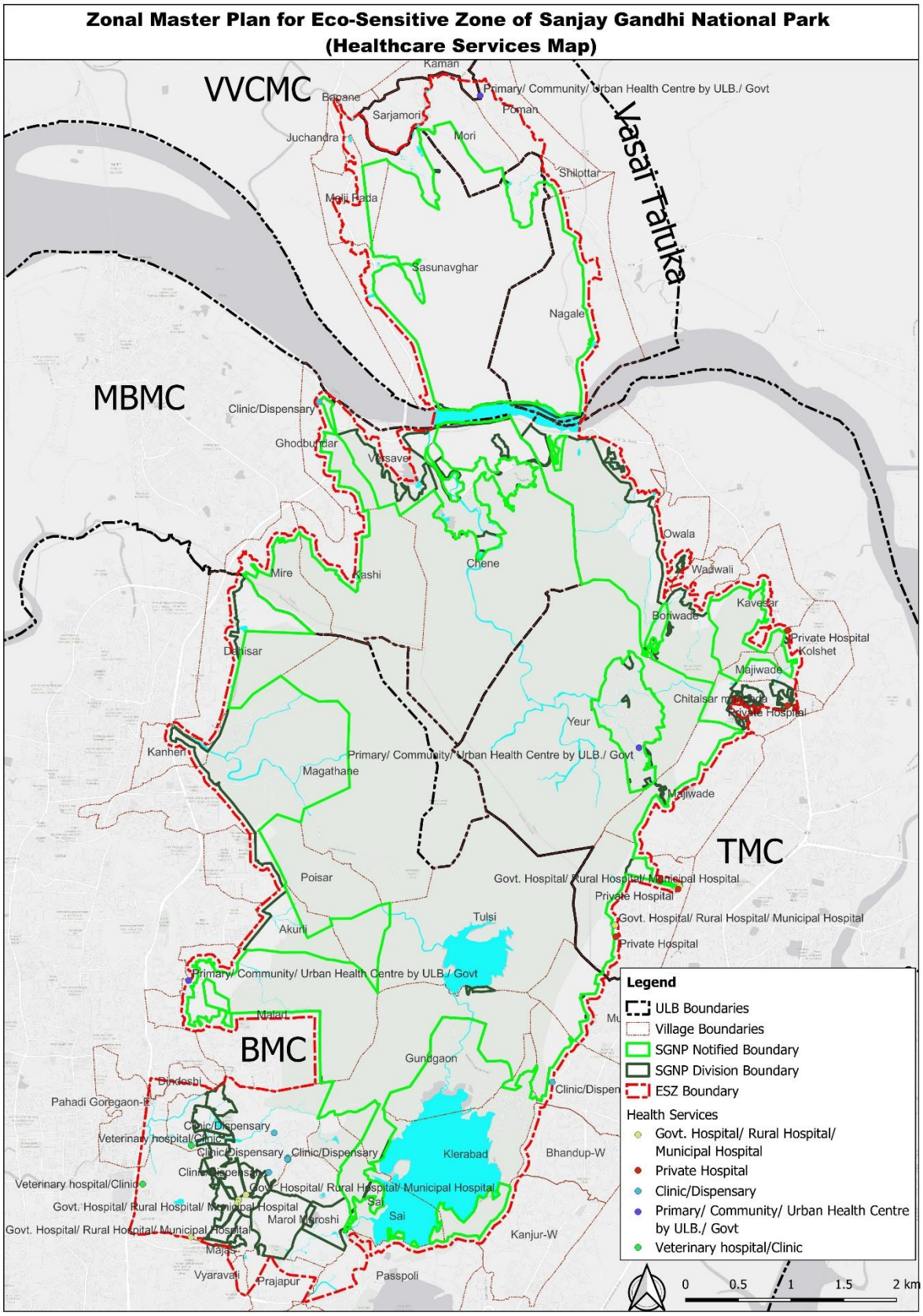
Source: Consultant Analysis

Figure 5.5 Educational Facilties in ESZ, SGNP



Source: Consultant Analysis

Figure 5.6 Healthcare Services in ESZ, SGNP



Source: Consultant Analysis

5.3.5.3 Other Public-Semi-Public

A Public & Semi-Public (PSP) Zone in land use planning refers to areas designated for facilities that serve the general public or specific community needs. These zones include essential public services which caters to the public. In this case, cantonment/battalion area, community hall, dhobi ghat, fire station, LPG/CNG Gas booking office, metrological station, police chowki and public/community toilets and other few areas are present. The total area under such facilities are 76 Ha, out of which 73 Ha is is under Cantonment/Batallion of the State Police Force at Aarey/Goregaon.

Public – Semi-Public Facilities – Sub Class	Total Area (Ha)
Cantonment/ Battalion	73.210
Community hall	0.520
Dhobi Ghat	0.140
Fire Station	0.015
LPG/ CNG Gas Booking Office	0.140
Metrological Station	0.100
Others	0.131
Police Station/Chowki	0.339
Public/ Community Toilet	0.600
Guesthouse	0.037
Social Welfare Centre	0.024
Auditorium/Town hall/ Multipurpose Hall/Drama theatre	0.271
Orphanage	0.845
Dharmashala	0.086
Total	**76.456**

Source: Consultant Analysis

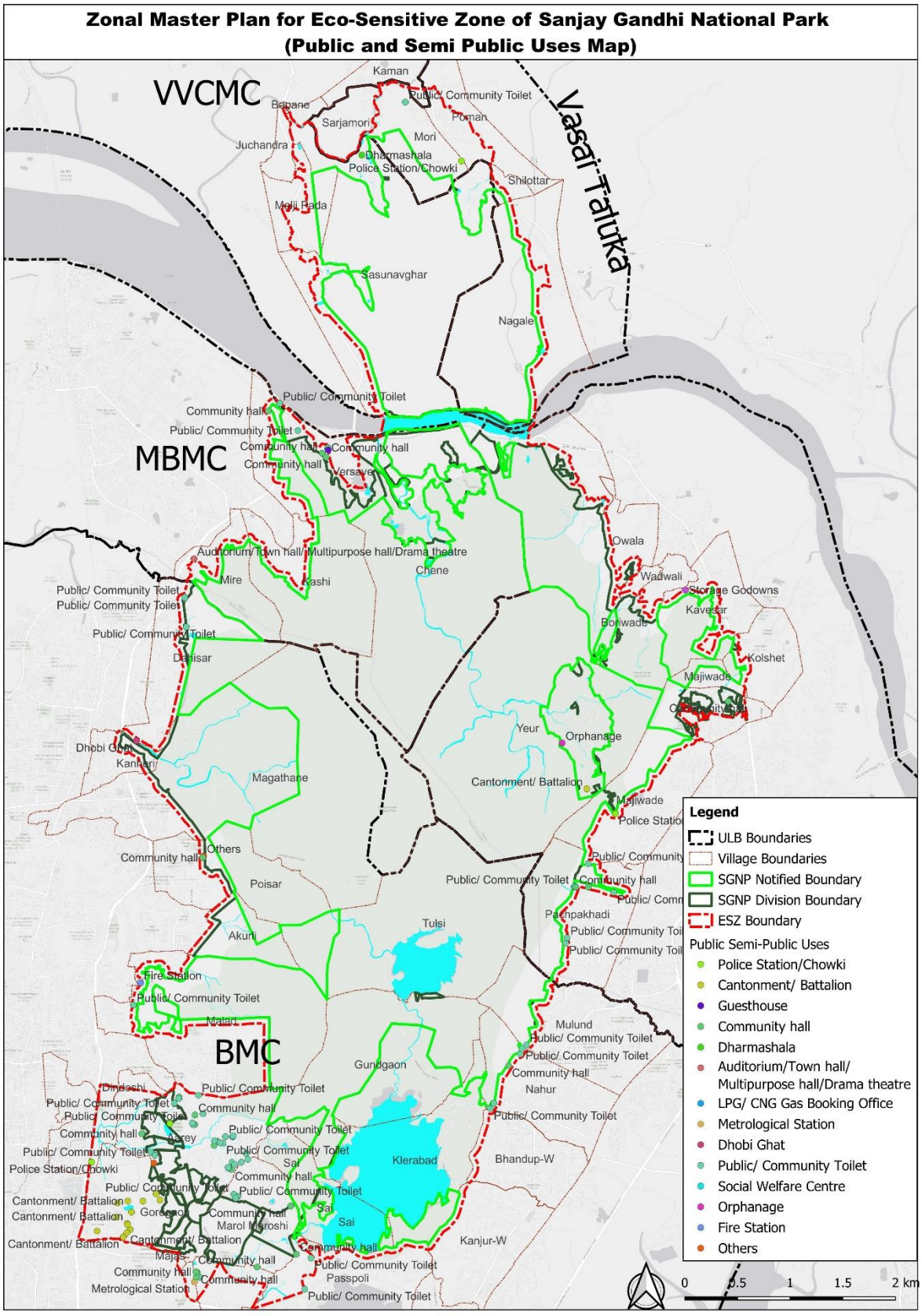
5.3.5.4 Religious

Religious places are an essential component of land use planning, categorized under Public and Semi-Public (PSP) zones in many urban and regional plans. These spaces serve as centers for worship, cultural activities, community gatherings, and social services.

Religious – Sub Class	Total Area (Ha)
Temple	6.712
Church	0.097
Dargah	0.107
Gurudwara	0.176
Mosque	1.524
Others	5.936
Total	**14.556**

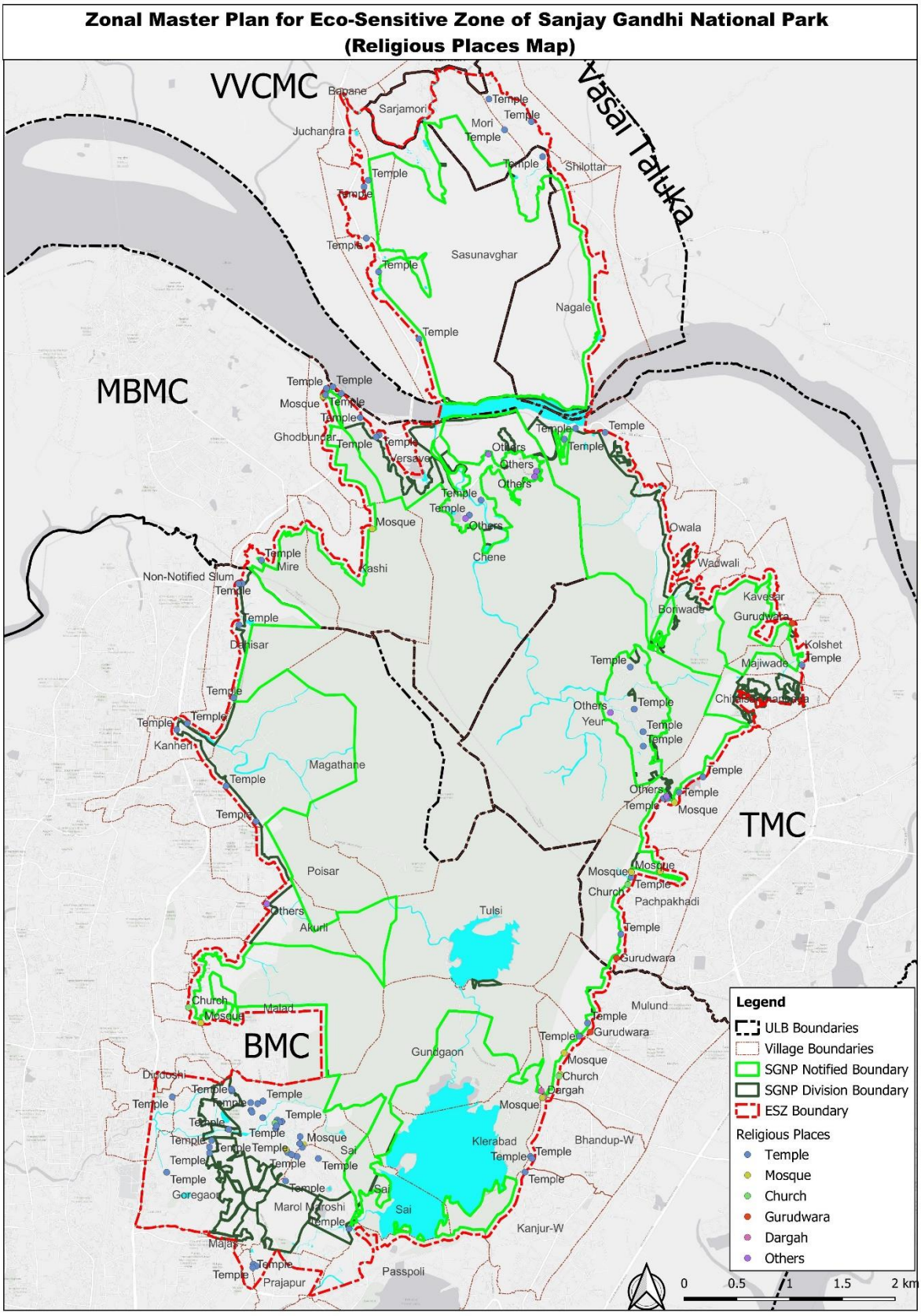
Source: Consultant Analysis

Figure 5.7 Other Public and Semi-Public Uses in ESZ, SGNP



Source: Consultant Analysis

Figure 5.8 Religious Facilties in ESZ,SGNP



Source: Consultant Analysis

5.3.5.5 Government property

There is presence of central government property office of Central Poultry Development Organization (Western Region) in BMC jurisdiction of ESZ. There is also state government property offices and quarters.

Government Property – Sub Class	Total Area (Ha)
Central Government Property – Office	13.197
State Government Property – Office	1.906
State Government Property - Quarter	13.093
Total	**28.196**

Source: Consultant Analysis

5.3.5.6 Recreational use

Recreational places in land use planning refer to areas designated for leisure, sports, cultural activities, and outdoor enjoyment. These spaces contribute to the well-being of communities by promoting physical activity, social interaction, and environmental sustainability. It enhances mental and physical well-being by providing spaces for relaxation and exercise. It also improves the visual appeal of cities and promotes green infrastructure. Parks, Gardens and Playground forms the majority of the portion of the recreational facilities with clubs, gymnasium and others to follow.

Recreational Facilities – Sub Class	Total Area (Ha)
Club	0.364
Garden	6.500
Gymnasium	0.180
Others	5.120
Park	4.750
Play Ground	6.077
Sports Centre	0.691
Amusement/ Theme Park	4.780
Total	**28.462**

Source: Consultant Analysis

5.3.6 Industrial use

Industrial activities are being carried out in the Eco Sensitive Zone of the SGNP. About 146 Ha of land is under Industrial use, some polluting and some Non-Polluting industries. About 89 Ha of land are categorised as manufacturing industry within the ESZ and consists of a bakery and the C & D Waste Processing Plant. Major industrial area is located within Vasai Taluka and TMC region. Industrial Activities are regulated and polluting industrial activities are prohibited in the ESZ. MPCB categorization of industries is given in bracket below.

Industrial - Sub Class	Total Area (Ha)
Agro based and Food Processing (Orange)	17.469
IT Parks (Orange)	0.992
Manufacturing (Red)	89.840
Other Industries (Red)	20.960
Storage Godown (Green)	8.602

Service (Orange)	3.690
Warehouse (Orange)	4.496
Pharmaceutical (Red)	0.399
Total	**146.448**

Source: Consultant Analysis

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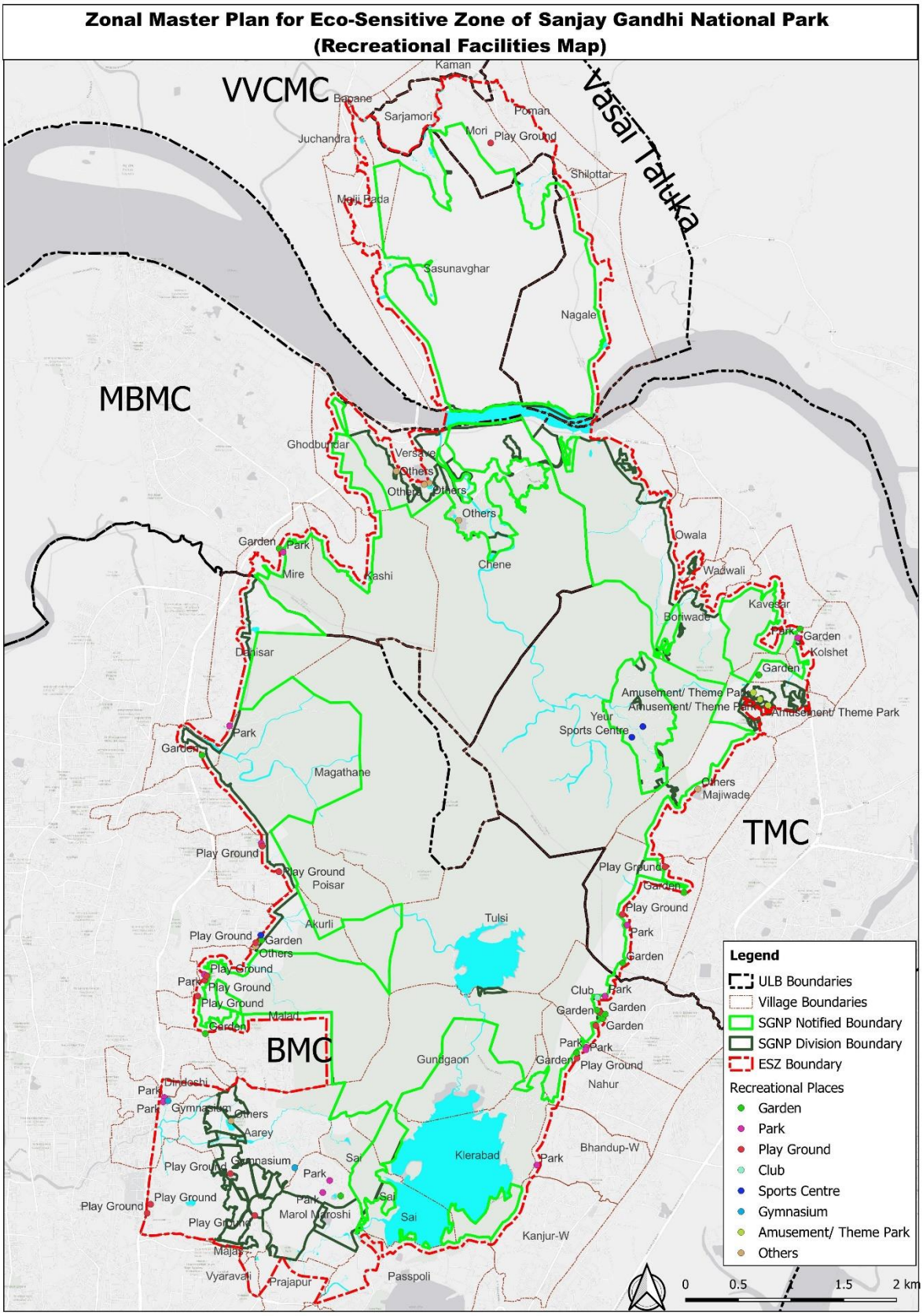
Figure 5.9 Recreational Facilties in ESZ, SGNP



Source: Consultant Analysis

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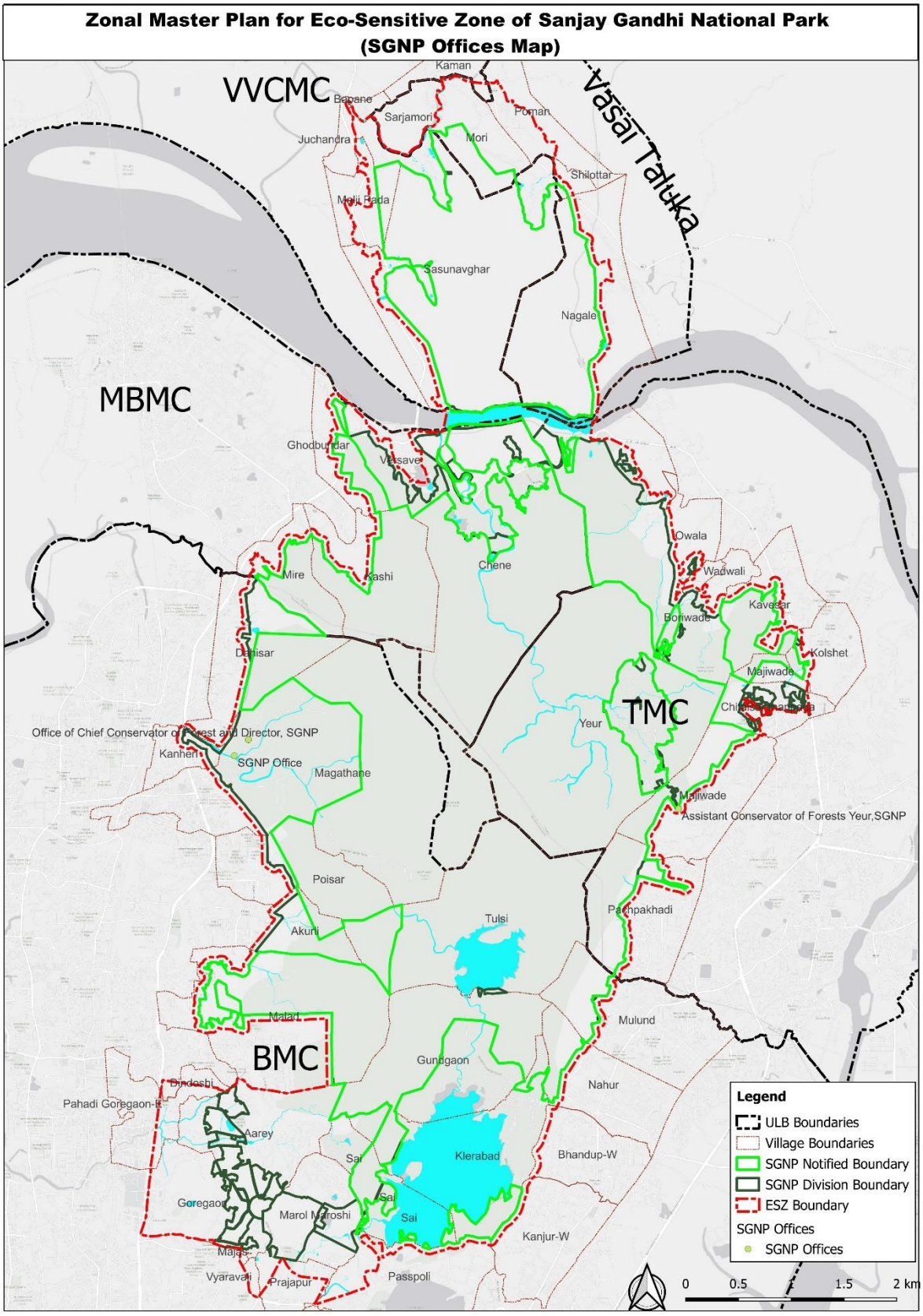
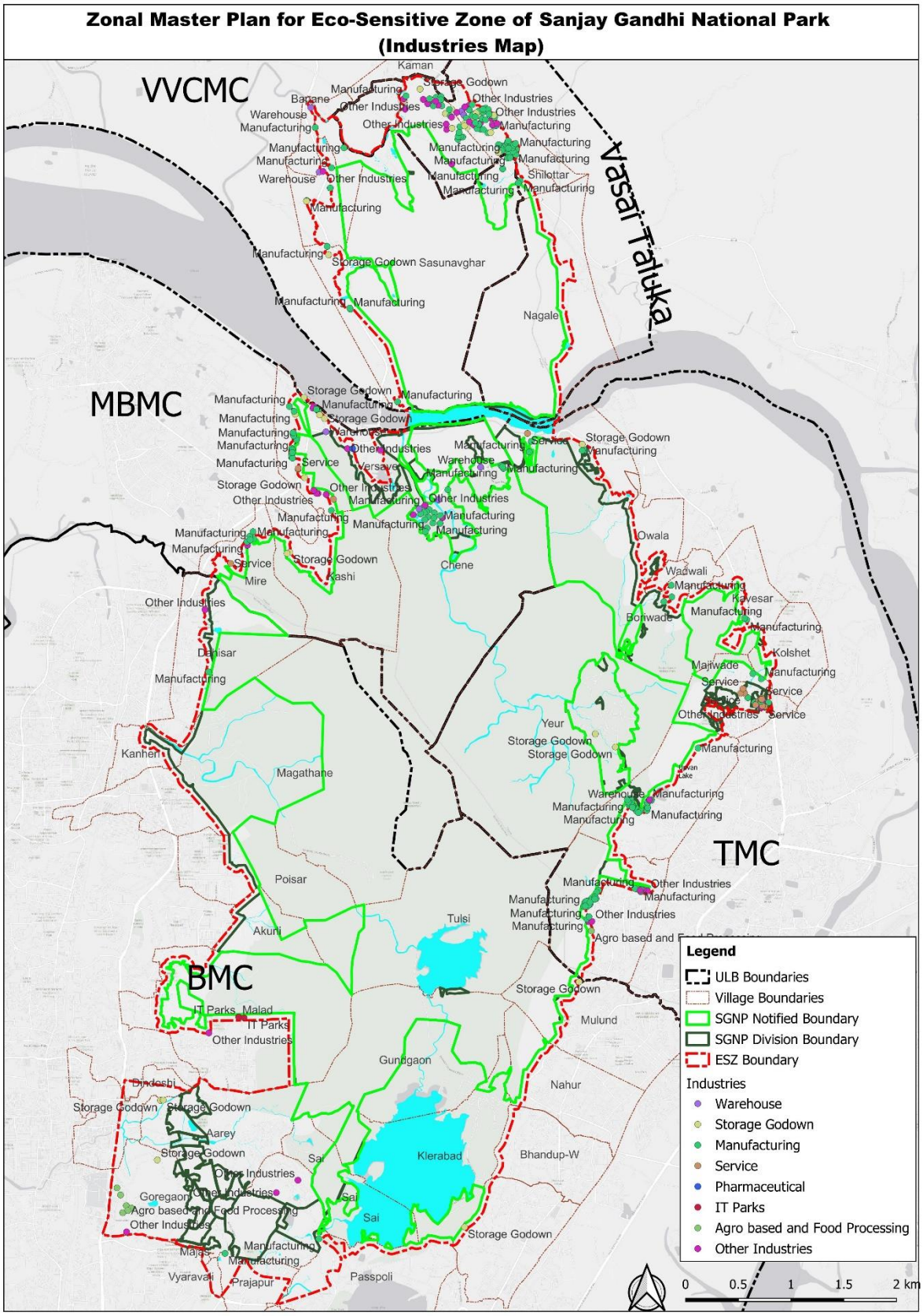
Figure 5.10 SGNP Offices



Source: Consultant Analysis

Figure 5.11 Industrial area in ESZ,SGNP



Source: Consultant Analysis

5.3.7 Traffic and transportation

A Traffic and Transportation use in existing land use refers to areas designated for transportation infrastructure and movement of people and goods. These includes a network of Internal and Collector Road Network in BMC area including those within Aarey, Film City etc. Small stretches of Arterial Road also form a part of the ESZ like Western Express Highway. Ghodbunder road also passes through ESZ in MBMC area.

Traffic and Transportation – Sub Class	Total Area (Ha)
Right of Way	4.268
Roads	189.303
Median/ Divider	1.215
Parking Space/ Area	0.871
Traffic Island	0.391
Bus stand/ Terminus	1.453
Railway Track Area	16.031
Total	**213.532**

Source: Consultant Analysis

The total road length in ESZ is 234.22 Kms, with majority of roads having width less than 9 Metres. Width wise Length distribution within ESZ is given below.

Table 5.3 Length of roads as per road widths

Length in KM						
S. No	**Road Width (Metres)**	**BMC**	**MBMC**	**VVCMC**	**VasaiTaluka**	**TMC**
1	0-6	66.318	13.088	10.156	17.375	22.086
2	6-9	39.812	6.671	1.533	2.203	4.595
3	9-12	16.620	2.358	0.185	3.366	3.274
4	12-15	3.600	0.788	0.400	2.435	1.032
5	15-18	2.152	0.323	0.000	0.000	1.915
6	18-24	0.504	2.483	0.800	0.000	1.660
7	24-30	0.228	1.467	0.000	0.000	0.348
8	30 and above	0.478	0.690	1.241	0.000	2.032
9	**Grand Total**	**129.712**	**27.868**	**14.315**	**25.379**	**36.942**

Source: Consultant Analysis

5.3.8 Agriculture Use

An Agriculture Zone in existing land use refers to areas designated for farming, livestock rearing, and other agricultural activities. There is presence of cropland and plantations in the Aarey area and Sai village area in BMC jurisdiction within the ESZ. There are villages in VVCMC as well as Vasai Taluka with agriculture land use.

Agriculture Use – Sub Class	Total Area (Ha)
Cropland	55.824
Plantations	17.010
Plant Nursery	0.790

Fallow land/Barren land/ Pad land	393.622
Total	**467.246**

Source: Consultant Analysis

5.3.9 Specific Use

Film city is located near Aarey. It serves as the backbone of India's Bollywood film industry, providing a wide range of indoor and outdoor filming locations Entire Aarey is covered with Grazing land/pastures. Grazing land refers to areas designated for livestock grazing, where animals such as cattle, sheep, and goats feed on natural or cultivated vegetation. These lands play a crucial role in agriculture, livestock management, and ecological balance. Excessive grazing can lead to soil erosion issues.

There is presence of 2 mining areas in BMC jurisdiction. One near Kandivali adjacent to forest boundary and other near Ketakipada in Dahisar also adjacent to forest boundary. Mining is prohibited in the ESZ and such areas which are not active, such land are denuded and appropriate measures are necessary to reclaim the land for environment. One Sand Depot is operational in Gaimukh region in TMC.

Specific Use – Sub Class	Total Area (Ha)
Flim City	181.355
Grazing land/Pastures	400.563
Mining Area	10.131
Hill/Mountain	0.054
Total	**592.103**

Source: Consultant Analysis

5.3.10 Other Use

This zone consists of area which are Tree Clad, water Bodies and Cow Sheds, Dairy Farm etc. Significant amount of area is covered under green areas under tree which helps in maintaining ecological balance in the Eco-sensitive zone. Significant lake that is covered under waterbodies is Vihar Lake that falls in the Klerabad, Gundgaon area and other rivers. Waterbodies in forests play a vital role in supporting wildlife by providing drinking water, maintaining biodiversity, and sustaining the ecosystem.

Other Zone – Sub Class	Total Area (Ha)
Green Area (Tree Clad Area)	588.433
National Park	1443.326
Protected Forest/Notified Forest	0.260
Water Bodies	584.507
Cow Shed	51.828
Dairy Farm	10.740
Nursery	2.102
Brick Kiln	2.829
Others	1.344
Vacant Land	184.601
Total	**2867.588**

Source: Consultant Analysis

5.3.11 Public Utilities

An area of 198.743 Ha is utilised for the provision of Public Utilities and or Infrastructure. A large area within this zone is the Water Treatment Plant at Bhandup.

Public Utilities – Sub Class	Total Area (Ha)
Post/ Telegraph Office	0.334
Telephone Exchange	0.008
Crematorium Burial Ground / Grave Yard	5.180
Electric Sub-Station	3.990
Ground Level Reservoir	18.320
Others	7.894
Pump House	0.450
Water Pumping Station	0.017
Water Treatment Plant	160.751
Satellite and Telecommunication Centre	1.450
Recycling Plant	0.320
Total	**198.743**

Source: Consultant Analysis

5.4 Existing Land use & Activities, BMC

Brihanmumbai Municipal Corporation covers about 60% of area of ESZ. The land use covered in this portion is diverse. Firstly, there are 2 lakes within the national park in BMC jurisdiction i.e., Tulsi Lake and Vihar Lake. Vihar Lake is situated at the extreme south and has a water spread of about 731.492 hectares and area of roughly 851.49 hectares. The area of 366 hectare is under the management of the National Park whilst the basin of the lake and the rest of the area are under the control of the Brihanmumbai Municipal Corporation. Tulsi Lake has actual water spread of 130.92 hectares and the area is about 745.25 hectares. The management of the water spread of this lake is also under the control of the Brihanmumbai Municipal Corporation. The river Dahisar originates from Tulsi Lake and flows through the forest of Magathane village and joins Manori Creek to the northwest of Dahisar village. Very few perennial water springs or waterholes are seen in the beds of the Dahisar River and its tributaries. Mithi River originates from Vihar Lake, and flows westwards out of the National Park and then into the Arabian Sea. Poisar River also originates from the SGNP and flows westwards into the Arabian Sea. The predominant use covering the SGNP ESZ area of BMC is Slum settlements.

P/N and R/S Ward coming under SGNP ESZ of area Goregaon East and Kandivali East of Mumbai is majorly covered by slum settlements. R/N Ward of SGNP ESZ of area Dahisar East is also substantially covered by slum settlements.

Because to the presence of the prestigious NITIE campus (now known as IIM, Mumbai), parts of the IIT Mumbai campus, and various Training Institutes, the ESZ part of S Ward, area Powai is primarily covered by green areas and institutional land use. There are sections of thick foliage and green grounds adjacent to these educational institutions. Even here, however, slum settlements border the roadways parallel to the Bhandup Water Treatment Plant, accompanied by industrial activity.

The T Ward is mostly covered by the watershed area of Vihar Lake and the Bhandup Water Treatment Plant, with the remainder being lush green forests/green space. The main portion of this Ward is covered in deep green forests and green area, which stands in stark contrast to the adjacent slum neighborhoods. Notably, new residential communities are sprouting up in Mulund West, adding to the area's diversified land use.

The Aarey Colony's P/S and K/E Wards form the largest buffer zone, extending roughly 4 kilometers from the Notified Forest area. This vast zone includes the Aarey Colony, which serves a wide range of land uses such as grazing pastures, dairy farms, and the renowned Film City Area. Aarey is also home to number of hamlets, where tribal communities engage in agriculture and dairy activities to sustain their livelihoods. Additionally, the State Reserve Police force is stationed in this part of Mumbai.

The SGNP Entrance and its activities the predominant feature of the R/C Ward, which includes Borivali East within the ESZ, and is surrounded by residential settlements.

The majority of R/N Ward, or Dahisar East of the ESZ, consists of up of denuded areas such as quarry sites and slum settlements, while related businesses and

manufacturing are also evident in this ward. Similar to this, the majority of R/S Ward, or Kandivali East, is made up of private vacant land, quarry sites, and slum settlements. There is also scarce presence of residential areas between.

To sum up, the whole BMC area inside the SGNP ESZ exhibits a diverse land use. The most prevalent is slum settlements, which are closely followed by green areas like grazing pastures, thick tree cover, dairy, significant institutional and educational campuses and residential areas. This diversity is a reflection of the intricate interactions that exist in this area between population/development pressure and Ecological balance.

Table 5.4 Ward wise predominant Existing Land use in BMC, 2024

S No.	Ward	Area	Predominant Land Use
1	P/N Ward	Goregaon (E)	Slum settlement
2	R/S Ward	Kandivali (E)	Private vacant land, quarry sites, and slum settlements.
3	R/N Ward	Dahisar (E)	Quarry sites and slum settlements.
4	S Ward	Powai	Green areas and institutional land use
5	T Ward	Mulund West	Watershed area of Vihar Lake and the Bhandup Water Treatment Plant, with the remainder being green area under forest and green cover
6	P/S Ward	Aarey Colony	wide range of land uses such as grazing pastures, dairy farms, and the renowned Film City Area
7	K/E Ward	Aarey Colony	National Park Division
8	R/C Ward	Borivali East	National Park Division

Source: Consultant Analysis

About 60% of the Eco Sensitive Zone extent within the BMC jurisdiction consists of undeveloped area i.e., having Agricultural uses, natural areas, forest, water bodies and vacant land etc. Eco Sensitive Areas form the largest part of the Existing landuse and activity within the developed area which consists of green and natural areas. The distribution of Existing Land use and activities within the BMC jurisdiction is given below

Table 5.5 Existing Land use Account of Eco-Sensitive Zone of Sanjay Gandhi National Park in BMC jurisdiction, 2024[4]

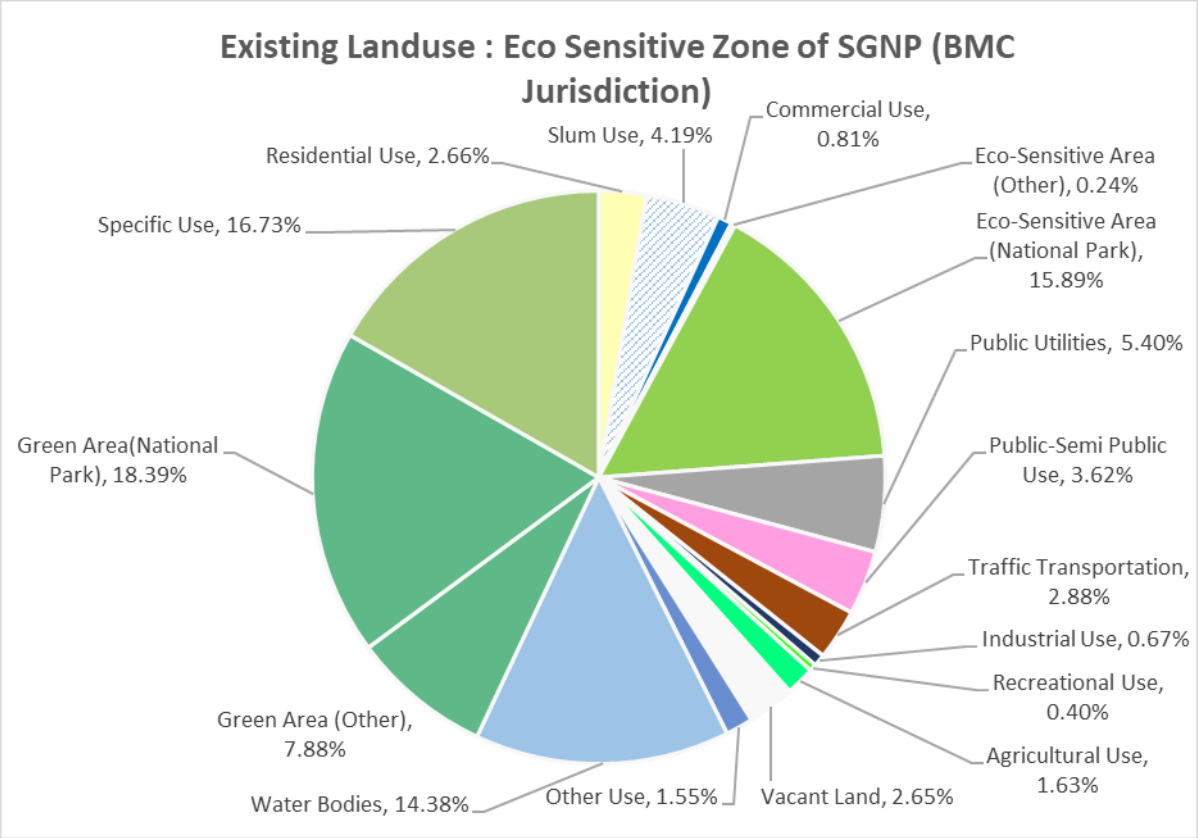
Land use	Area (Ha)	Percentage of Developed Area	Percentage of Total Area
Residential Use	94.608	7.28%	2.68%
Slum Use	148.02	11.39%	4.19%
Commercial Use	28.65	2.20%	0.81%
Eco-Sensitive Areas(Other+NP)	570.127	43.86%	16.13%
Public Utilities	190.967	14.69%	5.40%
Public-Semi Public Use	127.971	9.85%	3.62%

[4] Existing Landuse and Activity survey has been carried out in 2022-23. It has been updated for year 2024-25.

Traffic and Transportation	101.636	7.82%	2.88%
Industrial Use	23.834	1.83%	0.67%
Recreational Use	14.036	1.08%	0.40%
Developed Area	**1299.849**	100.00%	36.78%
Agricultural Use	57.753		1.63%
Vacant Land	93.746		2.65%
Other Uses	54.738		1.55%
Water Bodies	508.113		14.38%
Green Area(Forest+NP)	928.595		26.28%
Specific Use	591.066		16.73%
Undeveloped Area	**2234.011**		63.22%
Total	**3533.860**		**100.00%**

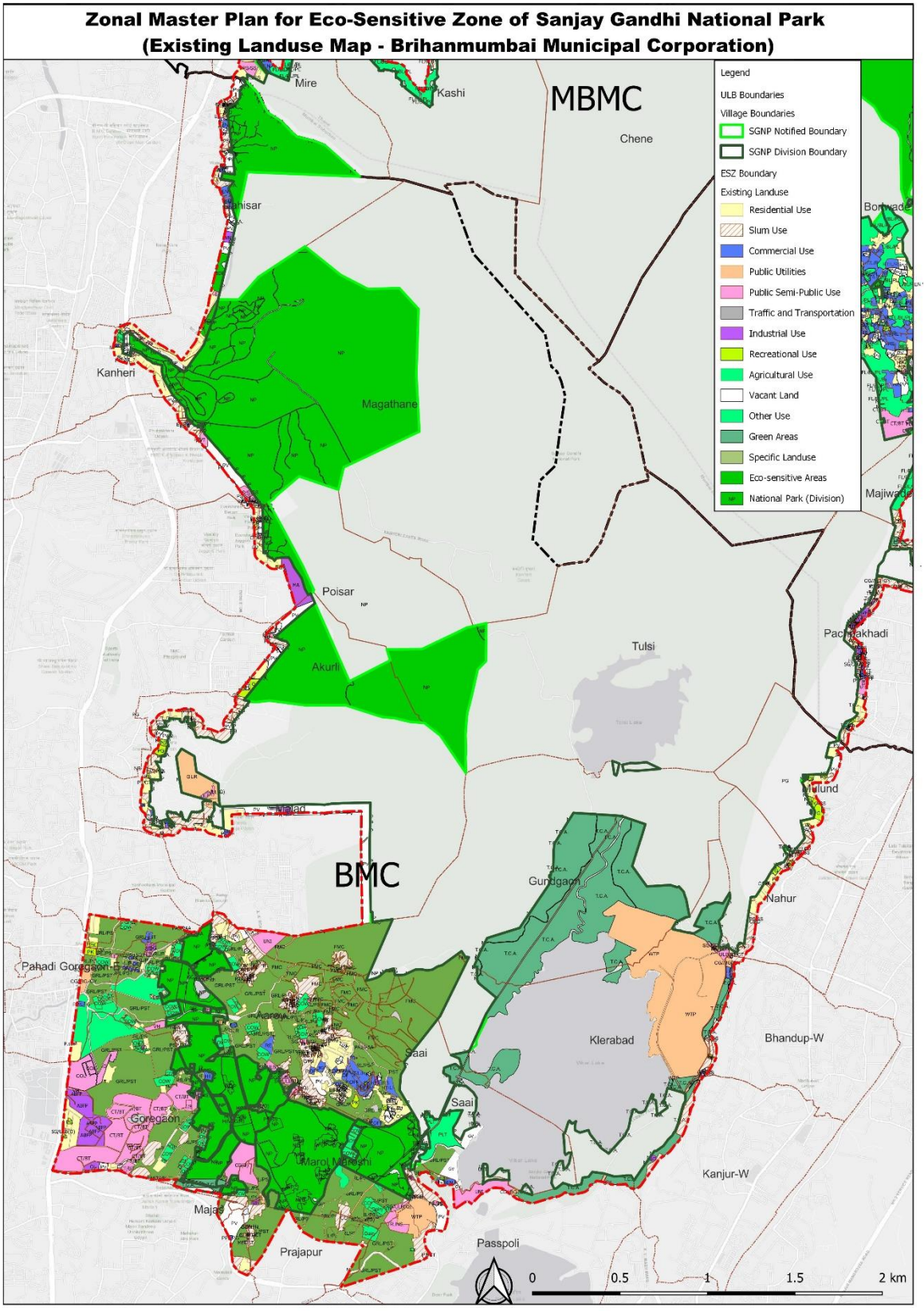
Source: Consultant Analysis

Figure 5.12 Existing Land use Distribution of Eco-Sensitive Zone of Sanjay Gandhi National Park, BMC, 2024



Source: Consultant Analysis

Figure 5.13 Existing Land use Map for Eco-Sensitive Zone for Sanjay Gandhi National Park, 2024, BMC



Source: Consultant Analysis

5.5 Detailed Landuse and Activity Distribution, BMC

5.5.1 Residential land use

The Residential Use under the ESZ in BMC is spread over 97.192 Ha, out of which more than 90% are primarily residential, remaining are either Gated complexes or Residential and commercial mixed activities. These are activities which are regulated as per the ESZ Notification 2016

Residential Land use – Sub Class	Total Area (Ha)
Residential/Commercial	0.065
Residential Area/ Colony	89.953
Township	4.590
Total	94.608

Source: Consultant Analysis

5.5.2 Slums & padas

There are large number of slums in the ESZ and the area under slums within the BMC exceeds that under the Residential use. As per the ESZ notification 2016, New slums and encroachments are prohibited activities within the ESZ. There are total 14 padas which falls in the ESZ area in BMC jurisdiction covering approx. 76.76 Ha out of the total 148.02 Ha.

Slum	Total Area (Ha)
Total	148.020

Source: Consultant Analysis

The table below highlights the ward wise distribution of Slums in ESZ within BMC jurisdiction. Ward P/S & P/N has the highest slum concentration within BMC in the ESZ.

Table 5.6 Ward Wise distribution of Slum Area in ESZ, BMC, 2024

BMC Ward	Total Area (Ha)	% Of total Slum area
K/E	11.55	7.80%
P/N	33.18	22.42%
P/S	55.87	37.74%
R/C	3.85	2.60%
R/N	6.11	4.13%
R/S	3.33	2.25%
S	18.31	12.37%
T	15.82	10.69%
Total	**148.02**	**100 %**

Source: Consultant Analysis

Table 5.7 Padas and their estimated population

Sr.no	Pada Name	Estimated Population (Nos)
1	Ketki Pada	113
2	Kokni Pada	517
3	KajuPada	566
4	Ultan Pada	239
5	Filter Pada	108

6	Moracha Pada	489
7	Devicha Pada	169
8	Tembhi Pada	407
9	Passpoli	224
10	Janupada	242
11	Damupada	24
12	Aamba Pada	163
13	Pimpri Pada	19
14	Ghati Pada	346
	Total	**3626**

Source: Tribal Development Department

As per the data from the Tribal Development Department, the total population of Padas that falls within ESZ in BMC area is 3626. However, these padas have undergone encroachments over the years.

5.5.3 Commercial land use

Within the ESZ lies land of about 28.65 Ha is being utilised for commercial uses such as Private Offices, General Business and Retail and Hotel/Lodges or Restaurants. The uses are complementing to the Residential use within the ESZ. The table below gives sub class wise existing Land use

Commercial Land use - Sub Class	Total Area (Ha)
Function Hall/ Marriage Garden	0.005
General Business	5.530
Hostel	1.100
Hotel/ Lodge/ Restaurant	6.678
Informal Shop	0.121
Market (Daily and Weekly)/ Mandi	0.353
Petrol Pump/ LPG Filling Station	0.654
Private Offices	8.630
Resort	1.771
Retail	0.662
Shopping Centre/ Mall	1.404
Commercial and Industrial	1.742
Total	**28.650**

Source: Consultant Analysis

5.5.4 Eco-sensitive area

Bio diversity park forms part of the eco-sensitive area which is spread across an area of 8.437 Ha. in the Magathane village area whereas the Eco-sensitive area within the SGNP Division as National Park is 1211.729 Ha.

5.5.5 Social Infrastructure

Social infrastructure is a subset of the infrastructure sector and typically includes assets that accommodate social services to people. These include healthcare (medical facilities and ancillary infrastructure), education (schools, universities and student accommodation), and housing.

5.5.5.1 Educational facilities

Educational facilities in existing land use refer to the classification and allocation of land for schools, colleges, universities, and other learning institutions within a given area. These facilities play a crucial role in urban and regional planning as they influence population distribution, infrastructure development, and community accessibility.

Indian Institute of Management, Mumbai is present on the southern side of the Vihar Lake which forms part of the ESZ area. The Bharat Scouts & Guides National Training Centre is located at KV Powai IIT Campus. Indira Gandhi Institute of Development Research is located in the Film City area. Apart from these, schools and colleges are spatially distributed in the ESZ area.

Educational Facilities – Sub Class	Total Area (Ha)
Anganwadi	0.003
College	14.280
School	2.817
Training Institute	4.520
University	15.628
Total	**37.248**

Source: Consultant Analysis

5.5.5.2 Health facilities

Health care services in existing land use refer to the planning and allocation of land for medical and wellness facilities. These facilities are essential for public health, emergency response, and community well-being. Integrating them effectively into urban and regional planning ensures accessibility, efficiency, and sustainability. There is a Government Hospital present in the Aarey area. Mumbai Veterinary College is located in the Goregaon area. The total area under Health facilities is 16.5 Ha, among which larges occupants are the Government Hospital and Veterinary College and Hospital

Health Facilities – Sub Class	Total Area (Ha)
Clinic/Dispensary	0.043
Govt. Hospital/ Rural Hospital/ Municipal Hospital	0.092
Veterinary hospital/Clinic	2.099
Total	**2.234**

Source: Consultant Analysis

5.5.5.3 Other Public-Semi-Public

A Public & Semi-Public (PSP) Zone in land use planning refers to areas designated for facilities that serve the general public or specific community needs. These zones include essential public services which caters to the public. In this case, cantonment/battalion area, community hall, dhobi ghat, fire station, LPG/CNG Gas booking office, metrological station, police chowki and public/community toilets and other few areas are present. The total area under such facilities are 64 Ha, out of which 62 Ha is is under Cantonment/Batallion of the State Police Force at Aarey/Goregaon.

Public – Semi-Public Facilities – Sub Class	Total Area (Ha)
Cantonment/ Battalion	61.974
Community hall	0.392
Dhobi Ghat	0.140
Fire Station	0.015
LPG/ CNG Gas Booking Office	0.140
Metrological Station	0.100
Others	0.131
Police Station/Chowki	0.242
Public/ Community Toilet	0.503
Total	**63.637**

Source: Consultant Analysis

5.5.5.4 Religious

Religious places are an essential component of land use planning, categorized under Public and Semi-Public (PSP) zones in many urban and regional plans. These spaces serve as centers for worship, cultural activities, community gatherings, and social services. There are 44 temples, 6 mosques,2 dargah,3 church and 1 gurudwara that falls in the Eco-Sensitive Zone across BMC jurisdiction.

Religious – Sub Class	Total Area (Ha)
Church	0.065
Dargah	0.107
Gurudwara	0.080
Mosque	0.245
Others	0.129
Temple	3.142
Total	**3.768**

Source: Consultant Analysis

5.5.5.5 Government property

There is presence of central government property office of Central Poultry Development Organization (Western Region) in BMC jurisdiction of ESZ. There is also state government property offices and quarters.

Government Property – Sub Class	Total Area (Ha)
Central Government Property – Office	12.644
State Government Property – Office	1.674
State Government Property - Quarter	6.767
Total	**21.085**

Source: Consultant Analysis

5.5.5.6 Recreational use

Recreational places in land use planning refer to areas designated for leisure, sports, cultural activities, and outdoor enjoyment. These spaces contribute to the well-being of communities by promoting physical activity, social interaction, and environmental sustainability. It enhances mental and physical well-being by providing spaces for relaxation and exercise. It also improves the visual appeal of cities and promotes

green infrastructure. Parks, Gardens and Playground forms the majority of the portion of the recreational facilities with clubs, gymnasium and others to follow.

Recreational Facilities – Sub Class	Total Area (Ha)
Club	0.364
Garden	4.325
Gymnasium	0.180
Others	1.167
Park	3.958
Play Ground	4.042
Total	**14.036**

Source: Consultant Analysis

5.5.6 Industrial use

Industrial activities are being carried out in the Eco Sensitive Zone of the SGNP. About 24 Ha of land is under Industrial use, some polluting and some Non-Polluting industries. About 2 Ha of land are categorised as manufacturing industry within the ESZ and consists of a bakery and the C & D Waste Processing Plant. Industrial Activities are regulated and polluting industrial activities are prohibited in the ESZ. MPCB categorization of industries is given in bracket below.

Industrial - Sub Class	Total Area (Ha)
Agro based and Food Processing (Orange)	17.169
IT Parks (Orange)	0.992
Manufacturing (Red)	2.022
Other Industries (Red)	1.820
Storage Godown (Green)	1.831
Total	**23.834**

Source: Consultant Analysis

5.5.7 Traffic and transportation

A Traffic and Transportation use in existing land use refers to areas designated for transportation infrastructure and movement of people and goods. These includes a network of Internal and Collector Road Network in BMC area including those within Aarey, Film City etc. Small stretches of Arterial Road also form a part of the ESZ like Western Express Highway

Traffic and Transportation – Sub Class	Total Area (Ha)
Right of Way	0.005
Roads	100.766
Median/ Divider	0.036
Parking Space/ Area	0.746
Traffic Island	0.083
Total	**101.636**

Source: Consultant Analysis

The total road length in ESZ is 129.71 Kms, with majority of roads having width less than 9 Metres. Width wise Length distribution within ESZ in BMC is given below

Table 5.8 Length of roads as per road widths, BMC

S. No	Road Width (Metres)	Length (Km)
1	Upto 6	66.318
2	6-9	39.812
3	9-12	16.620
4	12-15	3.600
5	15-18	2.152
6	18-24	0.504
7	24-30	0.228
8	45-60	0.478
9	**Grand Total**	**129.712**

Source: Consultant Analysis

5.5.8 Agriculture Use

An Agriculture Zone in existing land use refers to areas designated for farming, livestock rearing, and other agricultural activities. There is presence of cropland and plantations in the Aarey area and Sai village area in BMC jurisdiction within the ESZ.

Agriculture Use – Sub Class	Total Area (Ha)
Cropland	42.945
Plantations	14.808
Total	**57.753**

Source: Consultant Analysis

5.5.9 Specific Use

Film city is located near Aarey. It serves as the backbone of India's Bollywood film industry, providing a wide range of indoor and outdoor filming locations Entire Aarey is covered with Grazing land/pastures. Grazing land refers to areas designated for livestock grazing, where animals such as cattle, sheep, and goats feed on natural or cultivated vegetation. These lands play a crucial role in agriculture, livestock management, and ecological balance. Excessive grazing can lead to soil erosion issues.

There is presence of 2 mining areas in BMC jurisdiction. One near Kandivali adjacent to forest boundary and other near Ketakipada in Dahisar also adjacent to forest boundary. Mining is prohibited in the ESZ and such areas which are not active, such land are denuded and appropriate measures are necessary to reclaim the land for environment.

Specific Use – Sub Class	Total Area (Ha)
Flim City	181.355
Grazing land/Pastures	400.464
Mining Area	9.247
Total	**591.066**

Source: Consultant Analysis

5.5.10 Other Use

This zone consists of area which are Tree Clad, water Bodies and Cow Sheds, Dairy Farm etc. Significant amount of area is covered under green areas under tree which helps in maintaining ecological balance in the Eco-sensitive zone. Significant lake that is covered under waterbodies is Vihar Lake that falls in the Klerabad, Gundgaon area and other rivers. Waterbodies in forests play a vital role in supporting wildlife by providing drinking water, maintaining biodiversity, and sustaining the ecosystem.

Other Zone – Sub Class	Total Area (Ha)
Green Area (Tree Clad Area)	280.513
National Park (Division) Undeveloped	650.039
Water Bodies	508.113
Cow Shed	50.493
Dairy Farm	4.425
Vacant Land	87.110
Government Asset/ Vacant	8.596
Total	**1589.289**

Source: Consultant Analysis

5.5.11 Public Utilities

An area of 183 Ha is utilised for the provision of Public Utilities and or Infrastructure. A large area within this zone is the Water Treatment Plan at Bhandup

Public Utilities – Sub Class	Total Area (Ha)
Post/ Telegraph Office	0.334
Telephone Exchange	0.008
Crematorium Burial Ground / Grave Yard	4.172
Electric Sub-Station	0.560
Ground Level Reservoir	17.231
Others	7.535
Pump House	0.376
Water Treatment Plant	160.751
Total	**190.967**

Source: Consultant Analysis

5.6 Existing Land use & Activities – MBMC

Mira Bhayender Municipal Corporation covers about 8% of area of ESZ. The land use covered in this portion is diverse.

About 58% of the Eco Sensitive Zone extent within the MBMC jurisdiction consists of undeveloped area i.e having Agricultural uses, natural areas, forest, water bodies and vacant land etc. Eco Sensitive Areas form the largest part of the Existing landuse and activity within the developed area which consists of green and natural areas.

Table 5.9 Village wise predominant Existing Land use in MBMC, 2024

Sr. No	Village	Area	Predominant Land Use
1	Mire	Dahisar	Residential, Commercial
2	Kashi	Kashimira	Slums, & Fallow Land
3	Ghodbundar	Ghodbundar	Industrial, Commercial & National Park Division
4	Versave	Versave	Industrial, Commercial & National Park Division
5	Chene	Chene	Industrial, Fallow Land & National Park Division

Source: Consultant Analysis

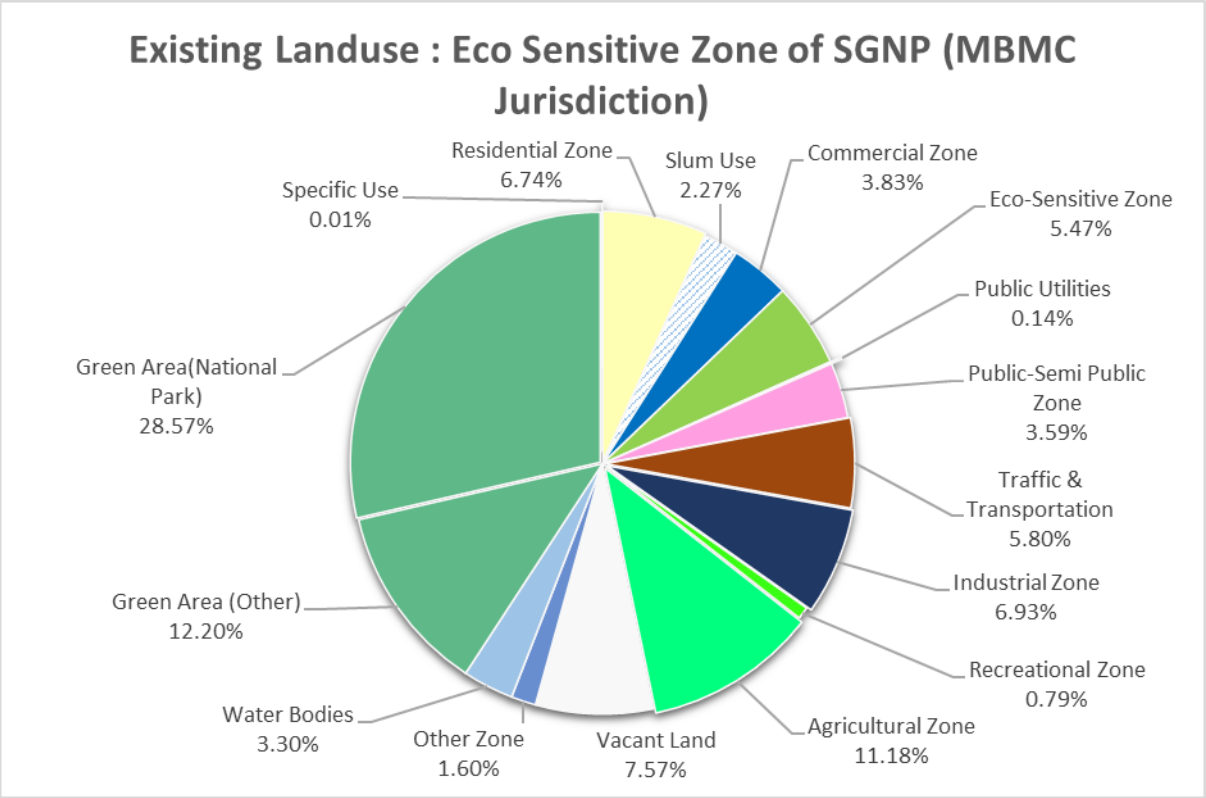
Table 5.10: Existing Land use Account of Eco-Sensitive Zone of Sanjay Gandhi National Park in MBMC jurisdiction, 2024[5]

Land use	Area (Ha)	Percentage of Developed Area	Percentage of Total Area
Residential Use	31.267	18.95%	6.74%
Slum Use	10.520	6.38%	2.27%
Commercial Use	17.767	10.77%	3.83%
Eco-Sensitive Areas	25.392	15.39%	5.47%
Public Utilities	0.639	0.39%	0.14%
Public-Semi Public Use	16.668	10.10%	3.59%
Traffic and Transportation	29.916	16.31%	5.80%
Industrial Use	32.167	19.50%	6.93%
Recreational Use	3.642	2.21%	0.79%
Developed Area	**164.978**	**100.00%**	**35.56%**
Agricultural Use	51.855		11.18%
Vacant Land	35.141		7.57%
Other Use	7.434		1.60%
Water Bodies	15.303		3.30%
Green Area (Forest+NP)	189.165		40.77%
Specific Use	0.054		0.01%
Undeveloped Area	**298.952**		**64.44%**
Total Area	**463.930**		**100.00%**

Source: Consultant Analysis

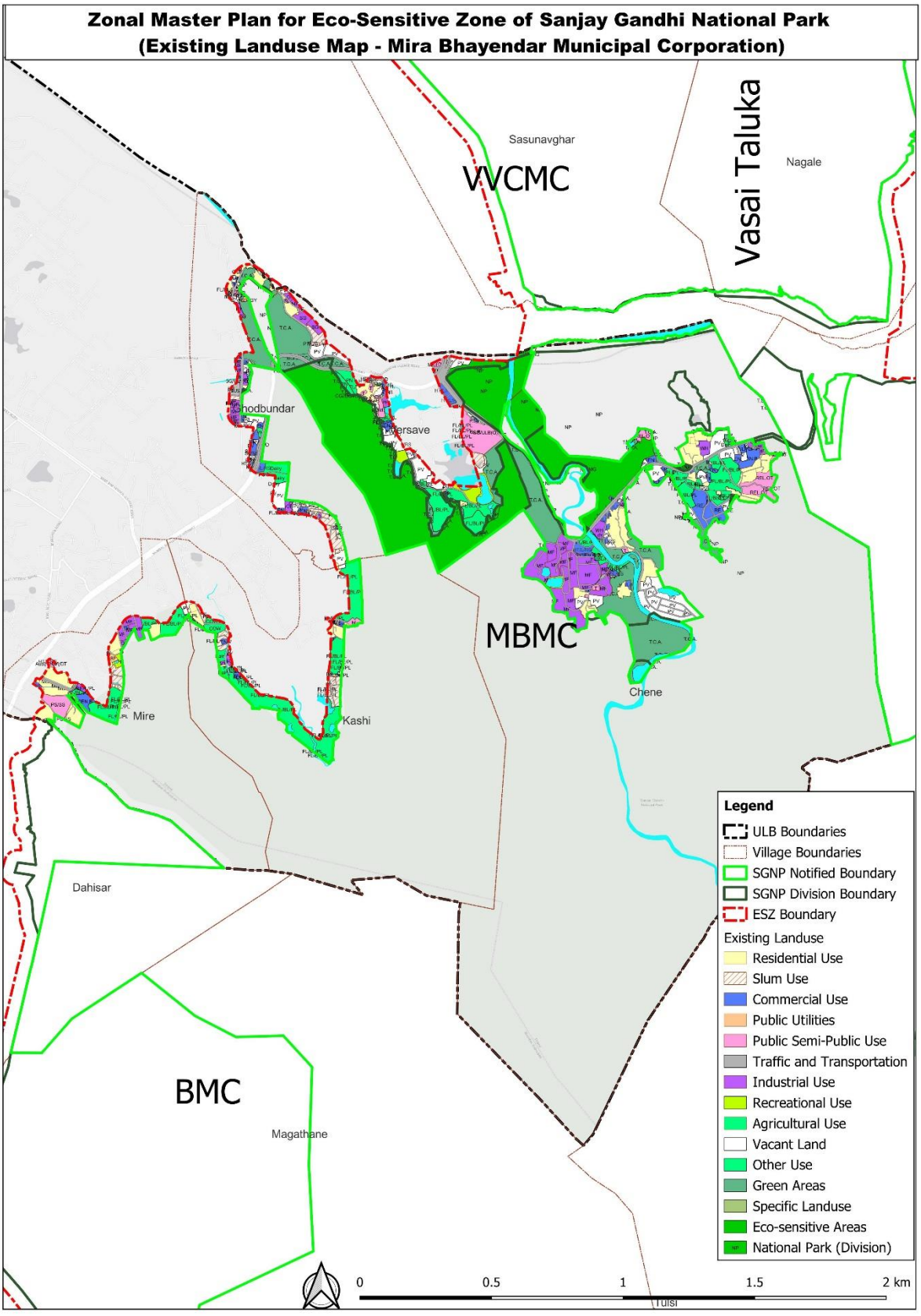
[5] Existing Landuse and Activity survey has been carried out in 2022-23. It has been updated for year 2024-25.

Figure 5.14 Existing Landuse Distribution of Eco-Sensitive Zone of Sanjay Gandhi National Park, MBMC, 2024



Source: Consultant Analysis

Figure 5.15 Existing Land use Map for Eco-Sensitive Zone for Sanjay Gandhi National Park, 2024, MBMC



Source: Consultant Analysis

5.7 Detailed Landuse and Activity Distribution, MBMC

5.7.1 Residential land use

The Residential Use under the ESZ in MBMC is spread over 31.27 Ha, out of which more than 90% are primarily residential, remaining are either Gated complexes or Residential and commercial mixed activities. These are activities which are regulated as per the ESZ Notification 2016.

Residential Land use – Sub Class	Total Area (Ha)
Residential/Commercial	1.602
Residential Area/ Colony	29.668
Total	31.270

Source: Consultant Analysis

5.7.2 Slums & padas

There are large number of slums in the ESZ and the area under slums within the MBMC exceeds that under the Residential use. As per the ESZ notification 2016, New slums and encroachments are prohibited activities within the ESZ. 10.52 Ha of area under ESZ in MBMC falls under Slums.

Slum	Total Area (Ha)
Total	10.520

Source: Consultant Analysis

5.7.3 Commercial land use

Within the ESZ lies land of about 17.79 Ha is being utilised for commercial uses such as Resorts, General Business and Hotel/Lodges or Restaurants. The uses are complementing to the Residential use within the ESZ. In MBMC area, 17.796 Ha of area fall under Commercial land use. The table below gives sub class wise existing Land use.

Commercial Land use - Sub Class	Total Area (Ha)
General Business	8.397
Hotel/ Lodge/ Restaurant	3.885
Petrol Pump/ LPG Filling Station	0.311
Private Offices	0.083
Resort	4.935
Shopping Centre/ Mall	0.185
Total	**17.796**

Source: Consultant Analysis

5.7.4 Eco-sensitive area

Mangrove forms part of the eco-sensitive area which is spread across an area of 25.392 Ha. in the Versave village area.

5.7.5 Social Infrastructure

Social infrastructure is a subset of the infrastructure sector and typically includes assets that accommodate social services to people. These include healthcare (medical facilities and ancillary infrastructure), education (schools, universities and student accommodation), and housing.

5.7.5.1 Educational facilities

Educational facilities in existing land use refer to the classification and allocation of land for schools, colleges, universities, and other learning institutions within a given area. These facilities play a crucial role in urban and regional planning as they influence population distribution, infrastructure development, and community accessibility.

Major school is present in the Mire area in MBMC. Pharmaceutical training centre in Versave is also present.

Educational Facilities – Sub Class	Total Area (Ha)
School	2.584
Training Institute	0.109
Total	**2.693**

Source: Consultant Analysis

5.7.5.2 Health facilities

Health care services in existing land use refer to the planning and allocation of land for medical and wellness facilities. These facilities are essential for public health, emergency response, and community well-being. Integrating them effectively into urban and regional planning ensures accessibility, efficiency, and sustainability. No major health facilities are found in the MBMC area under ESZ.

Health Facilities – Sub Class	Total Area (Ha)
Clinic/Dispensary	0.058
Total	**0.058**

Source: Consultant Analysis

5.7.5.3 Other Public-Semi-Public

A Public & Semi-Public (PSP) Zone in land use planning refers to areas designated for facilities that serve the general public or specific community needs. These zones include essential public services which caters to the public. In this case, community hall, guest house, and auditiorium are present. The total area under such facilities are 1 Ha. Hajiyani Ayshaben Kasambhai Balesariya Memorial Cultural Center is present in Versave and Bharat Ratna Gaansamragyi Lata Mangeshkar Natya Gruha Auditorium is present in Mire in MBMC.

Public – Semi-Public Facilities – Sub Class	Total Area (Ha)
Community hall	0.709
Guest House	0.037
Auditorium/Town hall/ Multipurpose Hall/Drama theatre	0.271
Total	**1.017**

Source: Consultant Analysis

5.7.5.4 Religious

Religious places are an essential component of land use planning, categorized under Public and Semi-Public (PSP) zones in many urban and regional plans. These spaces serve as centers for worship, cultural activities, community gatherings, and social

services. There are 8 temples, 2 mosques, 1 church and 1 other religious place that falls in the Eco-Sensitive Zone across MBMC jurisdiction.

Religious – Sub Class	Total Area (Ha)
Church	0.022
Mosque	0.537
Others	5.014
Temple	0.845
Total	**6.418**

Source: Consultant Analysis

5.7.5.5 Government property

There is presence of central government property office in MBMC jurisdiction of ESZ. There is also state government property offices and quarters in MBMC jurisdiction.

Government Property – Sub Class	Total Area (Ha)
Central Government Property – Office	0.357
State Government Property – Office	0.030
State Government Property - Quarter	6.093
Total	**6.480**

Source: Consultant Analysis

5.7.5.6 Recreational use

Recreational places in land use planning refer to areas designated for leisure, sports, cultural activities, and outdoor enjoyment. These spaces contribute to the well-being of communities by promoting physical activity, social interaction, and environmental sustainability. It enhances mental and physical well-being by providing spaces for relaxation and exercise. It also improves the visual appeal of cities and promotes green infrastructure. Parks, Gardens and Playground forms the majority of the portion of the recreational facilities with clubs, gymnasium and others to follow.

Recreational Facilities – Sub Class	Total Area (Ha)
Others	3.192
Park	0.460
Total	**3.652**

Source: Consultant Analysis

5.7.6 Industrial use

Industrial activities are being carried out in the Eco Sensitive Zone of the SGNP. About 32 Ha of land is under Industrial use, some polluting and some Non-Polluting industries. There is huge amount of manufacturing industries in Chene area in MBMC. Industrial Activities are regulated and polluting industrial activities are prohibited in the ESZ. MPCB categorization of industries is given in bracket below.

Industrial - Sub Class	Total Area (Ha)
Manufacturing (Red)	26.015
Other Industries (Red)	1.178
Storage Godown (Green)	2.148
Service (Red/Green/Orange)	0.392
Pharmaceutical (Red)	0.399

Warehouse (Green)	2.085
Total	**32.217**

Source: Consultant Analysis

5.7.7 Traffic and transportation

A Traffic and Transportation use in existing land use refers to areas designated for transportation infrastructure and movement of people and goods. These includes a network of Internal and Collector Road Network in MBMC area. Small stretches of Arterial Road also form a part of the ESZ like Western Express Highway and Ghodbunder Road.

Traffic and Transportation – Sub Class	Total Area (Ha)
Right of Way	1.040
Roads	26.964
Median/ Divider	0.146
Traffic Island	0.257
Bus stand/ Terminus	0.680
Total	**29.087**

Source: Consultant Analysis

Total length in ESZ in MBMC is 27.87 Kms with majority of roads having width less than 9 Metres. Width wise Length distribution within ESZ in MBMC is given below.

Table 5.11 Length of roads as per road widths, MBMC

S. No	Road Width (Metres)	Length (Km)
1	Upto 6	13.088
2	6-9	6.671
3	9-12	2.358
4	12-15	0.788
5	15-18	0.323
6	18-24	2.483
7	24-30	1.467
8	30 and above	0.690
9	**Grand Total**	**27.868**

Source: Consultant Analysis

5.7.8 Agriculture Use

An Agriculture Zone in existing land use refers to areas designated for farming, livestock rearing, and other agricultural activities. There is a huge presence of fallow/barren/pad land in the Kashi, Chenne and Mire area in MBMC jurisdiction within the ESZ. A plant nursery is located in Ghodbunder area.

Agriculture Use – Sub Class	Total Area (Ha)
Plant Nursery	0.238
Fallow land/Barren land/ Pad land	51.624
Total	**51.862**

Source: Consultant Analysis

5.7.9 Specific Use

Under specific land use, a very little portion of hill/mountain falls in the MBMC jurisdiction.

Specific Use – Sub Class	Total Area (Ha)
Hill/ Mountain	0.054
Total	**0.054**

Source: Consultant Analysis

5.7.10 Other Use

This zone consists of area which are Tree Clad, water Bodies and Cow Sheds, Dairy Farm etc. Significant amount of area is covered under green areas under tree which helps in maintaining ecological balance in the Eco-sensitive zone. Waterbodies in forests play a vital role in supporting wildlife by providing drinking water, maintaining biodiversity, and sustaining the ecosystem. Tree Clad Area dominates the other uses in MBMC.

Other Zone	Total Area (Ha)
Green Area (Tree Clad Area)	68.461
National Park (Division)	112.42
Water Bodies	20.666
Cow Shed	1.335
Dairy Farm	3.997
Vacant Land	35.480
Protected Forest/ Notified Forest	0.255
Nursery	2.147
Total	**244.761**

Source: Consultant Analysis

5.7.11 Public Utilities

An area of 0.65 Ha is utilised for the provision of Public Utilities and or Infrastructure. There is no major public utility infrastructure in ESZ in MBMC jurisdiction.

Public Utilities – Sub Class	Total Area (Ha)
Crematorium Burial Ground / Grave Yard	0.250
Electric Sub-Station	0.006
Ground Level Reservoir	0.041
Recycling Plant	0.317
Satellite and Telecommunication Centre	0.036
Total	**0.650**

Source: Consultant Analysis

5.8 Existing Land use & Activities – VVCMC

Vasai Virar City Municipal Corporation covers about 5.5% of area of ESZ. The land use covered in this portion is diverse.

About 80% of the Eco Sensitive Zone extent within the VVCMC jurisdiction consists of undeveloped area i.e. having Agricultural uses, natural areas, forest, water bodies and vacant land etc. Fair Amount of Residential, Commercial, Public-Semi Public and Traffic and Transportation cover the developed area.

Table 5.12 Village wise predominant Existing Land use in VVCMC, 2024

Sr. No	Village	Area	Predominant Land Use
1	Juchandra	Mori	Warehouse and Mangroves
2	Kaman	Kaman	Agriculture land and Private Vacant
3	Bapane	Bapane	Waterbody
4	Sasunavghar	Sasunavghar	Tree Clad and Agricultural land
5	Malji Pada	Chene	Tree Clad and Training Institute

Source: Consultant Analysis

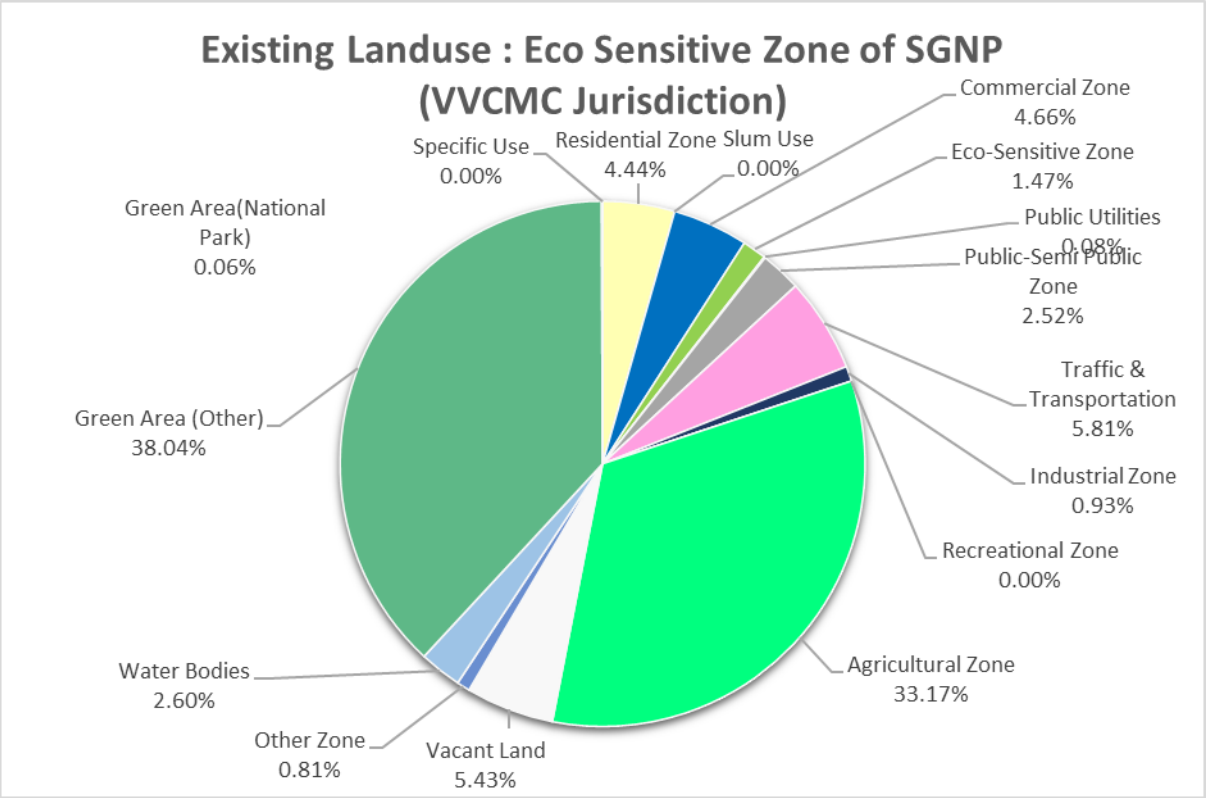
Table 5.13: Existing Land use Account of Eco-Sensitive Zone of Sanjay Gandhi National Park in VVCMC jurisdiction, 2024[6]

Land use	Area (Ha)	Percentage of Developed Area	Percentage of Total Area
Residential Use	14.392	22.31%	4.44%
Slum Use	0.000	0.00%	0.00%
Commercial Use	15.098	23.41%	4.66%
Eco-Sensitive Areas	4.763	7.38%	1.47%
Public Utilities	0.245	0.38%	0.08%
Public-Semi Public Use	8.156	12.64%	2.52%
Traffic and Transportation	18.839	29.21%	5.81%
Industrial Use	3.012	4.67%	0.93%
Recreational Use	0.000	0.00%	0.00%
Developed Area	**64.505**	**100.00%**	**19.90%**
Agricultural Use	107.546		33.17%
Vacant Land	17.606		5.43%
Other Use	2.617		0.81%
Water Bodies	8.427		2.60%
Green Area (Forest+NP)	123.509		38.10%
Specific Use	0.000		0.00%
Undeveloped Area	**259.705**		**80.10%**
Total Area	**324.210**		**100.00%**

Source: Consultant Analysis

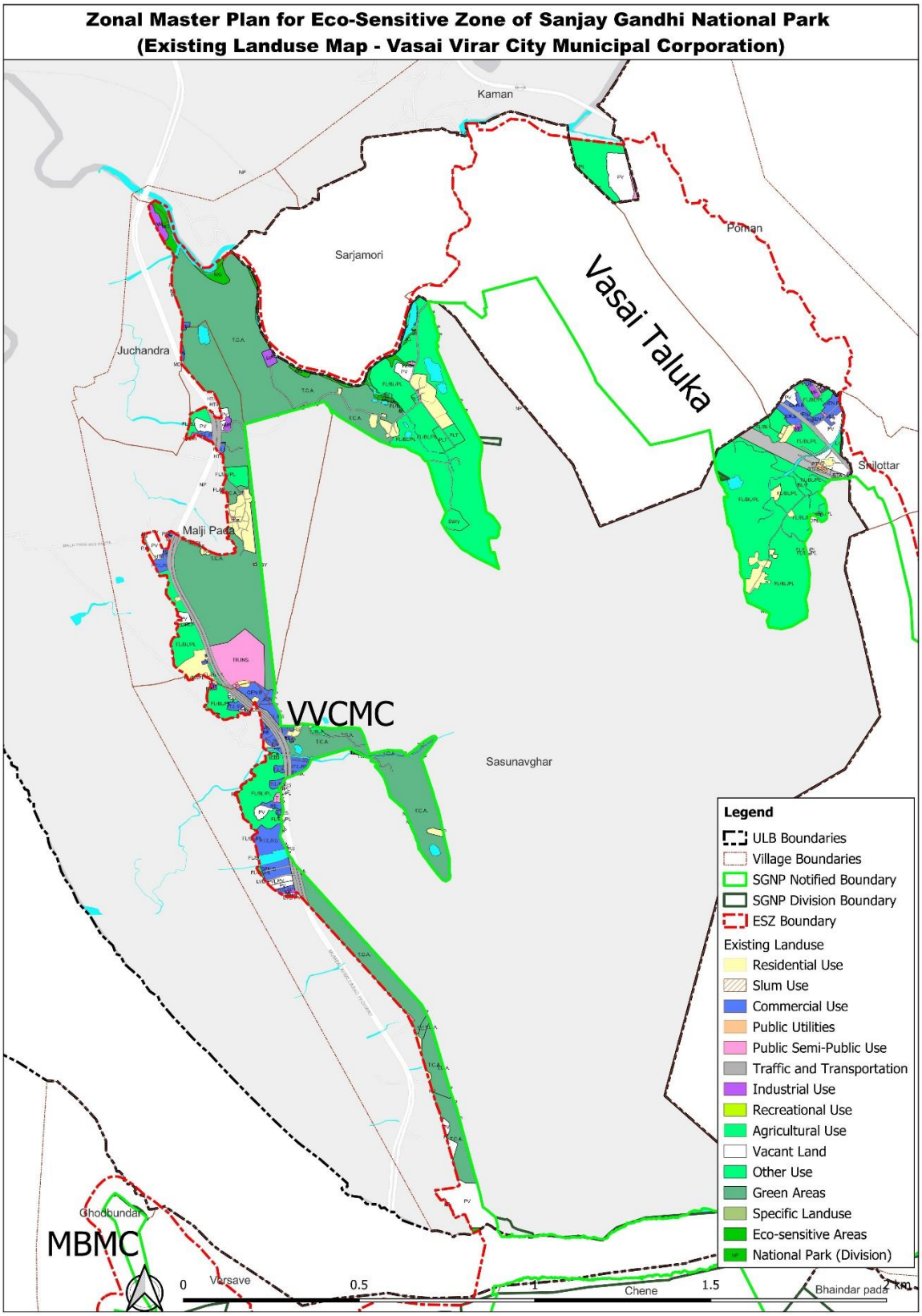
[6] Existing Landuse and Activity survey has been carried out in 2022-23. It has been updated for year 2024-25.

Figure 5.16 Existing Landuse Distribution of Eco-Sensitive Zone of Sanjay Gandhi National Park, VVCMC, 2024



Source: Consultant Analysis

Figure 5.17 Existing Land use Map for Eco-Sensitive Zone for Sanjay Gandhi National Park, 2024, VVCMC



Source: Consultant Analysis

5.9 Detailed Landuse and Activity Distribution, VVCMC

5.9.1 Residential land use

The Residential Use under the ESZ in VVCMC is spread over 14.39 Ha, out of which more than 90% are primarily residential, remaining are Residential and commercial mixed activities. These are activities which are regulated as per the ESZ Notification 2016.

Residential Land use – Sub Class	Total Area (Ha)
Residential/Commercial	0.237
Residential Area/ Colony	14.155
Total	**14.392**

Source: Consultant Analysis

5.9.2 Slums & padas

Within Vasai - Virar City Municipal Corporation limits there are no slums present in the ESZ.

5.9.3 Commercial land use

Within the ESZ lies land of about 15.098 Ha is being utilised for commercial uses such as General Business, Hotel/Lodges or Restaurants and Resorts. The uses are complementing to the Residential use within the ESZ. The table below gives sub class wise Existing Land use.

Commercial Land use - Sub Class	Total Area (Ha)
General Business	6.494
Hotel/ Lodge/ Restaurant	6.972
Informal Shops	0.295
Petrol Pump/ LPG Filling Station	0.060
Private Offices	0.169
Resort	0.904
Retail	0.204
Total	**15.098**

Source: Consultant Analysis

5.9.4 Eco-sensitive area

Mangrove forms part of the eco-sensitive area which is spread across an area of 4.763 Ha. in the Juchandra, Bapane and Sasunavghar village area.

5.9.5 Social Infrastructure

Social infrastructure is a subset of the infrastructure sector and typically includes assets that accommodate social services to people. These include healthcare (medical facilities and ancillary infrastructure), education (schools, universities and student accommodation), and housing.

5.9.5.1 Educational facilities

Educational facilities in existing land use refer to the classification and allocation of land for schools, colleges, universities, and other learning institutions within a given area. These facilities play a crucial role in urban and regional planning as they

influence population distribution, infrastructure development, and community accessibility.

Major training institute, Indian Council of Medical Research in Maljipada is also present.

Educational Facilities – Sub Class	Total Area (Ha)
School	0.031
Training Institute	7.241
Total	**7.27**2

Source: Consultant Analysis

5.9.5.2 Health facilities

Health care services in existing land use refer to the planning and allocation of land for medical and wellness facilities. These facilities are essential for public health, emergency response, and community well-being. Integrating them effectively into urban and regional planning ensures accessibility, efficiency, and sustainability. One primary health care centre is found in the Kaman area under ESZ.

Health Facilities – Sub Class	Total Area (Ha)
Primary/ Community/ Urban Health Centre by ULB. / Govt	0.298
Total	**0.**298

Source: Consultant Analysis

5.9.5.3 Other Public-Semi-Public

A Public & Semi-Public (PSP) Zone in land use planning refers to areas designated for facilities that serve the general public or specific community needs. These zones include essential public services which caters to the public. In this case, Dharamshala is present. The total area under such facility is 0.09 Ha.

Public – Semi-Public Facilities – Sub Class	Total Area (Ha)
Dharamshala	0.086
Total	**0.0**86

Source: Consultant Analysis

5.9.5.4 Religious

Religious places are an essential component of land use planning, categorized under Public and Semi-Public (PSP) zones in many urban and regional plans. These spaces serve as centers for worship, cultural activities, community gatherings, and social services. There are 6 temples that falls in the Eco-Sensitive Zone across VVCMC jurisdiction.

Religious – Sub Class	Total Area (Ha)
Temple	0.500
Total	**0.**500

Source: Consultant Analysis

5.9.5.5 Government property

There is no presence of central government or state government property offices and quarters in VVCMC jurisdiction of ESZ.

5.9.5.6 Recreational use

Recreational places in land use planning refer to areas designated for leisure, sports, cultural activities, and outdoor enjoyment. These spaces contribute to the well-being of communities by promoting physical activity, social interaction, and environmental sustainability. It enhances mental and physical well-being by providing spaces for relaxation and exercise. It also improves the visual appeal of cities and promotes green infrastructure. Parks, Gardens and Playground forms the majority of the portion of the recreational facilities with clubs, gymnasium and others to follow. There are no recreational places present in the Vasai - Virar City Municipal Corporation jurisdiction in ESZ area.

5.9.6 Industrial use

Industrial activities are being carried out in the Eco Sensitive Zone of the SGNP. About 3.012 Ha of land is under Industrial use, some polluting and some Non-Polluting industries. There is presence of industries along the Mumbai-Ahmedabad Highway as well as in the Poman area in Royal Industrial Hub. Industrial Activities are regulated and polluting industrial activities are prohibited in the ESZ. MPCB categorization of industries is given in bracket below.

Industrial - Sub Class	Total Area (Ha)
Manufacturing (Red)	1.885
Other Industries (Red)	0.158
Storage Godown (Green)	0.061
Warehouse (Green)	0.908
Total	**3.012**

Source: Consultant Analysis

5.9.7 Traffic and transportation

A Traffic and Transportation use in existing land use refers to areas designated for transportation infrastructure and movement of people and goods. These includes a network of Internal and Collector Road Network in VVCMC area. Small stretches of Portion of Mumbai-Ahmedabad Highway also form a part of the ESZ.

Traffic and Transportation – Sub Class	Total Area (Ha)
Right of Way	0.807
Roads	12.654
Median/ Divider	1.033
Traffic Island	0.042
Railway Track	4.303
Total	**18.839**

Source: Consultant Analysis

Total length in ESZ in VVCMC is 14.32 Kms with majority of roads having width less than 6 Meters. Width wise Length distribution within ESZ in VVCMC is given below.

Table 5.14 Length of roads as per road widths, VVCMC

S. No	Road Width (Metres)	Length (Km)
1	Upto 6	10.156

2	6-9	1.533
3	9-12	0.185
4	12-15	0.400
5	15-18	0.000
6	18-24	0.800
7	24-30	0.000
8	30 and above	1.241
9	**Grand Total**	**14.315**

Source: Consultant Analysis

5.9.8 Agriculture Use

An Agriculture Zone in existing land use refers to areas designated for farming, livestock rearing, and other agricultural activities. There is a huge presence of fallow/barren/pad land in the Sasunavghar area in VVCMC jurisdiction within the ESZ. 2 plant nurseries are located alongside west of Mumbai-Ahmedabad Highway in Sasunavghar area.

Agriculture Use – Sub Class	Total Area (Ha)
Cropland	3.782
Plantations	1.840
Plant Nursery	0.192
Fallow land/Barren land/ Pad land	101.732
Total	**107.**546

Source: Consultant Analysis

5.9.9 Other Use

This zone consists of area which are Tree Clad, water Bodies and Cow Sheds, Dairy Farm etc. Significant amount of area is covered under green areas under tree which helps in maintaining ecological balance in the Eco-sensitive zone. Waterbodies in forests play a vital role in supporting wildlife by providing drinking water, maintaining biodiversity, and sustaining the ecosystem. Tree Clad Area dominates the other uses in VVCMC in Malji Pada and Sasunavghar area.

Other Zone – Sub Class	Total Area (Ha)
Green Area (Tree Clad Area)	123.312
National Park (Division)	0.194
Protected Forst/Notified Forest	0.003
Water Bodies	8.427
Dairy Farm	1.273
Vacant Land	17.606
Others	1.344
Total	**152.159**

Source: Consultant Analysis

5.9.10 Public Utilities

An area of 0.25 Ha is utilised for the provision of Public Utilities and or Infrastructure. There is no major public utility infrastructure apart from an Electric substation which mark its presence in Sasunavghar in ESZ in VVCMC jurisdiction.

Public Utilities – Sub Class	Total Area (Ha)
Crematorium Burial Ground / Grave Yard	0.028
Electric Sub-Station	0.181
Ground Level Reservoir	0.036
Total	**0.245**

Source: Consultant Analysis

5.10 Existing Land use & Activities – Vasai Taluka

Vasai Taluka covers about 5.5% of area of ESZ. The land use covered in this portion is diverse.

About 80% of the Eco Sensitive Zone extent within the VVCMC jurisdiction consists of undeveloped area i.e having Agricultural uses, natural areas, forest, water bodies and vacant land etc. Fair Amount of Residential, Commercial, Public-Semi Public and Traffic and Transportation cover the developed area.

Table 5.15 Village wise predominant Existing Land use in V**asai Taluka**, 2024

Sr. No	Village	Area	Predominant Land Use
1	Nagale	Nagale	Tree Clad and Agriculture
2	Shillotar	Shillotar	Agriculture
3	Poman	Poman	Industrial
4	Sarjamori	Sarjamori	Mangrove and Agriculture
5	Mori	Mori	Industrial and Agriculture

Source: Consultant Analysis

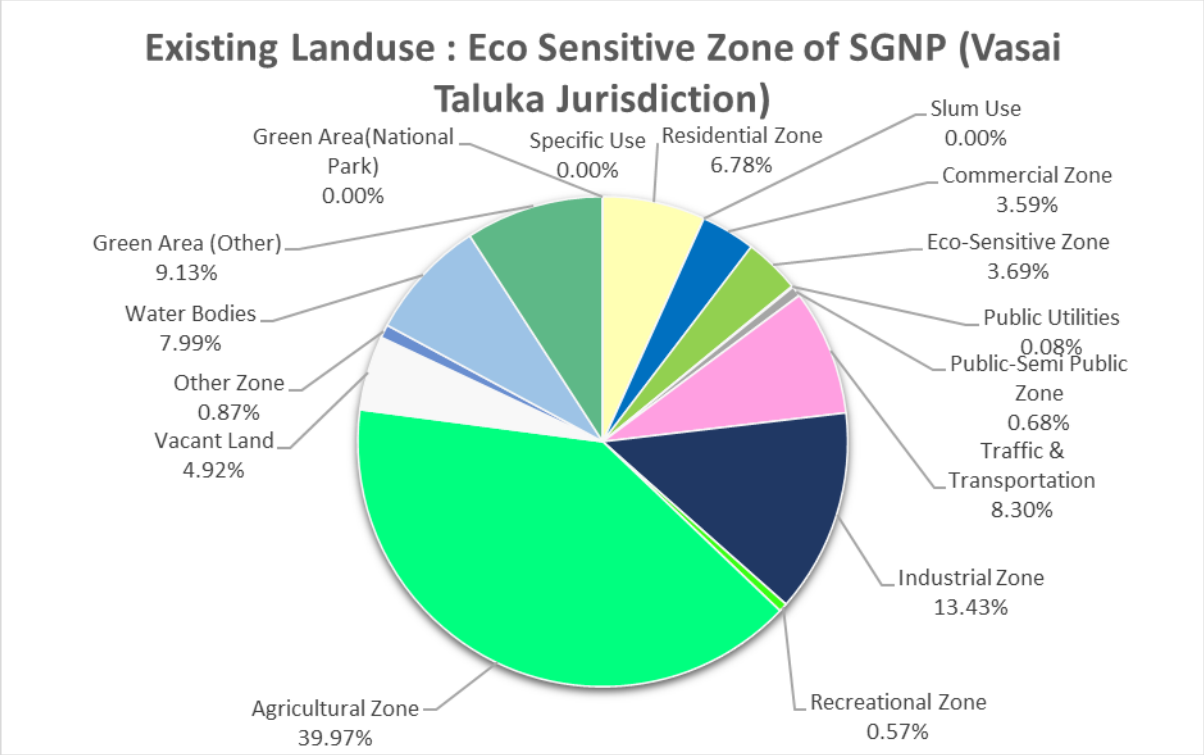
Table 5.16: Existing Land use distribution of Eco-Sensitive Zone of Sanjay Gandhi National Park in Vasai-Taluka jurisdiction, 2024[7]

Land use	Area (Ha)	Percentage of Developed Area	Percentage of Total Area
Residential Use	22.062	18.26%	6.78%
Slum Use	0.000	0.00%	0.00%
Commercial Use	11.694	9.68%	3.59%
Eco-Sensitive Areas	12.025	9.95%	3.69%
Public Utilities	0.273	0.23%	0.08%
Public-Semi Public Use	2.198	1.82%	0.68%
Traffic and Transportation	27.010	22.35%	8.30%
Industrial Use	43.711	36.17%	13.43%
Recreational Use	1.862	1.54%	0.57%
Developed Area	**120.835**	**100.00%**	**37.12%**
Agricultural Use	130.102		39.97%
Vacant Land	15.999		4.92%
Other Use	2.829		0.87%
Water Bodies	26.018		7.99%
Green Area (Forest+NP)	29.727		9.13%
Specific Use	0.000		0.00%
Undeveloped Area	**204.675**		**62.88%**
Total Area	**325.510**		**100.00%**

Source: Consultant Analysis

Figure 5.18: Existing Landuse Distribution of Eco-Sensitive Zone of Sanjay Gandhi National Park, Vasai-Taluka, 2024

[7] Existing Landuse and Activity survey has been carried out in 2022-23. It has been updated for year 2024-25.



Source: Consultant Analysis

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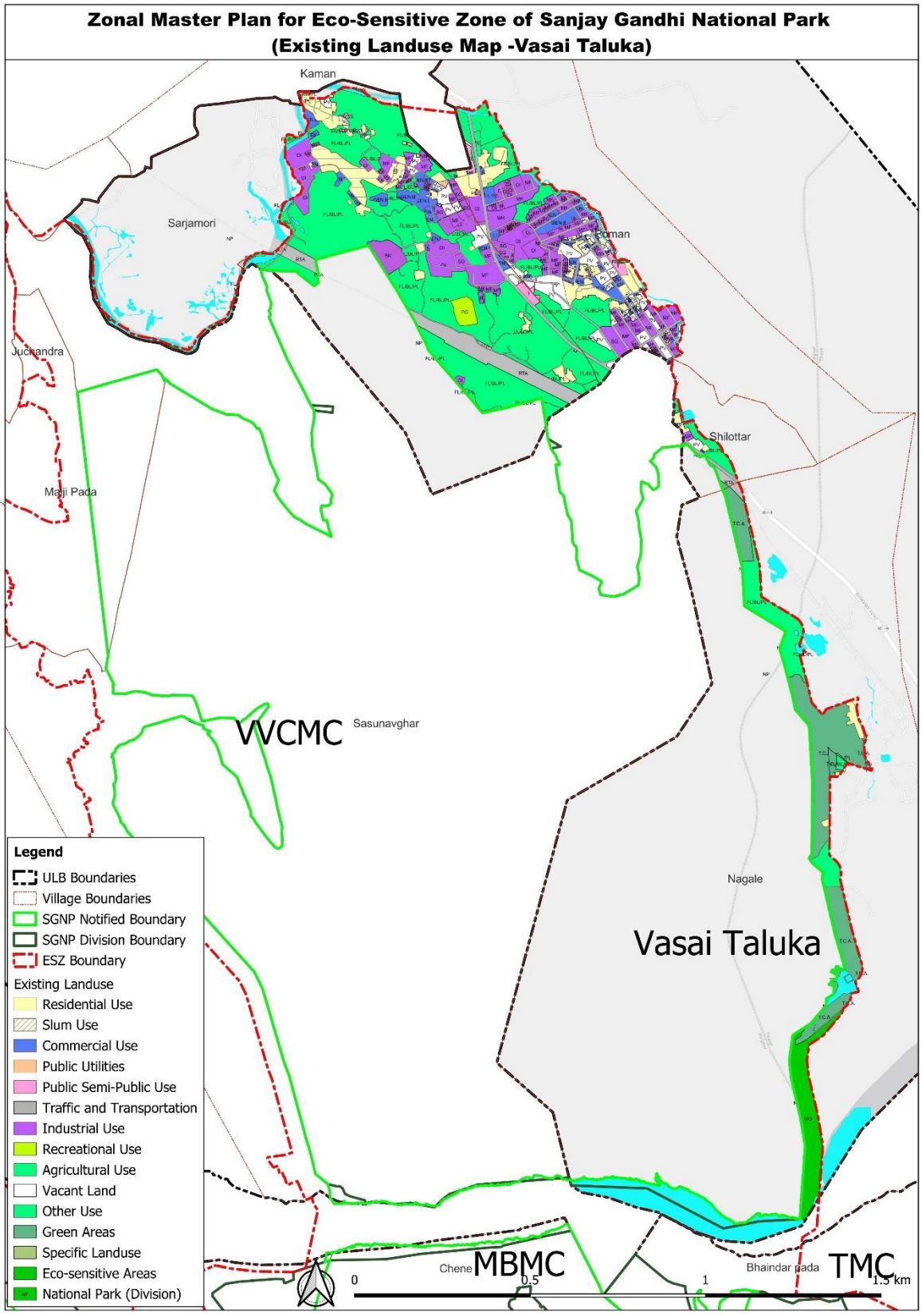
Figure 5.19 Existing Land use Map for Eco-Sensitive Zone for Sanjay Gandhi National Park, 2024, Vasai Taluka



Source: Consultant Analysis

5.11 Detailed Landuse and Activity Distribution, Vasai Taluka

5.11.1 Residential land use

The Residential Use under the ESZ in Vasai Taluka is spread over 22.062 Ha, out of which more than 80% are primarily residential, remaining are Residential and commercial mixed activities. These are activities which are regulated as per the ESZ Notification 2016.

Residential Land use – Sub Class	Total Area (Ha)
Residential/Commercial	4.770
Residential Area/ Colony	17.292
Total	**22.062**

Source: Consultant Analysis

5.11.2 Slums & padas

Within Vasai Taluka limits there are no slums present in the ESZ.s

5.11.3 Commercial land use

Within the ESZ lies land of about 11.694 Ha is being utilised for commercial uses such as General Business, Hotel/Lodges or Restaurants and Retail. The uses are complementing to the Residential use within the ESZ. The table below gives sub class wise Existing Land use.

Commercial Land use - Sub Class	Total Area (Ha)
General Business	10.643
Hotel/ Lodge/ Restaurant	0.883
Retail	0.168
Total	**11.694**

Source: Consultant Analysis

5.11.4 Eco-sensitive area

Mangrove forms part of the eco-sensitive area which is spread across an area of 12.025 Ha. in the **Nagale and Sarajamori** village area.

5.11.5 Social Infrastructure

Social infrastructure is a subset of the infrastructure sector and typically includes assets that accommodate social services to people. These include healthcare (medical facilities and ancillary infrastructure), education (schools, universities and student accommodation), and housing.

5.11.5.1 Educational facilities

Educational facilities in existing land use refer to the classification and allocation of land for schools, colleges, universities, and other learning institutions within a given area. These facilities play a crucial role in urban and regional planning as they influence population distribution, infrastructure development, and community accessibility.

Educational Facilities – Sub Class	Total Area (Ha)
School	0.145
Total	**0.145**

Source: Consultant Analysis

5.11.5.2 Health facilities

Health care services in existing land use refer to the planning and allocation of land for medical and wellness facilities. These facilities are essential for public health, emergency response, and community well-being. Integrating them effectively into urban and regional planning ensures accessibility, efficiency, and sustainability. **One primary health care centre is found in the Poman area under ESZ.**

Health Facilities – Sub Class	Total Area (Ha)
Primary/ Community/ Urban Health Centre by ULB. / Govt	0.496
Total	**0.496**

Source: Consultant Analysis

5.11.5.3 Other Public-Semi-Public

A Public & Semi-Public (PSP) Zone in land use planning refers to areas designated for facilities that serve the general public or specific community needs. These zones include essential public services which caters to the public. In this case, Police Station/Chowki is present. The total area under such facility is 0.023 Ha.

Public – Semi-Public Facilities – Sub Class	Total Area (Ha)
Police Station/Chowki	0.023
Total	**0.023**

Source: Consultant Analysis

5.11.5.4 Religious

Religious places are an essential component of land use planning, categorized under Public and Semi-Public (PSP) zones in many urban and regional plans. These spaces serve as centers for worship, cultural activities, community gatherings, and social services. There are 3 temples that falls in the Eco-Sensitive Zone across Vasai-Taluka jurisdiction.

Religious – Sub Class	Total Area (Ha)
Temple	1.469
Total	**1.469**

Source: Consultant Analysis

5.11.5.5 Government property

There is no presence of central government property office in Vasai-Taluka jurisdiction of ESZ. There is also ---- state government property offices in Vasai-Taluka jurisdiction.

Government Property – Sub Class	Total Area (Ha)
Central Government Property – Office	-
State Government Property – Office	0.065
State Government Property - Quarter	-
Total	**0.065**

Source: Consultant Analysis

5.11.5.6 Recreational use

Recreational places in land use planning refer to areas designated for leisure, sports, cultural activities, and outdoor enjoyment. These spaces contribute to the well-being of communities by promoting physical activity, social interaction, and environmental sustainability. It enhances mental and physical well-being by providing spaces for relaxation and exercise. It also improves the visual appeal of cities and promotes green infrastructure. Parks, Gardens and Playground forms the majority of the portion of the recreational facilities with clubs, gymnasium and others to follow. **There is just 1 playground as recreational places present in the Vasai Taluka.**

Recreational Facilities – Sub Class	Total Area (Ha)
Play Ground	1.862
Total	**1.862**

Source: Consultant Analysis

5.11.6 Industrial use

Industrial activities are being carried out in the Eco Sensitive Zone of the SGNP. About 43.71 Ha of land is under Industrial use, some polluting and some Non-Polluting industries. There is huge amount of manufacturing industries in Poman area in Vasai Taluka. Industrial Activities are regulated and polluting industrial activities are prohibited in the ESZ. MPCB categorization of industries is given in bracket below.

Industrial - Sub Class	Total Area (Ha)
Agro based and Food Processing (Orange)	0.079
Manufacturing (Red)	21.249
Other Industries (Red)	16.566
Storage Godown (Green)	4.276
Warehouse (Green)	1.541
Total	**43.711**

Source: Consultant Analysis

5.11.7 Traffic and transportation

A Traffic and Transportation use in existing land use refers to areas designated for transportation infrastructure and movement of people and goods. These includes a network of Internal and Collector Road Network in Vasai Taluka area. Small stretches of Chinchoti Anjur Phata Marg passes through Vasai Taluka.

Traffic and Transportation – Sub Class	Total Area (Ha)
Right of Way	0.107
Roads	15.166
Traffic Island	0.009
Railway Track	11.728
Total	**27.010**

Source: Consultant Analysis

Total length in ESZ in VT is 25.38 Kms with majority of roads having width less than 6 Metres. Width wise Length distribution within ESZ in VVCMC is given below.

Table 5.17 Length of roads as per road widths, Vasai Taluka

S. No	Road Width (Metres)	Length (Km)
1	Upto 6	17.375
2	6-9	2.203
3	9-12	3.366
4	12-15	2.435
5	15-18	0.000
6	18-24	0.000
7	24-30	0.000
8	30 and above	0.000
9	**Grand Total**	**25.379**

Source: Consultant Analysis

5.11.8 Agriculture Use

An Agriculture Zone in existing land use refers to areas designated for farming, livestock rearing, and other agricultural activities. There is a huge presence of fallow/barren/pad land in the Mori village area in Vasai Taluka jurisdiction within the ESZ.

Agriculture Use – Sub Class	Total Area (Ha)
Cropland	8.957
Fallow land/Barren land/ Pad land	121.145
Total	**130.**102

Source: Consultant Analysis

5.11.9 Specific Use

Under specific land use, No area falls in the VT jurisdiction.

5.11.10 Other Use

This zone consists of area which are Tree Clad, water Bodies and Cow Sheds, Dairy Farm etc. Significant amount of area is covered under green areas under tree which helps in maintaining ecological balance in the Eco-sensitive zone. Waterbodies in forests play a vital role in supporting wildlife by providing drinking water, maintaining biodiversity, and sustaining the ecosystem. Tree Clad Area dominates the other uses in Vasai Taluka where less portion of area falls under National Park area.

Other Use – Sub Class	Total Area (Ha)
Green Area (Tree Clad Area)	29.727
National Park (Division)	0.000
Brick Kiln	2.829
Water Bodies	26.018
Vacant Land	15.999
Total	**74.573**

Source: Consultant Analysis

5.11.11 Public Utilities

An area of 0.273 Ha is utilised for the provision of Public Utilities and or Infrastructure. There is no major public utility infrastructure in ESZ in Vasai-Taluka jurisdiction.

Public Utilities – Sub Class	Total Area (Ha)
Others	0.273
Total	**0.273**

Source: Consultant Analysis

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5.12 Existing Land use & Activities – TMC

Thane Municipal Corporation covers about 19.72 % of area of ESZ. The land use covered in this portion is diverse.

About 75% of the Eco Sensitive Zone extent within the TMC jurisdiction consists of undeveloped area i.e having Agricultural uses, natural areas, forest, water bodies and vacant land etc. Fair Amount of Residential, Commercial, Public-Semi Public, Industrial and Traffic and Transportation cover the developed area.

Table 5.18 Village wise predominant Existing Land use in TMC, 2024

Sr. No	Village	Area	Predominant Land Use
1	Wadwali	Wadwali	Residential
2	Majiwade	Majiwade	Industrial, Defense area
3	Owala	Owala	Tree Clad, Agriculture
4	Kolshet	Kolshet	Tree Clad, Public Utility
5	Chitalsar manpada	Chitalsar manpada	National Park Division and Industrial
6	Boriwade	Boriwade	National Park Division
7	Kavesar	Kavesar	Residential
8	Pachpakhadi	Pachpakhadi	Industrial, Slum
9	Bhaindar pada	Bhaindar pada	National Park Division
10	Yeur	Yeur	Resort, Agriculture

Source: Consultant Analysis

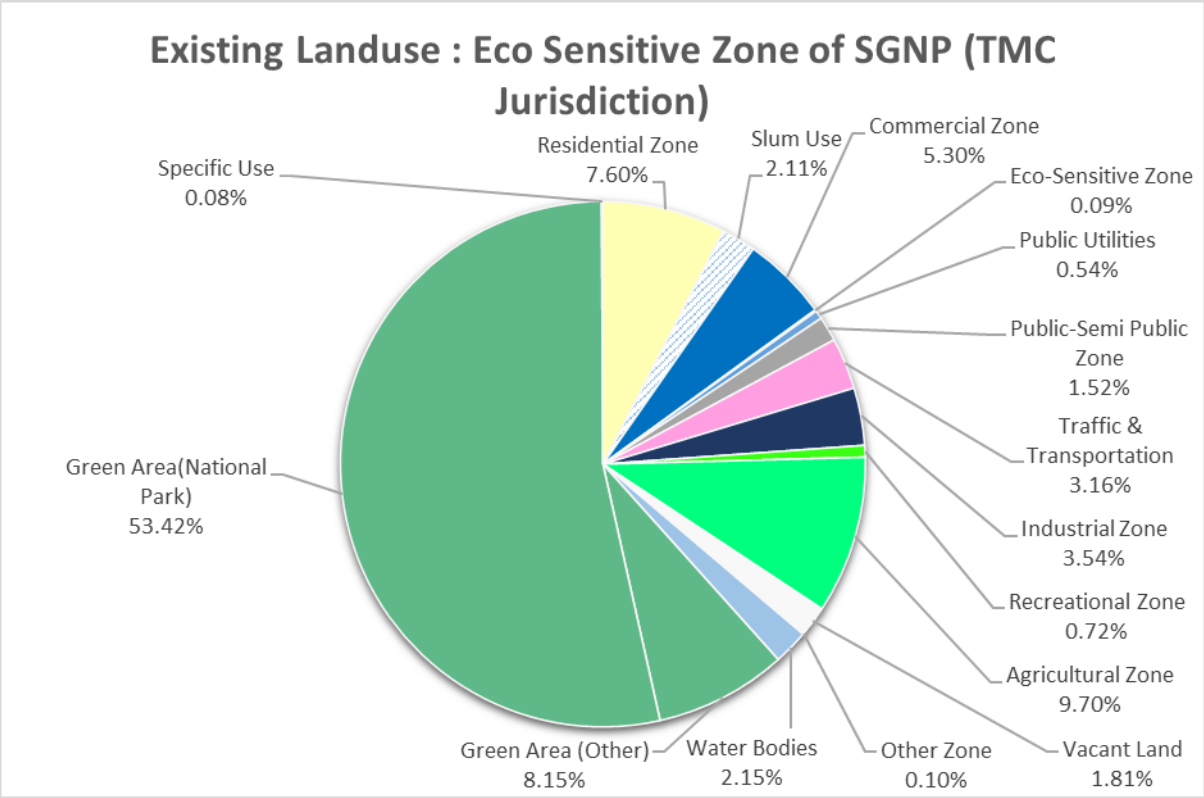
Table 5.19: Existing Land use distribution of Eco-Sensitive Zone of Sanjay Gandhi National Park in TMC jurisdiction, 2024[8]

Land use	Area (Ha)	Percentage of Developed Area	Percentage of Total Area
Residential Use	93.991	30.92%	7.60%
Slum Use	26.068	8.58%	2.11%
Commercial Use	65.557	21.57%	5.30%
Eco-Sensitive Areas	1.102	0.36%	0.09%
Public Utilities	6.619	2.18%	0.54%
Public-Semi Public Use	18.847	6.20%	1.52%
Traffic and Transportation	39.131	12.87%	3.16%
Industrial Use	43.724	14.38%	3.54%
Recreational Use	8.922	2.94%	0.72%
Developed Area	**303.961**	**100.00%**	**24.58%**
Agricultural Use	119.990		9.70%
Vacant Land	22.442		1.81%
Other Use	1.225		0.10%
Water Bodies	26.641		2.15%
Green Area (Forest+NP)	761.278		61.57%
Specific Use	0.983		0.08%
Undeveloped Area	**932.559**		**75.42%**
Total Area	**1236.520**		**100.00%**

[8] Existing Landuse and Activity survey has been carried out in 2022-23. It has been updated for year 2024-25.

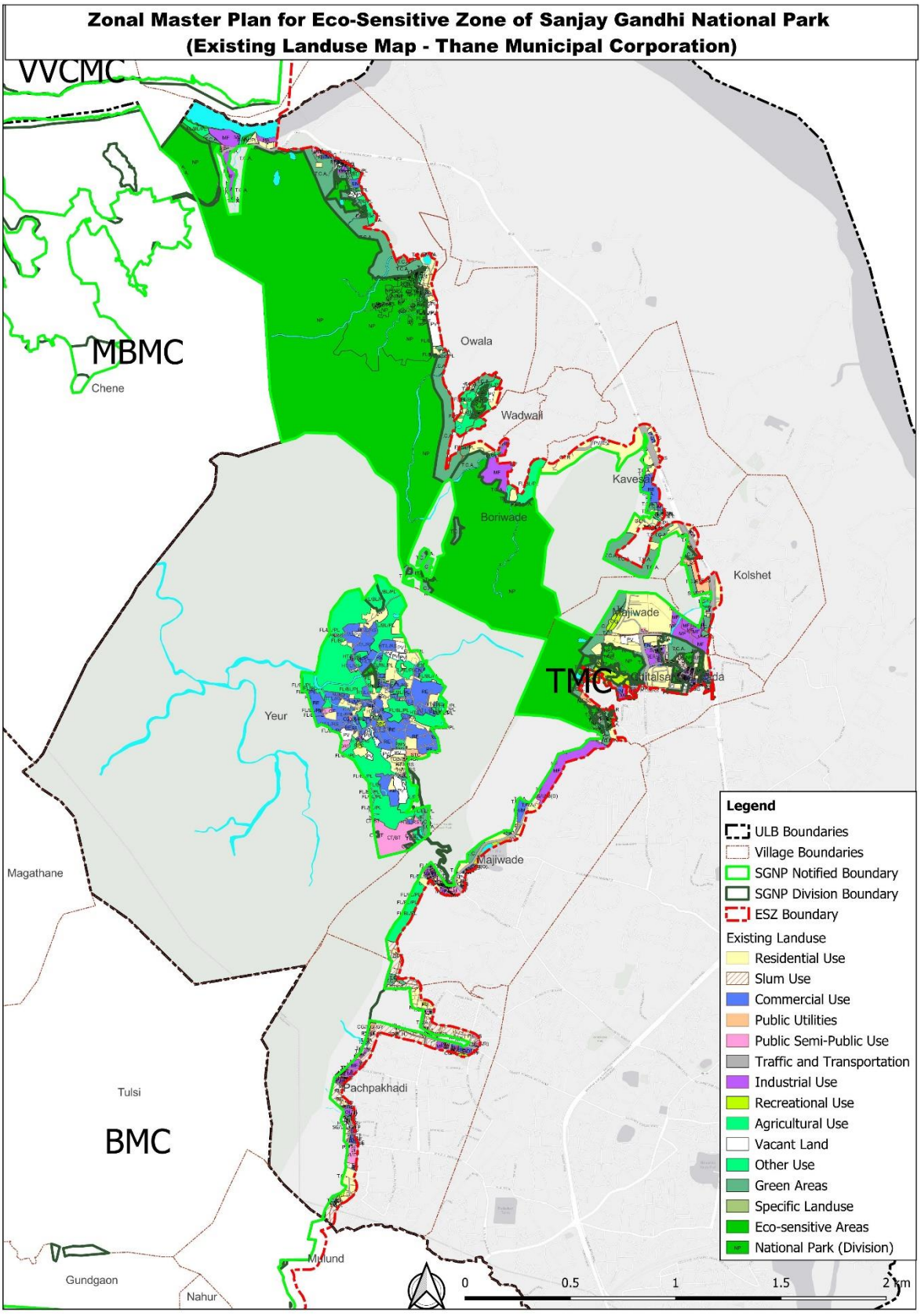
Source: Consultant Analysis

Figure 5.20: Existing Landuse Distribution of Eco-Sensitive Zone of Sanjay Gandhi National Park, TMC, 2024



Source: Consultant Analysis

Figure 5.21 Existing Land use Map for Eco-Sensitive Zone for Sanjay Gandhi National Park, 2024, TMC



Source: Consultant Analysis

5.13 Detailed Landuse and Activity Distribution, TMC

5.13.1 Residential land use

The Residential Use under the ESZ in TMC is spread over 82.68 Ha, out of which more than 90% are primarily residential, remaining are Residential and commercial mixed activities. These are activities which are regulated as per the ESZ Notification 2016.

Residential Land use – Sub Class	Total Area (Ha)
Residential/Commercial	1.396
Residential Area/ Colony	90.507
Township	2.088
Total	**93.991**

Source: Consultant Analysis

5.13.2 Slums & padas

Within TMC limits there are 11 slums present in the ESZ details of which are given in the section 6.4.

Slums	Total Area (Ha)
Slums	26.068
Total	**26.068**

5.13.3 Commercial land use

Within the ESZ lies land of about 64.06 Ha is being utilised for commercial uses such as General Business, Hotel/Lodges or Restaurants and Resorts. The uses are complementing to the Residential use within the ESZ. The table below gives sub class wise Existing Land use.

Commercial Land use - Sub Class	Total Area (Ha)
Function Hall/ Marriage Garden	4.026
General Business	5.954
Hotel/ Lodge/ Restaurant	27.427
Petrol Pump/ LPG Filling Station	0.149
Private Offices	1.214
Resort	26.683
Shopping Centre/ Mall	0.010
Banks	0.094
Total	**65.557**

Source: Consultant Analysis

5.13.4 Eco-sensitive area

Mangrove forms part of the eco-sensitive area which is spread across an area of 1.102 Ha. in the Gaimukh area.

5.13.5 Social Infrastructure

Social infrastructure is a subset of the infrastructure sector and typically includes assets that accommodate social services to people. These include healthcare

(medical facilities and ancillary infrastructure), education (schools, universities and student accommodation), and housing.

5.13.5.1 Educational facilities

Educational facilities in existing land use refer to the classification and allocation of land for schools, colleges, universities, and other learning institutions within a given area. These facilities play a crucial role in urban and regional planning as they influence population distribution, infrastructure development, and community accessibility. A major Government Industrial Training Institute is present in the ESZ area in TMC, There is presence of 8 number of schools also

Educational Facilities – Sub Class	Total Area (Ha)
School	0.967
Anganwadi	0.011
College	0.160
Training Institute	1.696
Total	**2.834**

Source: Consultant Analysis

5.13.5.2 Health facilities

Health care services in existing land use refer to the planning and allocation of land for medical and wellness facilities. These facilities are essential for public health, emergency response, and community well-being. Integrating them effectively into urban and regional planning ensures accessibility, efficiency, and sustainability. There are two govt hospital within ESZ namely Swargiya Meenatai Thakre Prasuti Gruh and ESIC Hospital.

Health Facilities – Sub Class	Total Area (Ha)
Govt. Hospital/ Rural Hospital/ Municipal Hospital	0.310
Primary/ Community/ Urban Health Centre by ULB. / Govt	0.013
Private Hospital	0.323
Total	**0.646**

Source: Consultant Analysis

5.13.5.3 Other Public-Semi-Public

A Public & Semi-Public (PSP) Zone in land use planning refers to areas designated for facilities that serve the general public or specific community needs. These zones include essential public services which caters to the public. There is a defense protected area in form of cantonment/battalion (Air Force Station) in Yeoor.

Public – Semi-Public Facilities – Sub Class	Total Area (Ha)
Cantonment/ Battalion	11.235
Community hall	0.127
Orphanage	0.845
Police Station/Chowki	0.074
Public/ Community Toilet	0.094
Social Welfare Centre	0.024
Total	**12.399**

Source: Consultant Analysis

5.13.5.4 Religious

Religious places are an essential component of land use planning, categorized under Public and Semi-Public (PSP) zones in many urban and regional plans. These spaces serve as centers for worship, cultural activities, community gatherings, and social services. There are 14 temples, 4 mosque, 1 church and 2 gurudwara that falls in the Eco-Sensitive Zone across Thane jurisdiction.

Religious – Sub Class	Total Area (Ha)
Church	0.010
Gurudwara	0.096
Mosque	0.742
Others	0.793
Temple	0.761
Total	**2.402**

Source: Consultant Analysis

5.13.5.5 Government property

There is presence of central government property office TMC jurisdiction of ESZ. There is also state government property offices in TMC jurisdiction. There is Assistant Conservator of Forest office near Yeoor entrance of SGNP in form of Central Govt office. Apart from this, there is Mayor of Thane Bungalow and MSEB Quarters as State Govt properties.

Government Property – Sub Class	Total Area (Ha)
Central Government Property – Office	0.196
State Government Property – Office	0.137
State Government Property - Quarter	0.233
Total	**0.566**

Source: Consultant Analysis

5.13.5.6 Recreational use

Recreational places in land use planning refer to areas designated for leisure, sports, cultural activities, and outdoor enjoyment. These spaces contribute to the well-being of communities by promoting physical activity, social interaction, and environmental sustainability. It enhances mental and physical well-being by providing spaces for relaxation and exercise. It also improves the visual appeal of cities and promotes green infrastructure. Parks, Gardens and Playground forms the majority of the portion of the recreational facilities with clubs, gymnasium and others to follow. Amusement Park, Garden and Sport Centre forms major of recreational areas. There is Tikuji ni wadi present in a form of amusement park within ESZ.

Recreational Facilities – Sub Class	Total Area (Ha)
Amusement/Theme Park	4.775
Garden	2.175
Play Ground	0.173
Sports Centre	0.691
Others	0.780
Park	0.328
Total	**8.922**

Source: Consultant Analysis

5.13.6 Industrial use

Industrial activities are being carried out in the Eco Sensitive Zone of the SGNP. About 43.55 Ha of land is under Industrial use, some polluting and some Non-Polluting industries. There is huge amount of manufacturing industries in Majiwade and Panchpakhadi area in TMC. Industrial Activities are regulated and polluting industrial activities are prohibited in the ESZ. MPCB categorization of industries is given in bracket below.

Industrial - Sub Class	Total Area (Ha)
Agro based and Food Processing (Orange)	0.221
Manufacturing (Red)	38.667
Other Industries (Red)	1.240
Storage Godown (Green)	0.286
Service (Red/Green/Orange)	3.295
Warehouse (Green)	0.015
Total	**43.724**

Source: Consultant Analysis

5.13.7 Traffic and transportation

A Traffic and Transportation use in existing land use refers to areas designated for transportation infrastructure and movement of people and goods. These includes a network of Internal and Collector Road Network in TMC. Proposed Thane Borivali Tunnel starts from TMC. Also, Proposed Gaimukh to Ghodbunder Tunnel is also passing from TMC region.

Traffic and Transportation – Sub Class	Total Area (Ha)
Right of Way	2.309
Roads	35.924
Parking Space/ Area	0.125
Bus stand/ Terminus	0.773
Total	**39.131**

Source: Consultant Analysis

Total length of roads in ESZ in TMC is 36.94 Kms with majority of roads having width less than 6 Metres. Width wise Length distribution within ESZ in VVCMC is given below.

Table 5.20 Length of roads as per road widths , TMC

S. No	Road Width (Metres)	Length (Km)
1	Upto 6	22.086
2	6-9	4.595
3	9-12	3.274
4	12-15	1.032
5	15-18	1.915
6	18-24	1.660
7	24-30	0.348
8	30 and above	2.032

9	**Grand Total**	**36.942**

Source: Consultant Analysis

5.13.8 Agriculture Use

An Agriculture Zone in existing land use refers to areas designated for farming, livestock rearing, and other agricultural activities. There is a huge presence of fallow/barren/pad land in the Majiwade and Yeoor are in TMC jurisdiction within the ESZ.

Agriculture Use – Sub Class	Total Area (Ha)
Cropland	0.154
Plantations	0.366
Plant Nursery	0.362
Fallow land/Barren land/ Pad land	119.108
Total	**119.990**

Source: Consultant Analysis

5.13.9 Specific Use

Under specific land use, there is presence of one sand depot in Gaimukh portion of which falls in the TMC jurisdiction.

Specific Use – Sub Class	Total Area (Ha)
Mining Area	0.983
Total	**0.983**

Source: Consultant Analysis

5.13.10 Other Use

This zone consists of area which are Tree Clad, water Bodies and Cow Sheds, Dairy Farm etc. Significant amount of area is covered under green areas under tree which helps in maintaining ecological balance in the Eco-sensitive zone. Waterbodies in forests play a vital role in supporting wildlife by providing drinking water, maintaining biodiversity, and sustaining the ecosystem. Tree Clad Area and National Park dominates the other uses in TMC.

Other Use – Sub Class	Total Area (Ha)
Green Area (Tree Clad Area)	100.749
National Park (Division)	660.528
Reserved Forest	0.001
Water Bodies	26.641
Dairy Farm	1.225
Vacant Land	22.442
Total	**811.586**

Source: Consultant Analysis

5.13.11 Public Utilities

An area of 6.73 Ha is utilised for the provision of Public Utilities and or Infrastructure.

Public Utilities – Sub Class	Total Area (Ha)

Crematorium Burial Ground / Grave Yard	0.734
Electric Sub-Station	3.247
Ground Level Reservoir	1.007
Satellite and Telecommunication Centre	1.454
Others	0.086
Pump House	0.074
Water Pumping Station	0.017
Total	**6.619**

Source: Consultant Analysis

5.14 Existing Infrastructure in ESZ

The physical Infrastructure is spread across each of the ULB's and ESZ forms a significantly smaller part of each Urban local body, for any kind of holistic analysis. However, the section below gives a detail on the physical infrastructure present within the ESZ. Except for Water supply System, where key and critical infrastructure project are located within the SGNP and its ESZ, for all other Infrastructure the key asset locations are outside the ESZ

5.14.1 Status of Physical Infrastructure

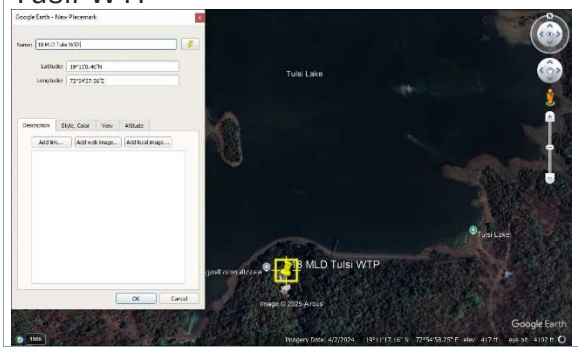
5.14.1.1 Existing and Proposed Water supply Infrastructure in SGNP and ESZ

5.14.1.1.1 Water Treatment Plants and Intake Works

BMC has its three Water Supply assets within the SGNP and the ESZ. One is the Tulsi Water Treatment Plant and other is the Bhandup Water Treatment Complex. Intake and pumping station of Vihar Lake also falls in the ESZ Each of these utilities are critical to the supply of the Potable water to entire Mumbai.

1. The Tulsi Water Treatment Plant (WTP) has been operational since its commissioning in 1985. Covering an area of approximately 2000–2500 square meters, the plant is located within Sanjay Gandhi National Park and is surrounded by dense forests and trees. It is under upgradation currently
2. Intake and pumping station of Vihar Lake for pumping water to inlet bay of Bhandup Complex WTP.

Tusli WTP



Tusli WTP

New 2000 MLD WTP in Bhandup Complex

Intake and pumping stations at Vihar

Source: BMC

5.14.1.1.2 Water Supply Transmission and Distribution Network

BMC conveys water through a system of large trunk pipelines as well as through Water tunnels which pass underneath the SGNP and ESZ supplying water to ESR and GSR across Mumbai BMC supplies Water Supply through a network of Water distribution pipelines. The map below shows the water Supply Network of Mumbai. Total length is 95.111 km in ESZ

MBMC conveys water through a series of pipelines with diameters ranging from 100mm to 400mm in existing water supply network and diameters ranging from 150mm to 600mm in proposed water supply network. Total length of existing water supply line within ESZ in MBMC is 2.47 Km and of proposed water supply line is 1.48 Km.

VVCMC conveys water through a series of pipelines with diameters ranging from 100mm to 150mm in existing water supply network Total length of existing water supply line within ESZ in VVCMC is 1.95 Km

Existing water supply distribution network in ESZ in MBMC	
Diameter of pipe	**Length (Km)**
100mm	0.74
150mm	1.48
200mm	0.07
250mm	0.06
300mm	0.16
400mm	0.16
Total	2.47

Source: MBMC

Proposed water supply distribution network in ESZ in MBMC	
Diameter of pipe	**Length (Km)**
150mm	0.38
200mm	0.25
300mm	0.4
350mm	0.01
600mm	0.44

Total	1.48

Source: MBMC

Existing water supply distribution network in ESZ in VVCMC	
Diameter of pipe	**Length (Km)**
100mm	0.107
150mm	1.841
Total	1.949

Source: VVCMC

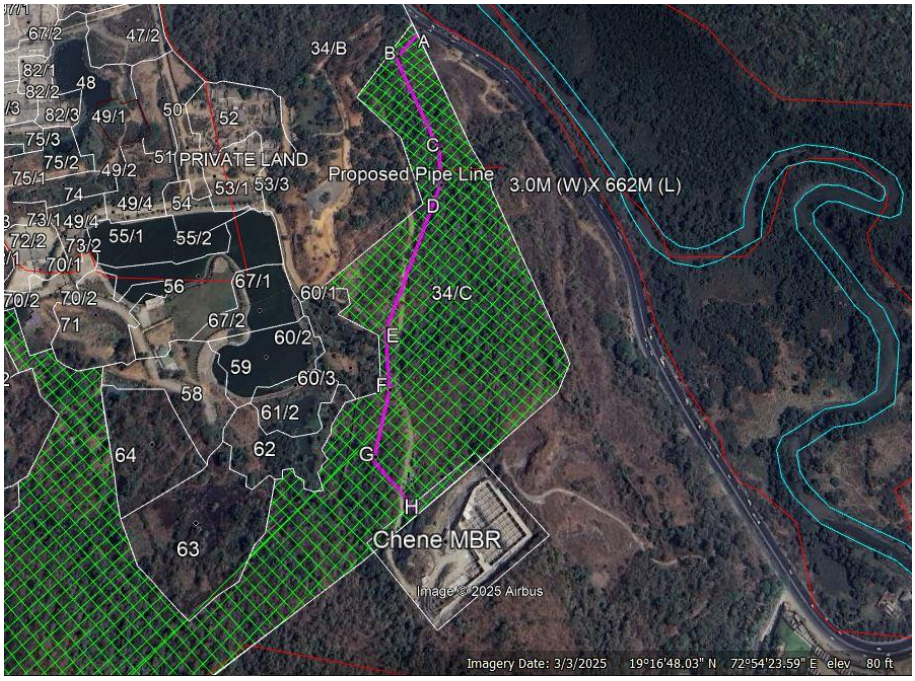
Existing water supply distribution network in ESZ in TMC	
Diameter of pipe	**Length (Km)**
Below 100mm	7.540
100mm	3.808
150mm	3.589
200mm	4.923
250mm	1.630
300mm	2.250
350mm	0.710
400mm	1.750
450mm	1.524
500mm	1.821
600mm	0.631
700mm	0.694
750mm	0.931
900mm	0.996
Total	32.797

Source: TMC

5.14.1.1.3 Proposed water supply infrastructure

1. Bhandup Water Treatment Complex: New 2000 MLD WTP is proposed in Bhandup complex area which currently houses two WTPs of 1910 MLD and 900 MLD capacity.
2. Intake and pumping stations at Vihar Lake.

3. This proposed water supply line connects to the Master Balancing Reservoir present in the Chene village area which fall in the SGNP Forest area.



Source: MBMC

5.14.1.2 Sewerage system

BMC collection the sewerage through a network of Sewer collection network from entire Mumbai including ESZ. The Sewage Treatment Plants and pumping stations are located downstream near the Nallahs and Coastal areas. There are no sewerage assets in ESZ of SGNP. The total length of sewer collection network is 7.52 Km in ESZ

There is very little presence of sewerage system within the ESZ area in MBMC with only approx. 123 meter of sewerage line. Apart from this all-other sewerage line network fall outside ESZ. There are no sewerage assets in ESZ in SGNP in MBMC jurisdiction.

There are no sewerage assets that falls in the VVCMC jurisdiction.

Around 11.017 km of sewage collection network falls in the Eco Sensitive Zone in TMC jurisdiction with pipe dia ranging from 20mm to 450mm.

5.14.1.3 Solid Waste Management

A Construction and Demolition waste processing Plant is located at kokanipada near Dahisar within the ESZ near to an RMC Plant. The C & D waste processed forms and input to the RMC plant. Map shows the location of the Plant.

There is no asset for the purpose of solid waste management falls within the Eco Sensitive Zone in MBMC as well as VVCMC jurisdiction.

There is a Proposed 100 TPD Organic Waste Composter in TMC in Bhaindarpada village.

5.14.1.4 Storm Water Drain

Around 16.45 km of storm water drain falls in the Eco Sensitive Zone in BMC area and around 4.65 km falls in the Eco Sensitive Zone in MBMC area. There is no storm water network in VVCMC jurisdiction in ESZ. Around 14.66 km of closed storm water drains and 11.59 km of open storm water drains are present in ESZ in TMC jurisdiction.

5.14.2 Status of Traffic and Transportation

3 major road networks are used for vehicular movement in ESZ within BMC area to pass across ESZ. These are Aarey Road, proposed Goregaon Mulund Link Road and proposed Thane Borivali twin tunnel project. All other roads end in the Eco Sensitive Zone area and take the traffic in and out of the ESZ area not across the ESZ area.

Total Length of the Aarey Road which passes through the ESZ is 6.82 Km.

Total Length of Goregaon Mulund Link Road which passes though the ESZ area is 2.82 Km. All of this length passes through as a tunnel below the Sanjay Gandhi National Park and does not affect the ESZ. An additional length of 3.83 Km passes below the Forest area of Sanjay Gandhi National Park.

A twin tunnel is also proposed from Thane to Borivali which will passes below the ESZ area.

Also, Western Express Highway passes through the ESZ with a length of 0.5 Km near Borivali.

Total road length within ESZ in BMC is 129.71 Km. More than 90% of the roads have a width less than 12 meters and are primarily collector roads in BMC.

Also, Western Express Highway passes through the ESZ with a length of 1.19 Km in MBMC.

Ghodbunder road of approx. 3.4 Km length passes through ESZ in MBMC jurisdiction.

Total road length within ESZ is 27.87 Km. More than 90% of the roads have a width less than 12 meters and are primarily collector roads in MBMC.

Mumbai-Ahmedabad Highway of approx. 2.04 Km length passes through ESZ in VVCMC jurisdiction. Around 0.804 Km of Virar Alibag MMC corridor passes through VVCMC.

Total length in ESZ in VVCMC is 14.32 Kms with majority of roads having width less than 6 Metres. Width wise Length distribution within ESZ in VVCMC is given below.

Chinchoti-Anjur Phata Marg passes through the Vasai Taluka Region. Total length in ESZ in Vasai Taluka is 25.38 Kms with majority of roads having width less than 6 Metres. Around 2.572 Km of Proposed Virar Alibag MMC corridor passes through Vasai Taluka whereas 1.938 Km of Proposed Mumbai Ahmedabad High Speed Rail passes through Vasai Taluka.

Total length in ESZ in TMC is 36.94 km with majority of roads bring less than 6 metres in width.

Table 5.21 Road lengths as per width in ESZ

Length in KM							
S. No	**Road Width (Metres)**	**BMC**	**MBMC**	**VVCMC**	**VasaiTaluka**	**TMC**	**Total**
1	0-6	66.318	13.088	10.156	17.375	22.086	129.023
2	6-9	39.812	6.671	1.533	2.203	4.595	54.814
3	9-12	16.620	2.358	0.185	3.366	3.274	25.803
4	12-15	3.600	0.788	0.400	2.435	1.032	8.255
5	15-18	2.152	0.323	0.000	0.000	1.915	4.390
6	18-24	0.504	2.483	0.800	0.000	1.660	5.447
7	24-30	0.228	1.467	0.000	0.000	0.348	2.043
8	30 and above	0.478	0.690	1.241	0.000	2.032	4.441
9	**Grand Total**	**129.712**	**27.868**	**14.315**	**25.379**	**36.942**	**234.216**

Source: Consultant Analysis

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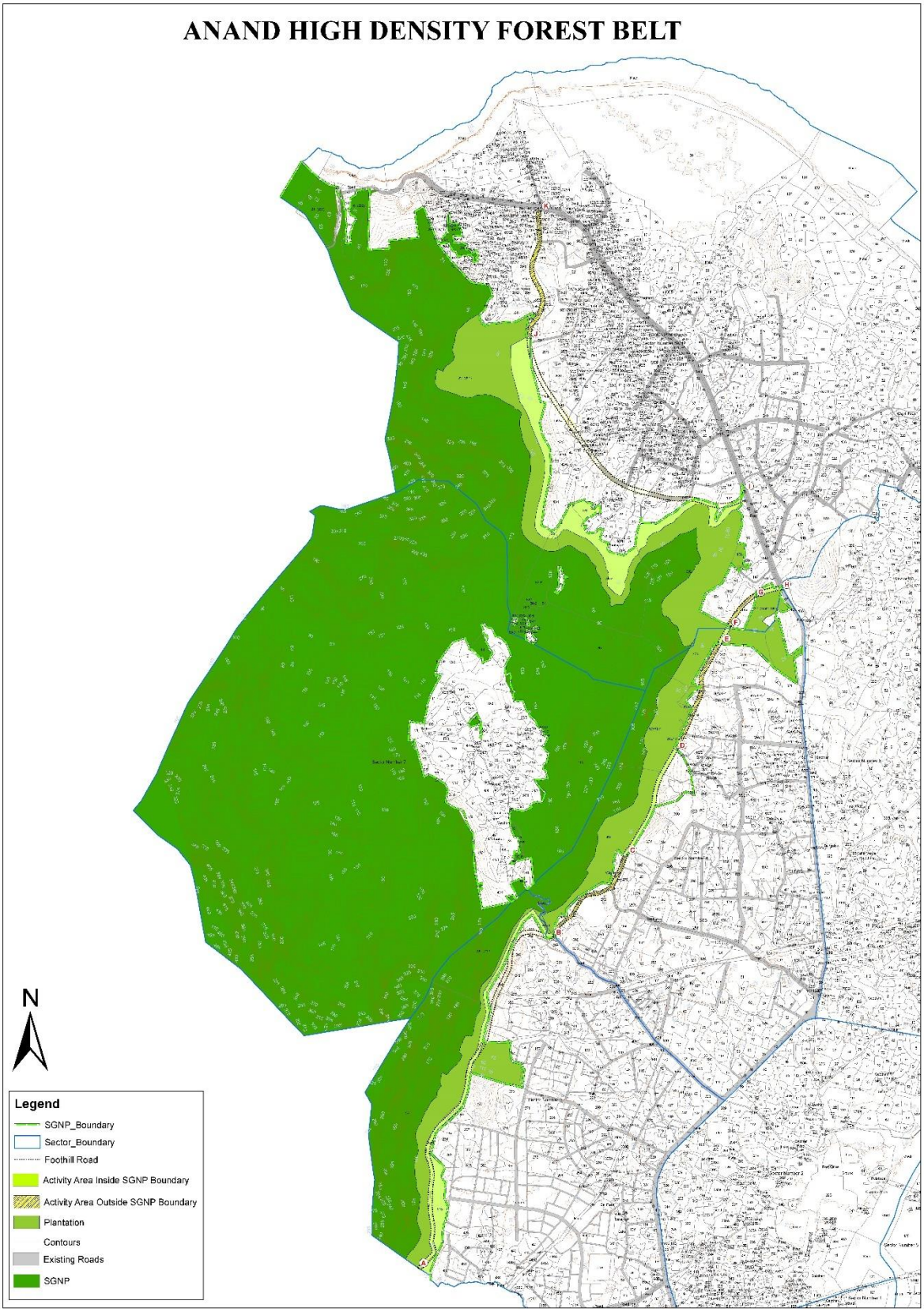
5.14.3 Proposal within New Development Plans



Source: Thane Municipal Corporation

TMC has proposed green belt around SGNP named Anandwan. This anandwan green belt will act as a buffer to SGNP.

The "TMC Green Belt" refers to a proposed project by the Thane Municipal Corporation (TMC) to develop a green belt along the periphery of Sanjay Gandhi National Park (SGNP) Anandwan. This project is part of a larger effort to create a buffer zone around SGNP, potentially acting as a barrier against urban encroachment and providing recreational spaces. The "Anandwan" mentioned is likely a location within that proposed green belt area.

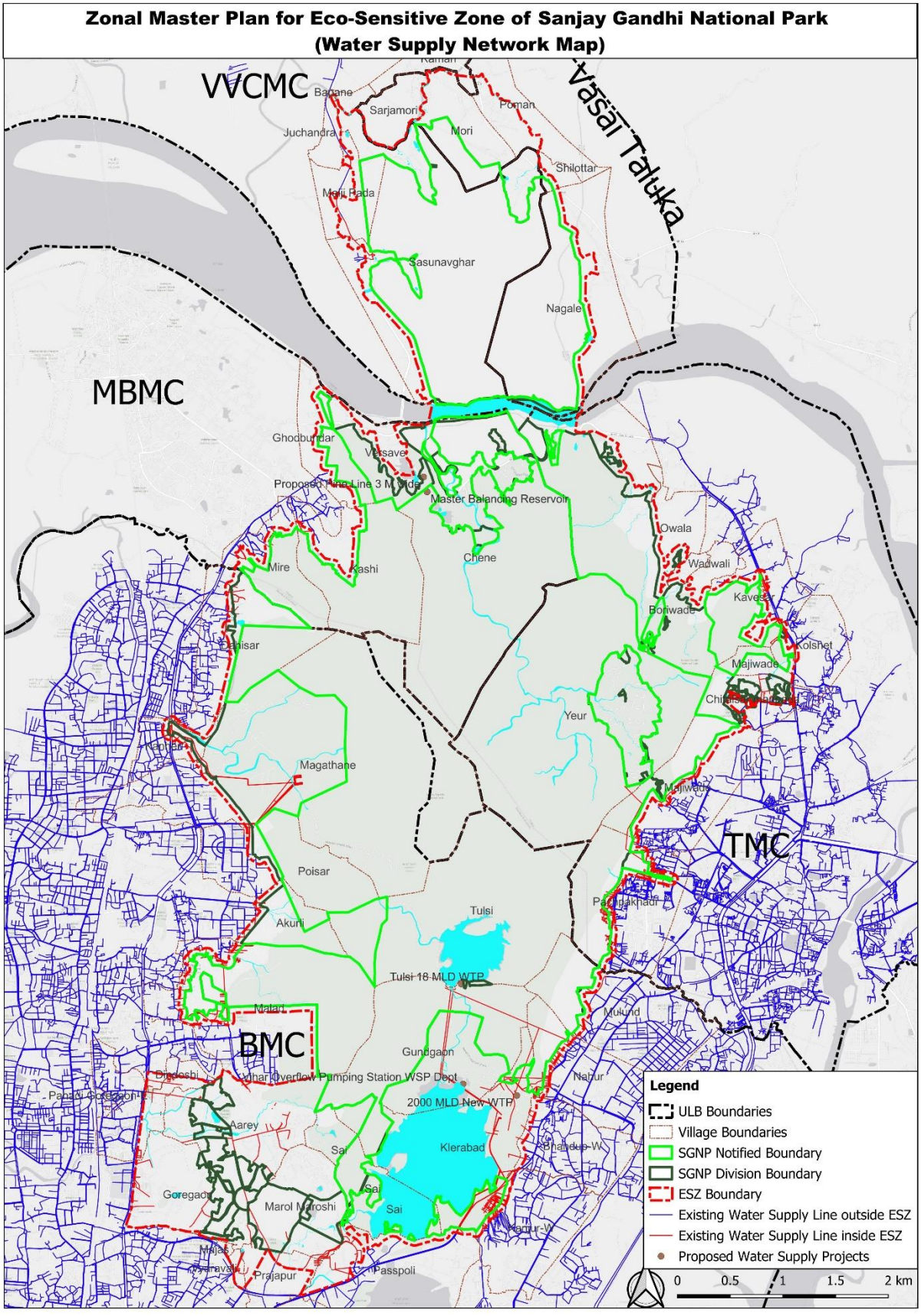
As part of the proposals within Thane Municipal Corporation region, Anand High Density Forest Belt has been provided within and outside the SGNP Boundary of around 305 Ha area with area for Tourism activities in the form of nature trails of about 108 Ha.

Area Statement for Anand High Density Forest Belt

Sr No	Sector No	Section Of Linear Belt	Chainage (Km)		Area ForTourism Activities (Ha)Nature Trails	Area for Plantataion (Ha)
1	3	Warli Pada (A) to SGNP Yeoor Gate (B)	0 - 4.3	Inside SGNP Boundary	28	57
2	4	SGNP Yeoor Gate (B) to Gawand Baug (C)	4.3 - 5.4	Outside SGNP Boundary	4	93
3		Gawand Baug (C) to Kokanipada (D)	5.4 - 6.5	Inside SGNP Boundary	6	
4		Kokanipada (D) To SGNP Tikuji Ni Wadi Gate (E)	6.5 - 7.6	Outside SGNP Boundary	5	
5		(E) to (F)	7.6 - 7.8	Inside SGNP Boundary	1	
6	6	(F) to (G)	7.8 - 9.2	Outside SGNP Boundary	2	155
7		(G) to New Thane Park (H)	9.2 - 9.5	Inside SGNP Boundary	1	
8		Suraj Water Park (I) to Cosmos Hawaiian Bunglow (J)	9.5 - 17.1	Inside SGNP Boundary	57	
9		Cosmos Hawaiian Bunglow (J) to Godrej Emerald, Thane (K)	17.1 - 18.4	Outside SGNP Boundary	5	
				Total	**108**	**305**

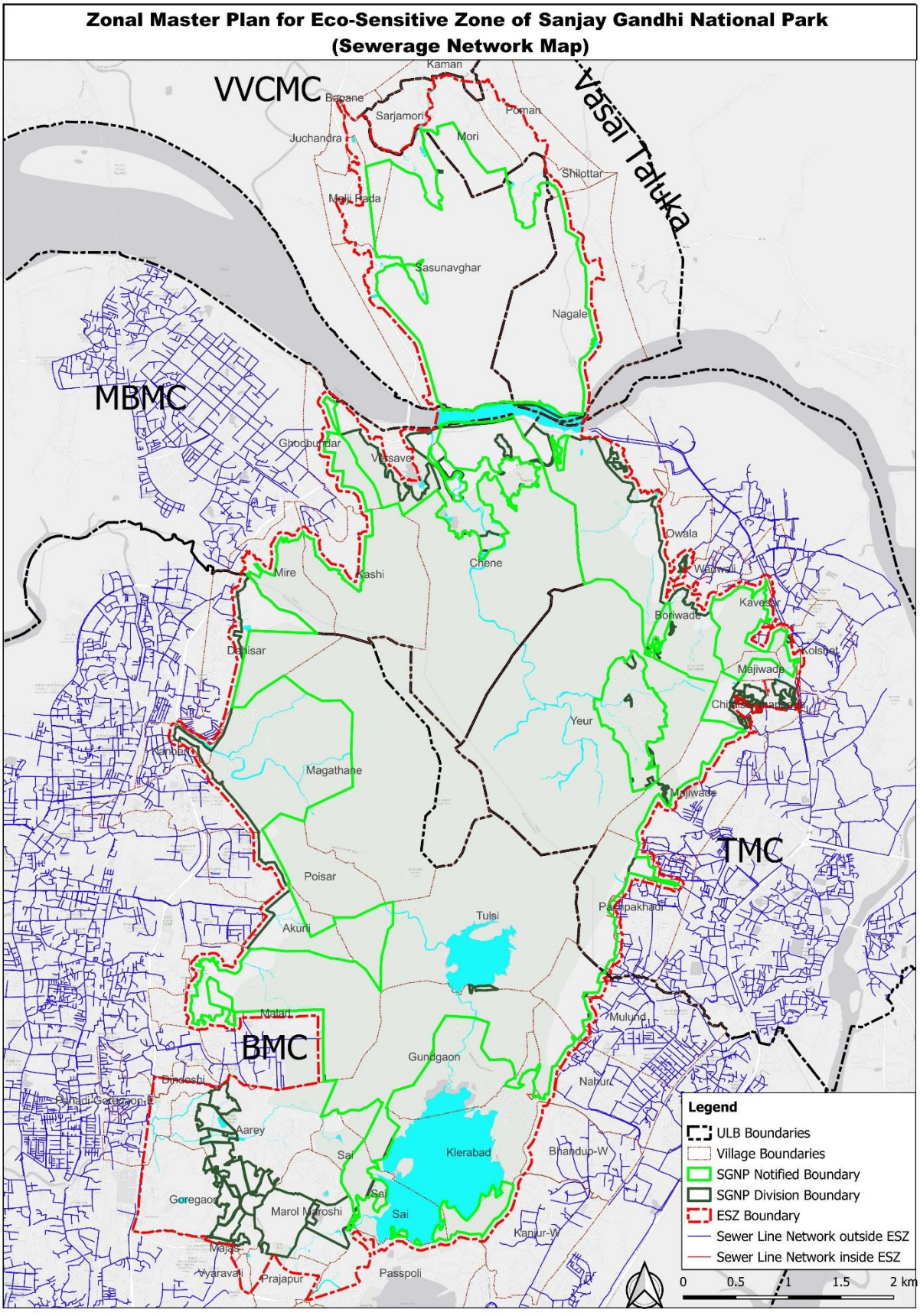
Source: Thane Municipal Corporation

Figure 5.22: Water supply Network in ESZ



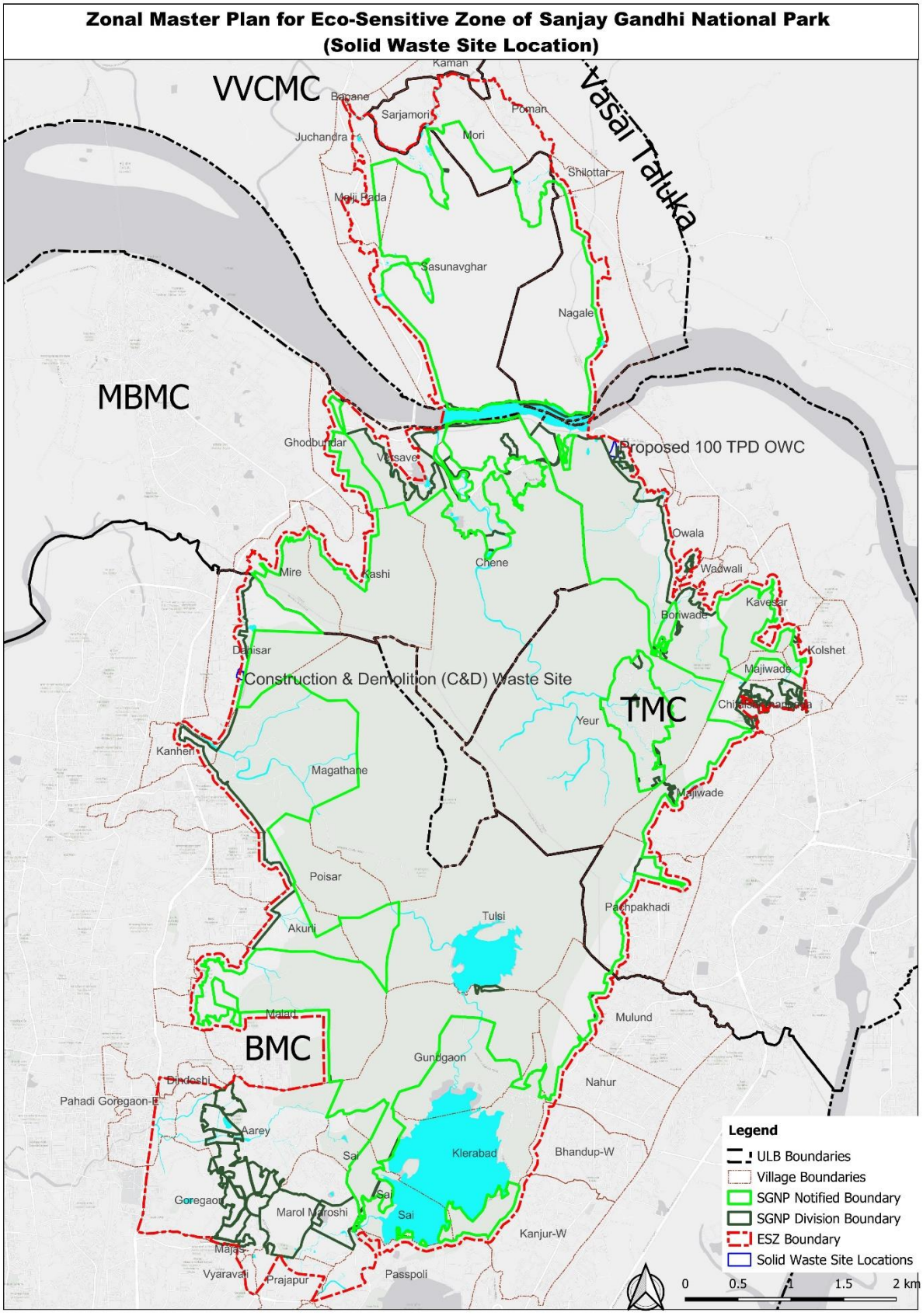
Source: BMC, MBMC, VVCMC and TMC 2024

Figure 5.23: Sewerage Network in ESZ



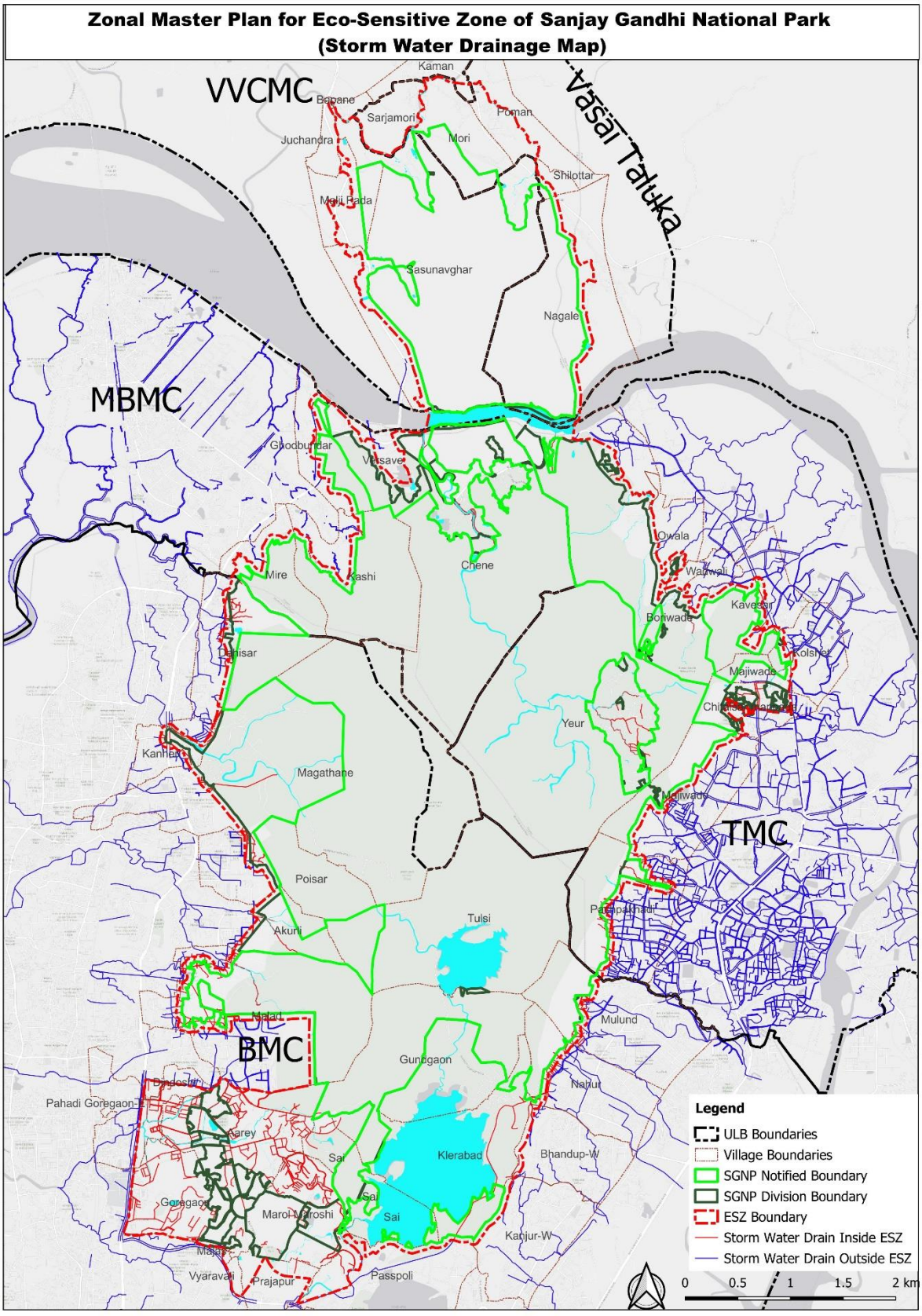
Source: BMC, MBMC, VVCMC and TMC 2024

Figure 5.24: Location of the Solid waste Infrastructure in ESZ, BMC



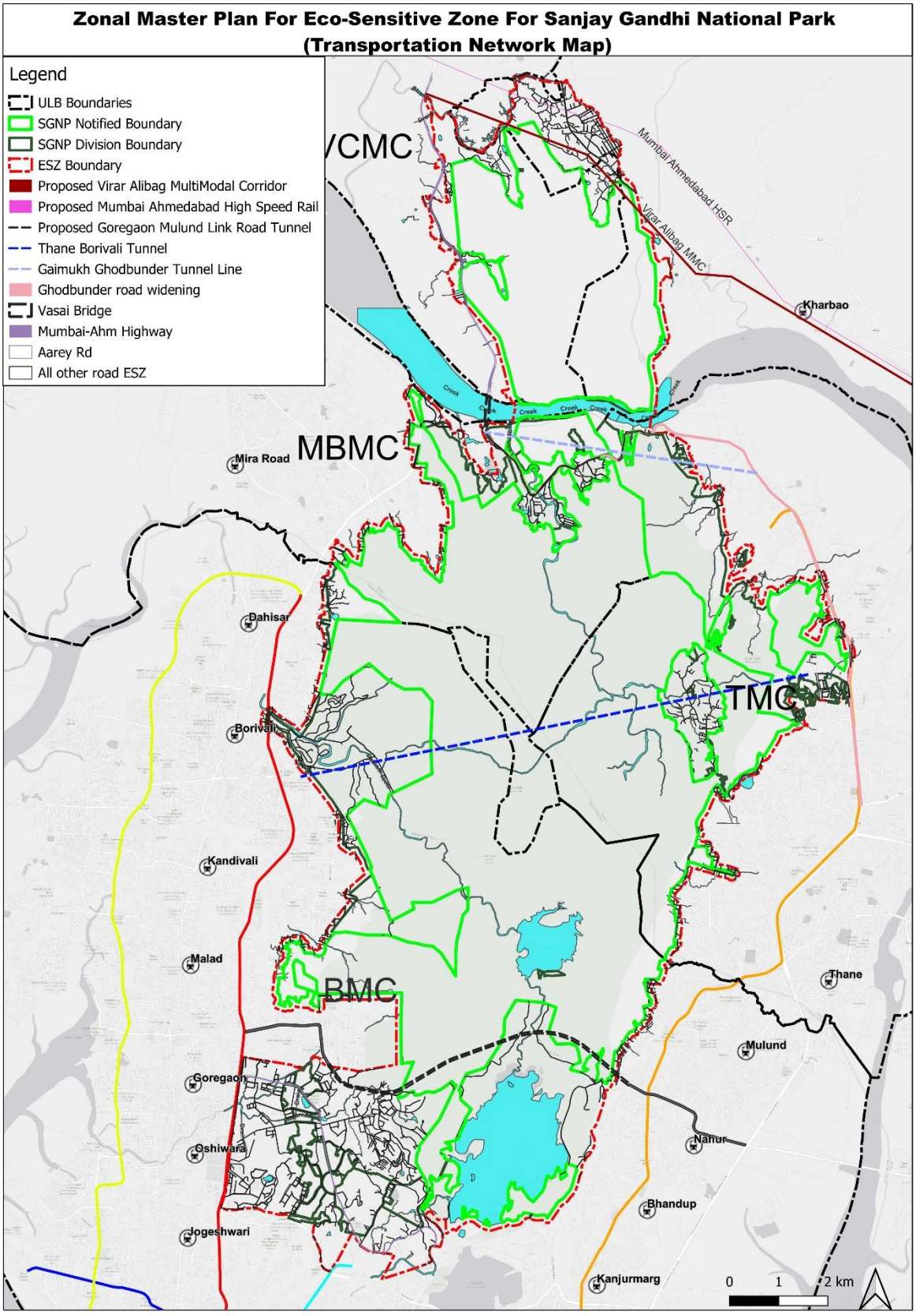
Source: BMC, TMC 2024

Figure 5.25 Storm water drain network within ESZ



Source: BMC, MBMC, VVCMC and TMC 2024

Figure 5.26: Transportation network within ESZ



Source: Consultant Analysis

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6 DATA ANALYSIS AND VULNERABILITY IN ESZ

This section consists of conflicts based on the existing land use activities that are being carried out conflicts due to human animal interaction and determination of the vulnerability of the ESZ with respect to its existing conditions using the Multi Criterion Decision making approach. The section builds upon the information collected from lands use and other sources.

6.1 Activities Carried out within ESZ

Based on the activity classification provided in the ESZ notification 2016, 54.63% of the area under the ESZ falls under Promoted category uses, as per the Existing land use survey. 40.64% activities are under Regulated category and around 5% activities by area under the Prohibited category.

Table 6.1: Category wise Activity analysis within ESZ, as per ESZ notification

Type of Activities	Land Area in Hectare	% Share
Prohibited	256.833	4.32%
Promoted	3143.387	52.87%
Regulated	2545.380	42.81%
Total	**5945.600**	**100%**

Source: Consultant Analysis

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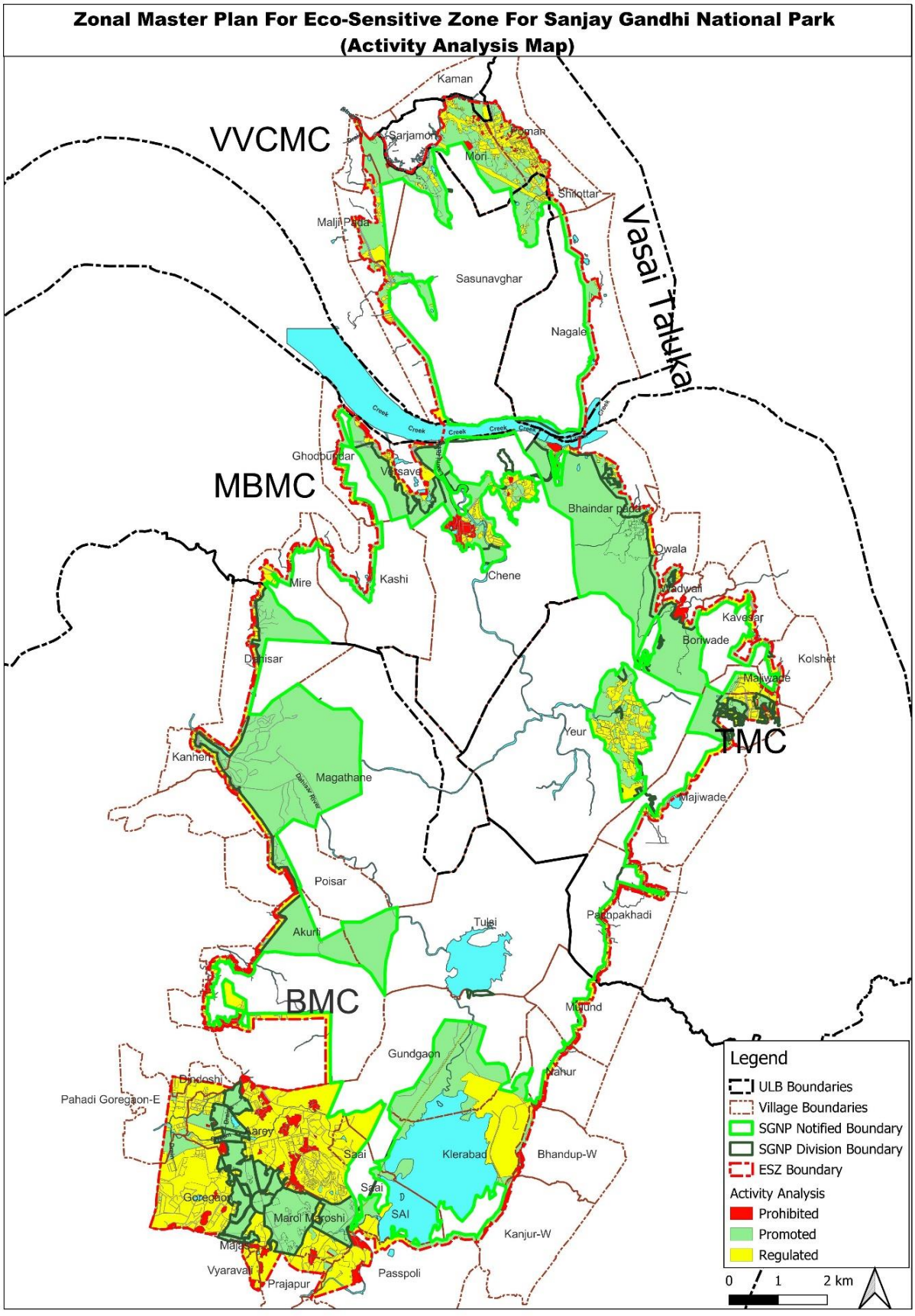
Figure 6.1 Activity Analysis Map



Source: Consultant Analysis

Table 6.2: Category wise Activity analysis within ESZ, as per ESZ notification, BMC 2024

Type of Activities	Land Area in Hectare	% Share
Prohibited	162.165	4.58%
Promoted	1580.846	44.73%
Regulated	1790.849	50.69%
Total	**3533.860**	**100%**

Source: Consultant Analysis

Table 6.3: Category wise Activity analysis within ESZ, as per ESZ notification, MBMC 2024

Type of Activities	Land Area in Hectare	% Share
Prohibited	39.383	8.49%
Promoted	264.91	57.10%
Regulated	159.637	34.41%
Total	**463.930**	**100%**

Source: Consultant Analysis

Table 6.4: Category wise Activity analysis within ESZ, as per ESZ notification, VVCMC 2024

Type of Activities	Land Area in Hectare	% Share
Prohibited	0.814	0.25%
Promoted	237.633	73.30%
Regulated	85.763	26.45%
Total	**324.210**	**100%**

Source: Consultant Analysis

Table 6.5: Category wise Activity analysis within ESZ, as per ESZ notification, Vasai Taluka 2024

Type of Activities	Land Area in Hectare	% Share
Prohibited	9.963	3.06%
Promoted	173.813	53.40%
Regulated	141.734	43.54%
Total	**325.510**	**100%**

Source: Consultant Analysis

Table 6.6: Category wise Activity analysis within ESZ, as per ESZ notification, TMC 2024

Type of Activities	Land Area in Hectare	% Share
Prohibited	44.508	3.60%
Promoted	886.185	71.67%
Regulated	305.827	24.73%
Total	**1236.520**	**100.00%**

Source: Consultant Analysis

6.2 Challenges & Threats to Wildlife

The wildlife in this area faces several threats, primarily due to habitat destruction caused by encroachment and illicit tree felling. Mining activities, particularly stone quarrying near the park's boundaries, further disrupt the natural habitat. Human-wildlife conflict, especially involving leopards, remains a significant challenge, often leading to dangerous encounters. Additionally, the lack of sufficient space, along with garbage accumulation and the presence of domestic animals in peripheral areas, forces young leopards to stray beyond the protected zone, increasing their mortality

risk due to road accidents and other hazards. The presence of 39 tribal settlements (padas) within the SGNP also contributes to disturbances, further impacting the surrounding wildlife and their ecosystem.

6.2.1 Encroachments and informal settlements

Encroachments and informal settlements around Sanjay Gandhi National Park (SGNP) pose one of the most serious threats to its ecological integrity. The Park, situated in the heart of the Mumbai Metropolitan Region, is surrounded by rapidly expanding urban settlements. With over 3 million people living on its fringes, pressure on the park's boundaries has intensified, leading to unauthorized construction and clearing of forest land for housing, agriculture, and infrastructure. These encroachments often occur on land acquired under the Maharashtra Private Forest (Acquisition) Act, 1975, and the Land Acquisition Act, 1894 (amended 1968), where demarcation and enforcement remain weak.

Many of these settlements have evolved into densely populated slums or "hutments," often lacking basic services and formal recognition. As population densities rise, new dwellings continue to push further into the park's buffer and even core zones. This expansion not only reduces forest cover but also fragments wildlife habitats, increases human-wildlife conflict, and degrades ecosystem services. Despite legal action—including Writ Petition No. 305/1995 by the Bombay Environmental Action Group (BEAG)—and various court orders, enforcement remains inconsistent. Encroachments continue to spread, undermining conservation efforts and threatening the long-term sustainability of one of India's most unique urban forests. *(FMP, SGNP, 2024-25 to 2033-34)*

6.2.2 Human-wildlife conflict and conservation challenges

The incidence of human animal conflict in this area is notably high, particularly involving leopards. As leopards stray outside the forest, the dense human settlements surrounding SGNP, both authorized and unauthorized, lead to panic among residents. Several factors contribute to this conflict, including a high leopard population along the park's periphery, their reliance on stray and domestic dogs as primary prey, and the presence of solid waste and garbage, which attract stray dogs and pigs—ultimately drawing leopards into human-inhabited areas.

Due to the large human population in and around the park, leopard attacks on humans have occurred, with the issue becoming particularly severe in 2003-04. However, since then, incidents have declined, with only one reported attack in 2007. Nearly 70% of leopard attacks have taken place within the park, primarily due to the unrestricted movement of encroachers, even during late-night and early-morning hours when leopards are active. Ensuring protection for individuals inside the park under such circumstances remains a significant challenge.

6.2.3 Illegal activities (deforestation, poaching)

Illicit tree felling is a frequent concern, particularly in the Nagla round of the Yeur range. In some cases, this activity is carried out in an organized manner, making it difficult for field staff to prevent such incidents. There have also been instances where

timber thieves have attacked staff attempting to stop illegal logging. To address this issue, group patrolling has been initiated.

Poaching of wild animals and plants is not a significant problem in the area. Unauthorized collection of medicinal plants, orchids, and other flora for commercial purposes has not been observed. However, past cases of poaching, primarily involving tribal communities and encroachers, have been recorded.

Grazing by cattle and livestock in the park is minimal and does not pose a major management challenge. The tribal communities residing within the park do not rear livestock, and there are no cattle camps inside the park. While cattle from nearby areas occasionally graze on the park's outer fringes, they do not venture deep into the forest. Grazing within the park's notified area is strictly prohibited under the Wildlife (Protection) Act, 1972.

No formal extraction of fuel, fodder, or minor forest produce takes place within the division. However, tribal communities and encroachers residing within and around the park illegally collect fuelwood, fodder, and minor forest products such as Tad fruits for their daily sustenance.

6.2.4 Waste management

Waste disposal remains one of the most pressing challenges in this area, particularly due to the presence of numerous labour sheds and tribal settlements (padas). The accumulation of solid waste, particularly in and around the park's periphery, attracts stray dogs and other scavengers, which in turn disrupts the natural food chain and increases human-wildlife conflict, particularly with leopards. Improper waste disposal by nearby settlements, encroachers, and visitors further exacerbates the issue, leading to habitat degradation and contamination of water sources. Additionally, the high footfall of visitors contributes to noise pollution, littering, and disturbances to the park's flora and fauna. Krishnagiri Upvan faces severe environmental threats from plastic pollution, as plastic usage within the park has been significantly high.

6.2.5 Mining

In past, numerous stone quarries have operated in close proximity to the outer boundaries of SGNP, causing significant environmental degradation. Continuous and large-scale quarrying activities have led to extensive landscape destruction, deforestation, and loss of wildlife habitat. Additionally, these operations have resulted in severe air and noise pollution, soil erosion, and the depletion of fertile topsoil. Blasting activities associated with quarrying pose a considerable threat to both human safety and wildlife, further exacerbating ecological disturbances in the region.

6.2.6 Fire Hazard

Forest fires pose a significant threat to Sanjay Gandhi National Park (SGNP), particularly during the dry months of April and May, with some incidents occurring as early as November. These fires are predominantly anthropogenic, often resulting from human activities. The Park has experienced substantial losses due to such fires; between 2009 and 2013, over 43,000 acres of forest land were affected in the Thane circle of SGNP. A notable factor contributing to the increased fire hazard is the

gregarious flowering of bamboo species within the park. In 2007 and 2008, extensive flowering of Katang bamboo (*Bambusa arundinacea*) and Manvel bamboo (*Dendrocalamus strictus*) was observed across approximately 103.68 square kilometers of SGNP. Post-flowering, these bamboo species naturally die off, leaving behind large quantities of dry biomass that serve as highly flammable material, significantly elevating the risk of forest fires. The accumulation of this dry bamboo biomass has led to severe fire incidents in subsequent years, notably during the fire seasons of 2010 and 2011, resulting in extensive damage to the forest ecosystem. Despite the park's status as a protected area under the Wildlife Protection Act of 1972, which restricts the removal of dead bamboo, the management has recognized the necessity of addressing this issue to mitigate fire risks.

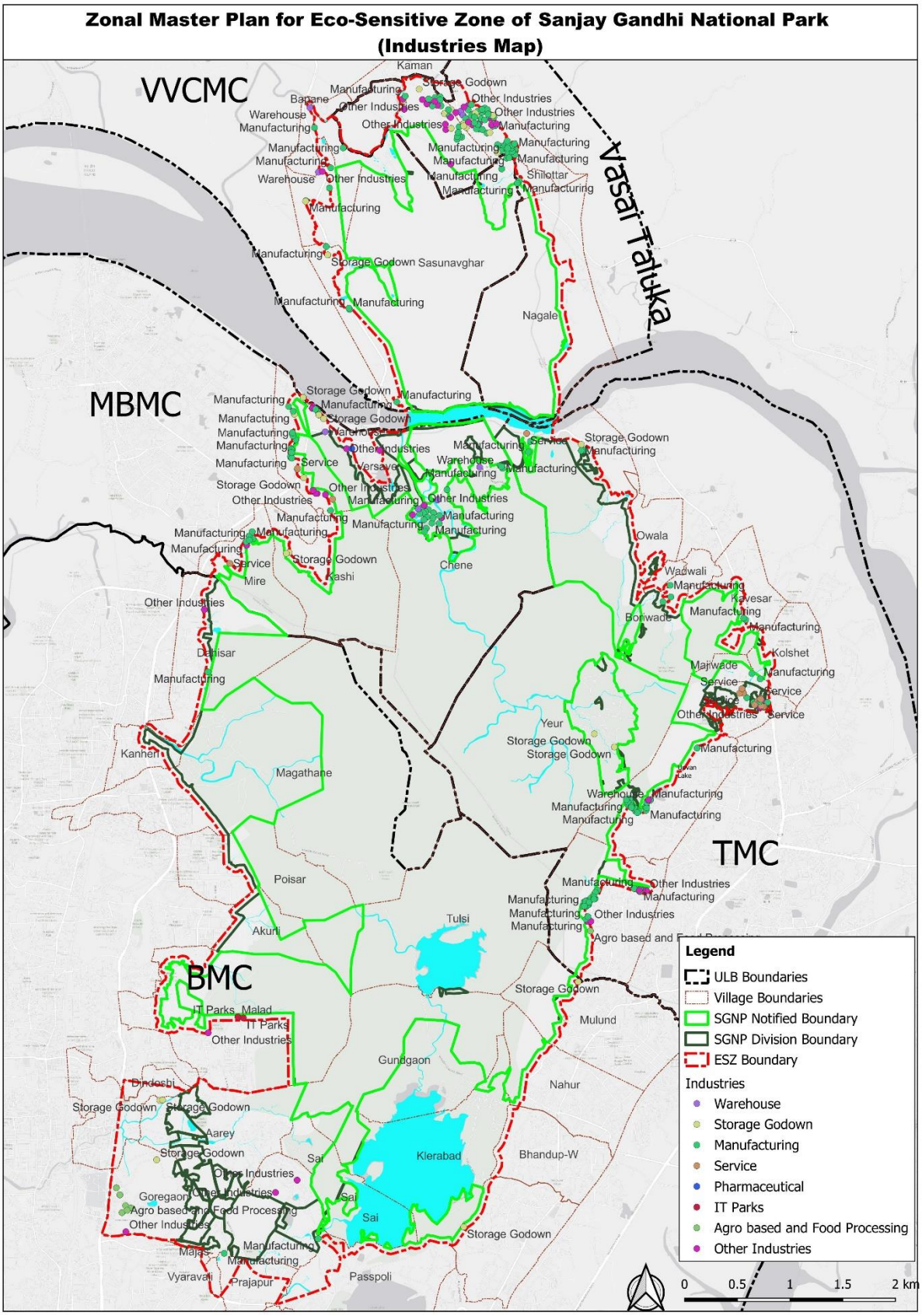
6.3 Conflicts of Activities carried out in ESZ

The ESZ notification lists out activities which are promoted, regulated and prohibited within the ESZ. The analysis of the existing Landuse, development Plan and the ESZ notification resultant in the identification of conflicts which are currently affecting the Eco Sensitive Zones.

6.3.1 Industries within ESZ

Industrial activities, including Ready-Mix Concrete (RMC) plants, have been found to contribute to pollution and environmental degradation within SGNP. These industries release harmful pollutants into the air and water, affecting the overall health of the park’s ecosystem. The following industrial locations have been identified for immediate action under the relevant provision to ensure environmental protection and sustainable conservation of ESZ of SGNP.

Figure 6.2: Industries within ESZ, 2024



Source: Consultant Analysis

Table 6.7: Industrial Activity Conflicts within ESZ, BMC Area, 2024

Sr. No.	Ward	Name of Location	Type of Conflict	Estimated Area (Sq.M)
1	R/North	Konkani Pada, Dahisar East	RMC Plant adjoining the Construction and Debris waste processing Plant of BMC. The Location adjoins the national park	12981.20
2	P/South	Aarey, Jogeshwari East	RMC Plant which is partially within ESZ.	18,479.70
3	P/South	Aarey	Bakery	1,414.81
	K/East	Prajapur		3,748.62

Source: Consultant Analysis

Figure 6.3: Industrial Activity Conflicts within ESZ, BMC Area, 2024

Cement plant at Kokanipada, P North

Cement Plant at Aarey jogeshwari P South

Modern Bakery (Bimbo Bakeries India) at Aarey

Source: Consultant Analysis

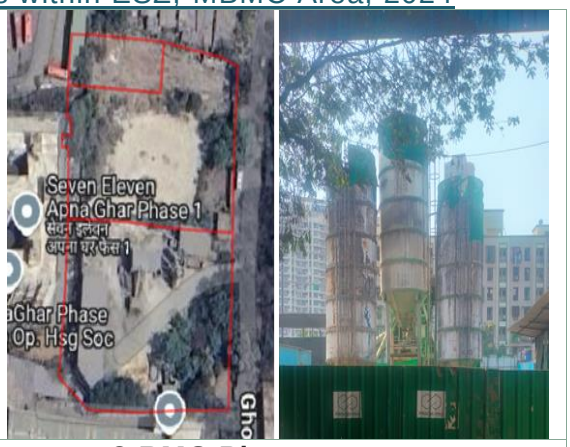
Table 6.8 Industrial Activity Conflicts within ESZ, MBMC Area, 2024

Sr.No	Location	Type of Conflict	Estimated Area (sqm)
1	Ghodbunder	RMC	1857.328
2	Ghodbunder	RMC	1019.357
3	Ghodbunder	RMC	8769.421
4	Chene	J Kumar Casting yark	171815.622
5	Ghodbunder	Construction Materials	5452.075
6	Ghodbunder	Construction Materials	225.621
7	Chene	Construction Materials	31236.659
8	Versave	Construction Materials	173.808
9	Ghodbunder	Anu Industries (paper & ink manufacturing)	3590.272
10	Chene	Cement, Concrete Footpath Interlocking Tile	6389.636
11	Chene	Concrete Pavers Manufacturing	7136.52
12	Versave	Suryadipta Projects Pvt. Ltd. manufacturing boat propeller and agitators	12990.261
13	Versave	Shree Buddheshwar private limited estate	9528.907
14	Versave	Metal Parts Manufacturer	1607.724
15	Kashi	Dyeing Factory	2606.697
16	Mire	Manufacturing construction material	31456.33
17	Kashi	Card Board Factory	1467.224

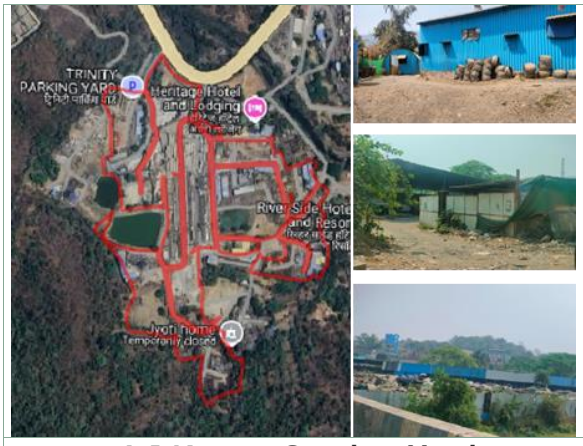
Source: Consultant Analysis

Figure 6.4 Industrial Activity Conflicts within ESZ, MBMC Area, 2024

1 and 2. RMC Plant



3.RMC Plant



4.J Kumar Casting Yard

5.Construction Materials

6.Construction Materials

7.Construction Materials

8. Construction Materials

9. ANU Industries (paper & ink manufacturing)

10.Cement, Concrete Footpath Interlocking Tile

11.Concrete Pavers Manufacturing

12.Suryadipta Projects Pvt. Ltd.

13.Shree Buddheshwar Private Limited Estate

14.Metal Parts Manufacturer

15.Dyeing Factory

16.Manufacturing construction material

17.Card Board Factory

Source: Consultant Analysis

Table 6.9 Industrial Activity Conflicts within ESZ, VVCMC Area, 2024

Sr.No	Location	Type of Conflict	Estimated Area (sqm)
1	Sasunavghar	Petron F Global	856.330
2	Sasunavghar	Ice Factory	1239.361
3	Sasunavghar	Bone and Tallow Industry	5730.820
4	Sasunavghar	RMC Plant	312.598
5	Sasunavghar	Skymix Concrete RMC Plant	1499.210

Source: Consultant Analysis

Figure 6.5 Industrial Activity Conflicts within ESZ, VVCMC Area, 2024

1.Petron F Global

2.Ice Factory

3.Bone and Tallow Industry

4.RMC Plant

5.Skymix Concrete RMC Plant

Source: Consultant Analysis

Table 6.10 Industrial Activity Conflicts within ESZ, Vasai Taluka Area, 2024

Sr. No	Location	Type of Conflict	Estimated Area (Sq.m)
1	Mori	Saree printing industry	3167.111
2	Mori	Saree printing industry	3795.921
3	Mori	Mixcrete India (construction chemicals, coatings, and waterproofing products)	502.277
4	Mori	Shree Powerex (Industrial Brushes)	530.406
5	Mori	Pioneer Power International	743.508
6	Mori	Amar Textiles	2648.035
7	Mori	Saree printing industry	5097.607
8	Mori	VTech Offshore Service Pvt. Ltd.	957.397
9	Mori	Card Board Manufacturing	2354.850
10	Mori	Yess Industry (Polishing Products)	325.046
11	Mori	SS Galvanizers	334.491
12	Mori	Mamta Insulations	392.781
13	Mori	Spaciyo Enterprises Pvt Ltd (Manufacturer of modular furniture)	2441.764
14	Mori	Amrit Prints (Saree Printing)	4397.543
15	Poman	Sarvadnya Udyog Pvt Ltd (Manufacturing of electrical machinery)	2586.438

16	Poman	Pentagon Tapes (manufacturing pressure-sensitive adhesive tapes)	910.440
17	Poman	Apollo Ropes and Alloys pvt ltd (manufacture in high-quality wire ropes)	1625.349
18	Poman	Sky Global Chemicals	377.390
19	Poman	Thermacol manufacturing industry	1101.138
20	Poman	Ikon Lamicoats (PVC Coated Polyster fabric)	1495.748
21	Poman	Mariyam PET Blow	300.206
22	Poman	Heavy metal springs manufacturing	889.242
23	Poman	Rubber industry	210.246
24	Poman	R K Techniques (PVC-Coated Polyester Fabric Manufacturing)	1342.117
25	Poman	Card Board Manufacturing	
26	Poman	Magnet Adhesive Solutions	946.540
27	Poman	Chem Sells	1123.555
28	Poman	UHPC India Pvt Ltd (UHPC dry premix, wet-mix, and precast long-span girders)	613.749
29	Poman	Steelfab Industries	1207.390
30	Poman	Sauradip Chemicals Pvt Ltd	1350.487
31	Poman	Industrial Vessel Manufacturing	583.240
32	Poman	Spaciyo Enterprises Pvt Ltd (Manufacturer of modular furniture)	2441.764
33	Poman	Amrit Prints (Saree Printing)	4397.543
34	Poman	Plywood Factory	767.019
35	Poman	Duo Exam Board Manufacturing	656.554
36	Poman	Alphabet Imaging Technologies Pvt Ltd	1024.826
37	Poman	Industrial Vessel Manufacturing	575.869
38	Poman	V5 Interiors (Wood Based industry)	560.167
39	Poman	Nilkanth Plasto Pack	512.324
40	Poman	Plastic bottle manufacturing industry	542.915
41	Poman	Royal Industries (Extruded Rubber Profiles Manufacturing)	970.172
42	Poman	Mutual Engineering Pvt Ltd (precision tooling and mould manufacturing)	2276.344
43	Poman	Selver Conveyors Pvt Ltd	2642.339
44	Poman	Helli Moulds Pvt Ltd (precision injection mould manufacturing and CNC machining)	1668.298
45	Poman	Hitech Moulds Pvt Ltd (precision injection mould manufacturing)	2003.434
46	Poman	Dhaval Products (Manufactures and supplies various liquid cleaning products)	797.568
47	Poman	Rubber industry	2339.608
48	Poman	Brio industries (brass components and metal forgings)	550.797
49	Poman	Plywood dealer	551.381
50	Poman	Ananta Infrachem LLP (Manufacturer of metals and chemicals)	398.739
51	Poman	Street light manufacturing industry	2418.361
52	Poman	E-Luna (E-Bike Manufacturing)	938.916
53	Poman	Jumbo Quality Metal Prints and Pack	779.000
54	Poman	Krishna Shivam DIgitex	2208.660
55	Poman	M S Petro Chemical	1127.621
56	Shilottar	Petron F Global	345.940

Source: Consultant Analysis

Figure 6.6 Industrial Activity Conflicts within ESZ, Vasai Taluka Area, 2024

1. Saree Printing Industry

2. Saree Printing Industry

3. Mixcrete India (construction chemicals, coatings, and waterproofing products)

4. Shree Powerex (Industrial Brushes)

5. Pioneer Power International

6. Amar Textiles

7. Saree Printing Industry

8. VTech Offshore Service Pvt. Ltd.

9. Card Board Manufacturing

10. Yess Industry Polishing Products

11. SS Galvanizers

12. Mamta Insulations

13. Spaciyo Enterprises Pvt Ltd (Manufacturer of modular furniture)

14. Amrit Prints (Saree Printing)

15. Sarvadnya Udyog Pvt Ltd (Manufacturing of electrical machinery)

16. Pentagon Tapes (manufacturing pressure-sensitive adhesive tapes)

17. Apollo Ropes and Alloys pvt ltd (manufacture in high-quality wire ropes)

18. Sky Global Chemicals

19. Thermacol manufacturing industry

20. Ikon Lamicoats (PVC Coated Polyster fabric)

21. Mariyam PET Blow

22. Heavy metal springs manufacturing

23. Rubber industry

24. R K Techniques (PVC-Coated Polyester Fabric Manufacturing)

25. Card Board Manufacturing

26. Magnet Adhesive Solutions

27. Chem Sells

28. UHPC India Pvt Ltd (UHPC dry premix, wet-mix, and precast long-span girders)

29. Steelfab Industries

30. Sauradip Chemicals Pvt Ltd

31. Industrial Vessel Manufacturing

32. Spaciyo Enterprises Pvt Ltd (Manufacturer of modular furniture)

33. Amrit Prints (Saree Printing)

34. Plywood Factory

35. Duo Exam Board Manufacturing

36. Alphabet Imaging Technologies Pvt Ltd

37. Industrial Vessel Manufacturing

38. V5 Interiors (Wood Based industry)

39. Nilkanth Plasto Pack

40. Plastic bottle manufacturing industry

41. Royal Industries (Extruded Rubber Profiles Manufacturing)

42. Mutual Engineering Pvt Ltd (precision tooling and mould manufacturing)

43. Selvel Conveyors Pvt Ltd

44. Helli Moulds Pvt Ltd (precision injection mould manufacturing and CNC machining)

45. Hitech Moulds Pvt Ltd (precision injection mould manufacturing)

46. Dhaval Products (Manufactures and supplies various liquid cleaning products)

47. Rubber industry

48. Brio industries (brass components and metal forgings)

49. Plywood dealer

50. Ananta Infrachem LLP (Manufacturer of metals and chemicals)

51. Street light manufacturing industry

52. E-Luna (E-Bike Manufacturing)

53. Jumbo Quality Metal Prints and Pack

54. Krishna Shivam DIgitex

55. M S Petro Chemical

56. Petron F Global

Source: Consultant Analysis

Table 6.11 Industrial Activity Conflicts within ESZ, TMC Area, 2024

Sr.No	Location	Type of Conflict	Estimated Area (sqm)
1	Chitalsar manpada	Application Systems	248.77
2	Pachpakhadi	Associated Engineers	992.36
3	Chitalsar manpada	Construction materials	
4	Kavesar	Dalal Engineering Pvt Ltd (stainless steel process equipment)	3511.35
5	Majiwade	Dhiman Rubber Machinery Manufacturer	250.05
6	Pachpakhadi	Elvee Industries	42.37
7	Pachpakhadi	International Industrial Springs	929.83
8	Bhaindar pada	J Kumar Infraprojects Pvt Ltd (Pier and Girders for Metro)	15920.44
9	Pachpakhadi	Lance Auto Parts	1150.33
10	Boriwade	Megha Engineering & Infrastructures Ltd (MEIL)	80274.60
11	Chitalsar manpada	Mikron Teknik Pvt. Ltd	625.04
12	Majiwade	Mukesh Heavy Industries	300.76
13	Majiwade	Laxmi Traders	165.86
14	Chitalsar manpada	Plywood and woodworks	654.97
15	Chitalsar manpada	Plywood and woodworks	474.47
16	Chitalsar manpada	Plywood and woodworks	395.26
17	Chitalsar manpada	Plywood and woodworks	395.51
18	Chitalsar manpada	Ramco Ancillary (Plastic Packaging)	643.55
19	Pachpakhadi	Rao Engineering Pvt. Ltd.	670.33
20	Chitalsar manpada	Revansh foods LLP	212.45
21	Pachpakhadi	Rubicon Research Pvt. ltd.	332.14
22	Majiwade	S. K . Engineering Works	131.73
23	Pachpakhadi	S.S. Enterprises	53.14
24	Majiwade	Dabir Mechanical works	371.08
25	Pachpakhadi	Super Electricals	996.09
26	Chitalsar manpada	Shree Balaji Wood Works	88.39
27	Chitalsar manpada	Gotey Automation	359.33
28	Majiwade	Tathastu Engineering (Fabrications)	135.00
29	Pachpakhadi	Tower Engineering Pvt. Ltd.	1320.06
30	Majiwade	Uni Abex Alloy Products Ltd. (Centrifugal and Static Castings)	18138.49
31	Majiwade	Uni Deritend Limited (Investment casting)	10719.79
32	Chitalsar manpada	Unity Enterprises (Industrial Fabricated items, supplier of electrical switchgear items)	398.69
33	Chitalsar manpada	Furniture Factory	1318.14
34	Majiwade	Vijay Fabricators	147.88
35	Majiwade	Vignahar Engineering Works	270.45

36	Bhaindar pada	Vinayaga Marine Petro Ltd (Maritime and Offshore Infrastructure)	37401.49
37	Majiwade	Mumbai Wood works/ Daya Packers	132.87
38	Pachpakhadi	Kiron Textile Industries	2157.76
39	Majiwade	Ratan Springs	127.41
40	Majiwade	J.S Industries	543.87
41	Majiwade	Enerjet Engineering Services (metal fabrication, machining, and assembly)	229.48
42	Majiwade	Alfatech Engineering Private Limited / UNIVERSAL MEP Projects and Engineering Services Limited	332.61
43	Majiwade	Jeetswara enterprises	286.99
44	Majiwade	Shivanand Machine Tools	172.69
45	Majiwade	Mayfair Machinekraft Pvt. Ltd.	295.45
46	Majiwade	Gemini Tool Engineers	125.23
47	Chitalsar manpada	Navkar Furniture	263.48
48	Chitalsar manpada	Maestrotech Enterprises LLP	289.50
49	Majiwade	Navin Engineers (precision parts, jigs and fixtures	286.99
50	Majiwade	Smita Engineering Works	56.77
51	Chitalsar manpada	Alpha Beltech & Systems	243.22
52	Chitalsar manpada	Eurospin Dry Cleaners Higin Cleaning Systems	212.15
53	Chitalsar manpada	Saw Mill	222.24
54	Majiwade	Megha Pattern Works (Metal and Wooden Pattern)	108.67
56	Majiwade	Reyansh Engineering Works (Metalworking & fabrication)	277.93
57	Pachpakhadi	Metals and Allied products	1119.86
58	Chitalsar manpada	Star Perfumery Works	326.65
59	Pachpakhadi	Electroteknics (Manufacturer of electrical equipment)	679.81
60	Chitalsar manpada	Wood I Land Interiors	676.88
61	Chitalsar manpada	UNITOP Multitech (I) Pvt. Ltd.	277.48

Source: Consultant Analysis

Figure 6.7 Industrial Activity Conflicts within ESZ, TMC Area, 2024

1. **Application Systems**

2. **Associated Engineers**

3. **Construction materials**

4. **Dalal Engineering Pvt Ltd (stainless steel process equipment)**

5. **Dhiman Rubber Machinery Manufacturer**

6. **Elvee Industries**

7. **International Industrial Springs**

8. **J Kumar Infraprojects Pvt Ltd (Pier and Girders for Metro)**

9. **Lance Auto Parts**

10. **Megha Engineering & Infrastructures Ltd (MEIL)**

11. **Mikron Teknik Pvt. Ltd**

12. **Mukesh Heavy Industries**

13. **Laxmi Traders**

14. **Plywood and woodworks**

15. Plywood and woodworks

16. **Plywood and woodworks**

17. **Plywood and woodworks**

18. **Ramco Ancillary (Plastic Packaging)**

19. **Rao Engineering Pvt. Ltd.**

20. **Revansh foods LLP**

21. **Rubicon Research Pvt. ltd.**

22. **S. K . Engineering Works**

23. S.S. Enterprises

24. Dabir Mechanical works

25. **Super Electricals**

26. **Shree Balaji Wood Works**

27. **Gotey Automation**

28. **Tathastu Engineering (Fabrications)**

29. **Tower Engineering Pvt. Ltd.**	30. **Uni Abex Alloy Products Ltd. (Centrifugal and Static Castings)**
31. **Uni Deritend Limited (Investment casting)**	32. **Unity Enterprises (Industrial Fabricated items, supplier of electrical switchgear items)**
33. **Furniture Factory**	34. **Vijay Fabricators**
35. **Vignahar Engineering Works**	**36. Vinayaga Marine Petro Ltd (Maritime and Offshore Infrastructure)**
37. Mumbai Wood works/ Daya Packers	38. **Kiron Textile Industries**
39. Ratan Springs	40. **J.S Industries**

41. Enerjet Engineering Services (metal fabrication, machining, and assembly)

42. **Alfatech Engineering Private Limited / UNIVERSAL MEP Projects and Engineering Services Limited**

43. Jeetswara enterprises

44. **Shivanand Machine Tools**

45. Mayfair Machinekraft Pvt. Ltd.

46. **Gemini Tool Engineers**

47. Navkar Furniture

48. Maestrotech Enterprises LLP

49. Navin Engineers (precision parts, jigs and fixtures

50. Smita Engineering Works

51. Alpha Beltech & Systems

52. Eurospin Dry Cleaners

53. Saw Mill

54. Megha Pattern Works (Metal and Wooden Pattern)

55. Super fibre glass FRP products

56. Reyansh Engineering Works (Metalworking & fabrication)

57. Metals and Allied products

58. Star Perfumery Works

59. Electroteknics (Manufacturer of electrical equipment)

60. Wood I Land Interiors

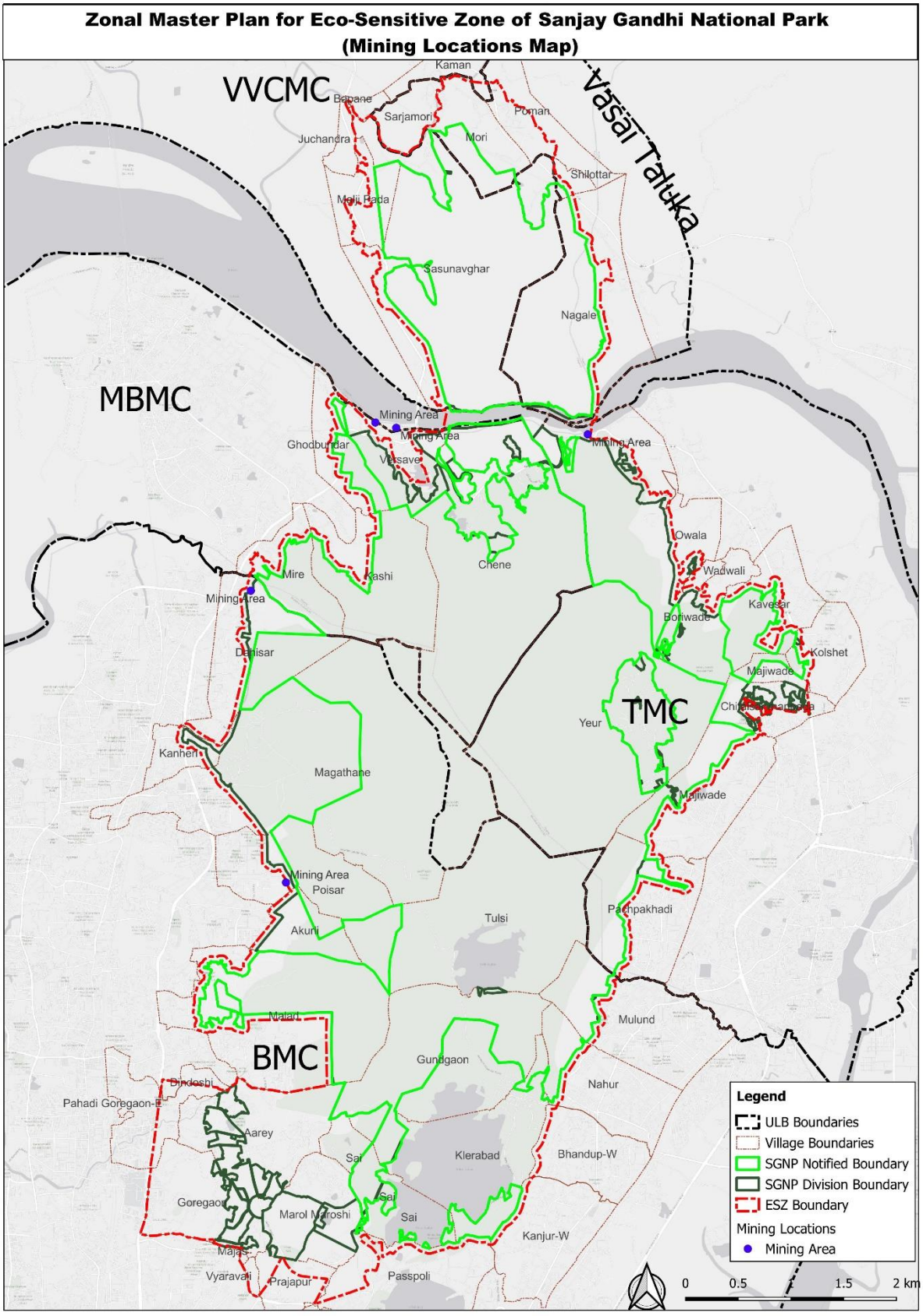
61. UNITOP Multitech (I) Pvt. Ltd.		

Source: Consultant Analysis

6.3.2 Mining Areas

Mining activities in the ESG zone of SGNP pose severe threats to the environment, biodiversity, and natural resources. The extraction of minerals and stone quarrying within the park has led to deforestation, soil erosion, groundwater depletion, and loss of wildlife habitat. Two specific mining sites have been identified where such activities must be immediately prohibited to prevent further degradation of the ESZ and the national park's environment.

Figure 6.8: Mining/Quarrying Area locations within ESZ of SGNP, BMC, 2024



Source: Consultant Analysis

Table 6.12: Mining/Quarrying Activity Conflicts within ESZ, BMC Area, 2024

Sr. No.	Ward	Name of Location	Approximate Area (Sq.M)
1	R/North	Ketki Pada, Dahisar	6,01,975.98
2	R/South	Poisar, Kandivali East	1,54,221.89

Source: Consultant Analysis

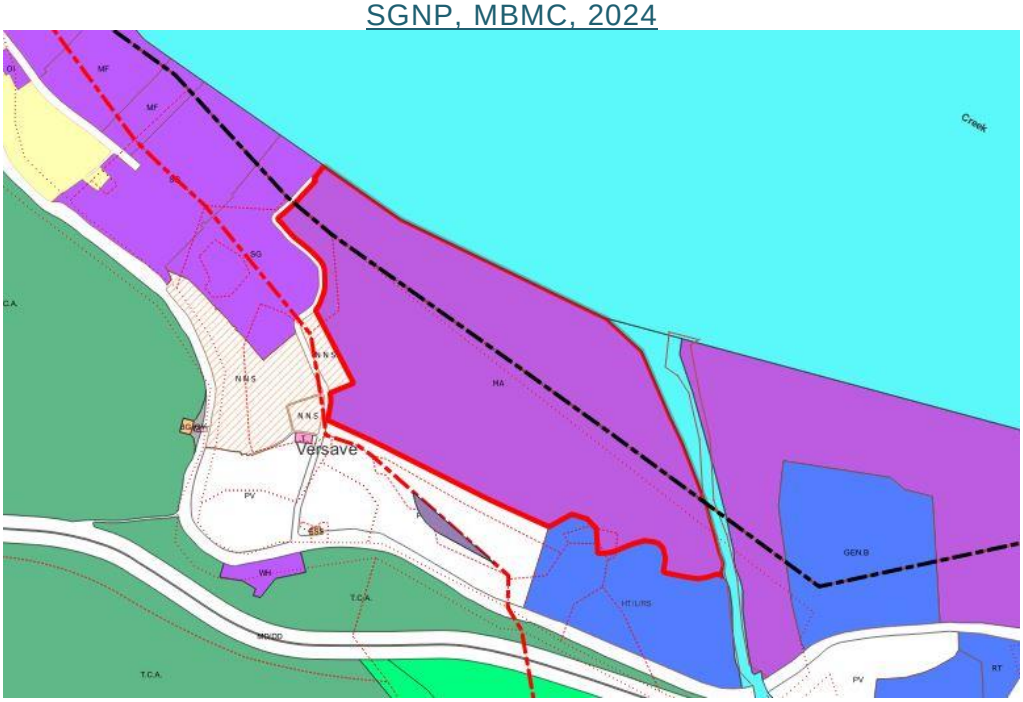
The mining/quarrying sites are not actively being used however the land under the sites is denuded and degraded and needs suitable action for environmental mitigation. These closed mining sites falls on the SGNP Division Forest area.

Figure 6.9: Pictures showing Mining/Quarrying Locations in ESZ of SGNP, BMC, 2024

Ketki Pada, Dahisar, R/North	Poisar, Kandivali East, R/South

Source: Consultant Analysis

Figure 6.10 Pictures showing Mining/Quarrying Locations just outside ESZ of SGNP, MBMC, 2024



Source: Consultant Analysis

This area is denuded of the mangroves previously present and require afforestation efforts to restore back to its original environment in the MBMC area beside Ulhas Creek.

Table 6.13 Mining/Quarrying Activity Conflicts within ESZ, TMC Area, 2024

Sr. No.	Village	Name of Location	Approximate Area (Sq.M)
1	Bhaindar pada	Gaimukh, Along Ghodbunder Road	14,545.98

Source: Consultant Analysis

Figure 6.11 Pictures showing Mining/Quarrying Locations in ESZ of SGNP, TMC, 2024

Gaimukh, Bhaindar pada, Thane

Source: Consultant Analysis

This is a Sand depot in Gaimukh which has led to severe land degradation, air pollution, potential water pollution which needs afforestation techniques to maintain the diversity within the Eco Sensitive Zone.

6.4 Slums & Encroachments in ESZ

It is observed that several slum settlements exist within the ESZ of Sanjay Gandhi National Park (SGNP). These unauthorized settlements have led to deforestation, habitat destruction, and increased environmental impacts including encroachments at times extending into SGNP. The presence of these slums contributes to waste disposal issues, illegal water extraction, and increased human-wildlife conflict, further endangering the biodiversity of SGNP. It is imperative to rehabilitate these settlements on a priority to maintain the ecological balance. As per the ESZ notification, new encroachments and their regularization is prohibited within ESZ.

There are 32 Slum pockets across the ESZ of SGNP in the BMC jurisdiction covering a total area of about 148 Hectares, as below. It has to be noted that there is currently 41.38 Ha of encroachment in the SGNP Division area but there are 9 slums who touches the SGNP Notified boundary as well and are further encroaching in them.

Table 6.14: List of Slums falling within ESZ of SGNP, BMC

Sr. No.	Ward	Name of Slum	Slum Area in ESZ (SqM) (A)	Area in SGNP Division (SqM) (B)	Total Area of Slum within ESZ(SqM) (A+B)	Total Area of Slum including outside ESZ (SqM)
1	R/North	Ketki Pada, Dahisar	36,306.009	160,589.20	196,895.21	234,765.00
2	R/North	Konkani Pada, Dahisar	24,776.915	1,987.30	26,764.22	195,325.00
3	R/Central	Sukarwadi, Kanheri	1543.812	0.00	1,543.81	36652.732
4	R/Central	Kulupwadi, Kanheri	987.58	0.00	987.58	1948.98
5	R/Central	Devi Pade, Magathane	34977.80	2,060.78	37,038.58	97,944.00
6	R/Central	Siddhart Nagar, Magathane	272.226	0.00	272.23	11,754.00
7	R/Central	Janupada, Magathane	752.95	74.47	827.42	827.42
8	R/South	Janupada, Poisar	11,523.26	57,586.14	69,109.40	69,133.00
9	R/South	Damu Nagar, Akurli	16202.90	95,583.80	111,786.70	114445.00
10	R/South	Gautam Nagar, Akurli	2155.02	78907.88	81,062.90	81062.90
11	R/South	Appa Pada, Akurli	3462.98	12,160.69	15,623.67	77,328.00
12	P/North	Appa Pada, Malad East	1,30,300.00	2701.00	133,001.00	393,949.00
13	P/North	Kurar, Malad East	29,567.70	0.00	29,567.70	531,608.00
14	P/North	Triveni Nagar	11,141.70	0.00	11,141.70	16,504.00
15	P/North	Pimpripada, Malad East	121,865.952	2101.00	123,967.95	207,916.00
16	P/North	Aarey	38,894.60	0.00	38,894.60	264,408.00
17	P/South	Aarey	483,085.12	0.00	483,085.12	474,992.86
18	P/South	Marol Maroshi	70,079.56	0.00	70,079.56	70,079.56
19	P/South	SAAI	5470.62	0.00	5,470.62	5470.62
20	K/East	PRAJAPUR	90,828.06	0.00	90,828.06	90,828.06
21	K/East	VYARAVLI	24,669.14	0.00	24,669.14	24,669.14
22	S	Passpoli	109809.00	0.00	109,809.00	109809.00
23	S	Hanuman Nagar, KANJUR-W	14291.08	0.00	14,291.08	113,970.00
24	S	Konkan Nagar, Kanjur West	42,968.20	0.00	42,968.20	252,094.00
25	T	Tenbhipada	35,249.81	0.00	35,249.81	67,972.00
26	S	Tenbhipada	5355.660	0.00	5,355.66	71914.00
27	S	Khindipada	10,677.439	0.00	10,677.44	75,983.00
28	T	Khindipada	32,337.241	0.00	32,337.24	529.00
29	T	Amar Nagar	28,194.714	0.00	28,194.71	33148.37
30	T	Rahul Nagar	7,670.10	16.14	7,686.24	10,216.00
31	T	Hanuman Pada	51,923.632	0.00	51,923.63	106,098.00
32	T	Ghati pada	2859.225	0.00	2,859.23	13,886.00

Source: Consultant Analysis

There are 8 Slum pockets across the ESZ of SGNP in the MBMC jurisdiction covering a total area of about 10.52 Hectares, as below. It has to be noted that there is no encroachment in the SGNP Division area but there are 4 slums who touches the SGNP Notified boundary as well and are having risk of potential encroachments in the park.

Table 6.15: List of Slums falling within ESZ of SGNP, MBMC

Sr. No.	Village	Name of Slum	Area in ESZ (SqM) (A)	Area in SGNP Division (SqM) (B)	Total Area of Slum within ESZ(SqM) (A+B)	Total Area of Slum including outside ESZ (SqM)
1	Ghodbunder	Dachkul Pada	31217.30	0.00	31217.30	132106.51
2	Ghodbunder	Kashimira	2170.54	0.00	2170.54	2170.55
3	Versave	Jaihind Nagar	9240.24	0.00	9240.24	13087.06
4	Mire	Mahajan Wadi	16240.76	0.00	16240.76	46,413.76
5	Kashi	Mandvipada	17441.28	0.00	17441.28	17441.28
6	Kashi	Mashachapada	22868.60	0.00	22868.60	22508.91
7	Mire	MIDC Mira Road East	1092.92	0.00	1092.92	1092.93
8	Versave	Retibunder	11639.90	0.00	11639.90	13918.31

Source: Consultant Analysis

There are 13 Slum pockets across the ESZ of SGNP in the TMC jurisdiction covering a total area of about 26.09 Hectares, as below. It has to be noted that there is currently 1.33 Ha of encroachment in the SGNP Division area but there are 10 slums who touches the SGNP Notified boundary as well and are further encroaching in them.

Table 6.16 List of Slums falling within ESZ of SGNP, TMC

Sr. No.	Village	Name of Slum	Area in ESZ (SqM) (A)	Area in SGNP Division (SqM) (B)	Total Area of Slum within ESZ(SqM) (A+B)	Total Area of Slum including outside ESZ (SqM)
1	Pachpakhadi	Shree Nagar	19,429.71	829.823	20259.533	39,611.643
2	Pachpakhadi	Kailash Nagar	2715.48	6.75	2722.23	2715.48
3	Pachpakhadi	Juna Gaon	7767.35	0.00	7767.35	7767.35
4	Pachpakhadi	Hanuman Nagar	72161.54	498.03	72659.57	300750.56
5	Pachpakhadi	Ramnagar	25611.40	3.03	25614.43	25638.40
6	Pachpakhadi	Karvalo Nagar	29984.60	60.41	30045.01	82030.34
7	Pachpakhadi	Gangadhar Nagar	4043.46	0.00	4043.46	4043.46
8	Kolshet	Patlipada	7472.88	0.00	7472.88	220275.45
9	Chitalsar manpada	Krishna Nagar Manpada	16395.94	2792.09	19188.03	12527.70

10	Majiwade	Lokmanya Nagar	49955.85	1286.69	51242.54	293837.64
11	Pachpakhadi	Lokmanya Nagar	6716.59	0.00	6716.59	
12	Majiwade	Konkanipada	17306.47	0.00	17306.47	26255.26
13	Chitalsar Manpada	Konkanipada	1130.13	7,818.66	8948.79	

Source: Consultant Analysis

Many of these slums share their boundaries with SGNP Notified Boundary as well. These slums increase the pressure of encroachments within the boundary of SGNP. Slums are also location within the cautious zone of Human Animal Conflict. Their Rehabilitation needs to be a Priority.

AMIT KUMAR RAJHANS

Digitally signed by AMIT KUMAR RAJHANS
DN: cn=AMIT KUMAR RAJHANS c=IN l=Mumbai o=Tandon Urban Solutions Private Limited ou= Consulting Engineer Service e=tandonandassociates@gmail.com
Date: 2025-09-08 11:45+05:30

ANOOP HEMANT APTE

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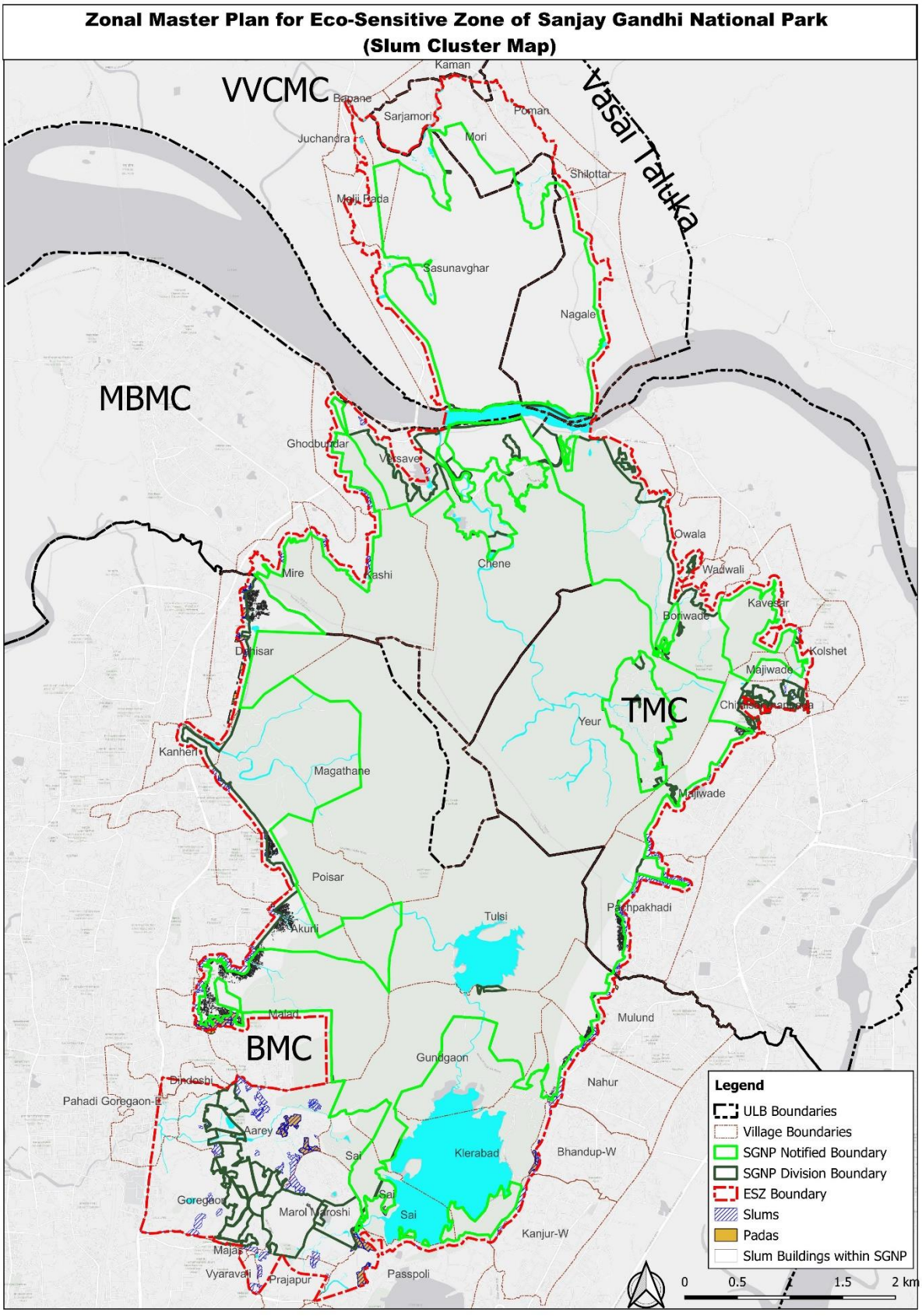
Figure 6.12: Slum/Encroachment within ESZ of SGNP, BMC 2024



Source: Consultant Analysis

6.5 Human Animal Conflict

Human-Animal conflict refers to the clashes between humans and wildlife, often resulting from habitat loss, urban expansion, and resource competition. As human population grows and encroach upon natural habitats, animals like leopards, monkeys, snakes are forced into closer contact with people, leading to attacks, property damage, and retaliatory killings. These conflicts pose serious threats to both human safety and wildlife conservation.

6.5.1 Human Animal Conflict

The issue of Human-Animal conflicts within the BMC (Brihanmumbai Municipal Corporation) area, specifically involving leopards, has become a critical concern. A total of 22 conflict points has been identified, based on Forest department records, where these encounters have occurred, each representing a significant risk to human safety and wildlife preservation. These incidents have had devastating consequences, with a total of 17 fatalities resulting from leopard attacks. Additionally, 5 other incidents have led to injuries, further highlighting the serious implications of these conflicts for the local population.

Human-animal conflicts within the Mira-Bhayandar Municipal Corporation (MBMC) area—particularly involving leopards, panthers, and monkeys—have emerged as a major concern. According to records from the Forest Department, 26 conflict hotspots have been identified: 26 involving leopards. Each of these locations poses a significant threat to both public safety and wildlife conservation. These encounters have led to serious consequences, including injuries and even fatalities, underscoring the urgent need to address the risks these conflicts present to the local community.

In TMC (Thane Municipal Corporation) area, specially involving leopards, crocodile and monkeys has been a critical concern. A total of 19 (17 Leopards and 2 Crocodile) has been identified, based on Forest department records, where these encounters have occurred, each representing a significant risk to human safety and wildlife preservation. These incidents have had devastating consequences, with a fatalities risk to injuries, further highlighting the serious implications of these conflicts for the local population. However, Monkeys are present all over the ESZ area.

6.5.2 Trends and Patterns

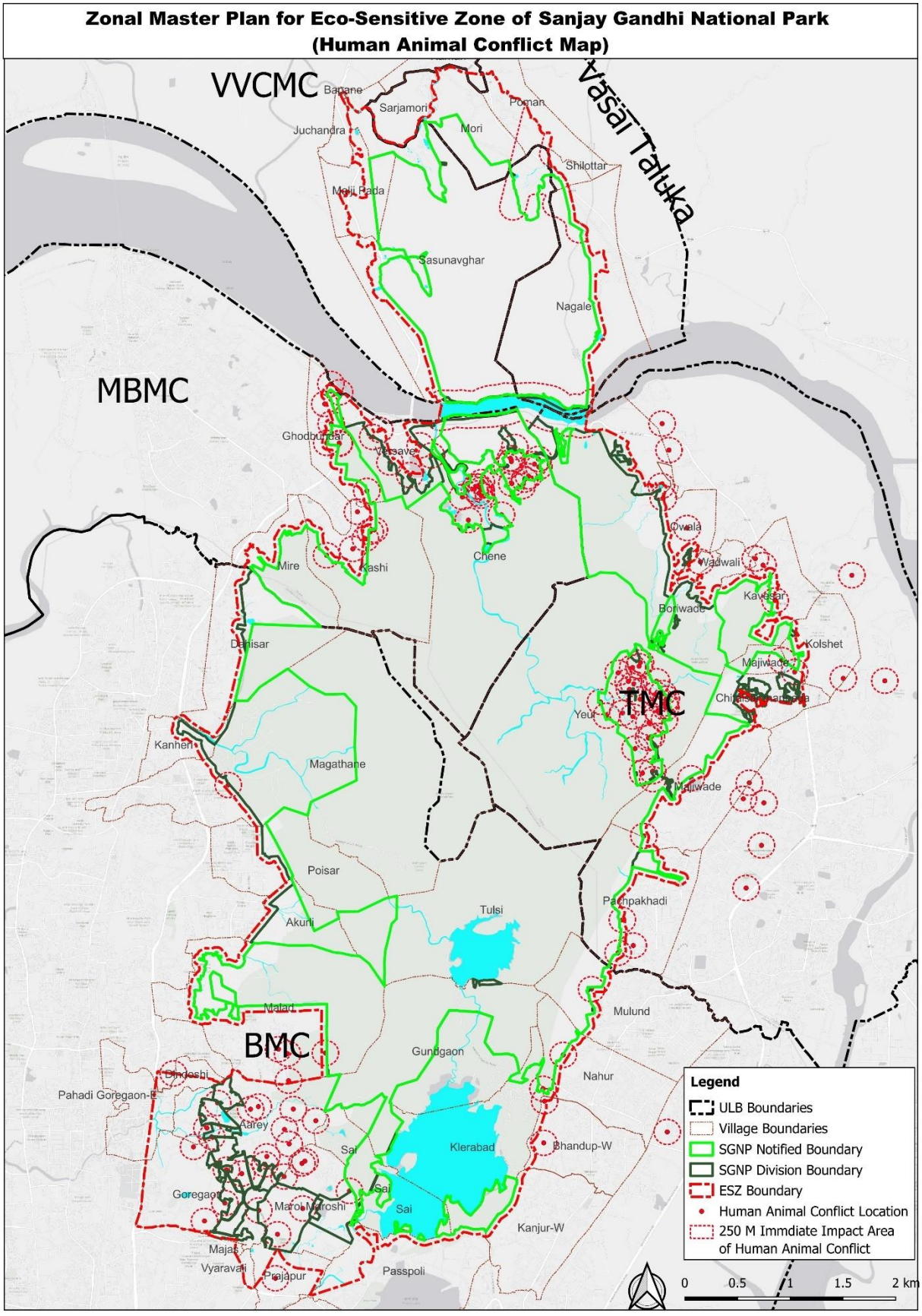
Analysis of these incidents suggests a concerning trend. The frequency of leopard attacks has increased over the past decade, with the highest number of conflicts occurring in areas adjacent to forested zones such as Aarey Colony, Sanjay Gandhi National Park (SGNP), and other green corridors. The pattern of these attacks indicates that the leopard's natural habitat is increasingly encroaching upon human settlements, leading to more frequent encounters

Analysis of these incidents suggests a concerning trend. The frequency of leopard attacks has increased over the past decade, with the highest number of conflicts occurring in areas within Eco Sensitive Zone such as Chene, Sanjay Gandhi National Park (SGNP), and other green corridors. The pattern of these attacks indicates that the leopard's natural habitat is increasingly encroaching upon by the human settlements, leading to more frequent encounters.

Several factors have contributed to this escalating crisis:

- Urban Expansion: Rapid urbanization has led to deforestation, reducing the natural habitat available for leopards and pushing their habitat due to human interventions
- Food as Easy Prey: Depletion of natural prey due to habitat destruction has forced leopards to seek alternative food sources, sometimes leading them into villages and urban areas in search of easy prey as food.
- Human Activities: Increased human movement into forested zones for activities such as illegal construction, garbage dumping, and deforestation has heightened the likelihood of encounters.
- Leopard Adaptability: Leopards are highly adaptable and have learned to survive in semi-urban environments, increasing the probability of conflict.

Figure 6.13: Human Animal Conflict in or near ESZ of SGNP



Source: Consultant Analysis

6.5.3 Identified Conflict Zones

The 20 conflict points identified within the BMC area are primarily concentrated in the following locations:

- Aarey Colony
- Sanjay Gandhi National Park (SGNP) perimeter
- Film City, Goregaon
- Powai and Vikhroli forest fringes

The 29 conflict points identified within the MBMC area are primarily concentrated in the following locations:

- Chene area
- Versave area
- Kashi area
- Ghodbunder Road (connecting SGNP to Vasai-Virar green zones)

The 23 conflict points identified within the TMC area are primarily concentrated in the following locations:

- Yeoor
- Panchpakhadi

6.6 Vulnerability analysis using MCDM

Vulnerability analysis plays a critical role in environmental management, particularly in the conservation of ecologically sensitive zones such as the SGNP Eco-sensitive Zone. As urbanization, climate change, and human activities continue to put pressure on these fragile ecosystems, it is vital to assess and identify areas that are most vulnerable. Vulnerability analysis enables decision-makers to prioritize conservation efforts, allocate resources efficiently, and develop strategies to protect biodiversity and ecosystem services. Without a clear understanding of the vulnerability of different areas, conservation efforts could be ineffective or misdirected, leaving critical ecosystems at risk. By performing a vulnerability analysis, areas under threat due to habitat loss, pollution, overexploitation, or human encroachment can be identified, allowing for targeted interventions that can help mitigate these risks and preserve the integrity of the ecosystem.

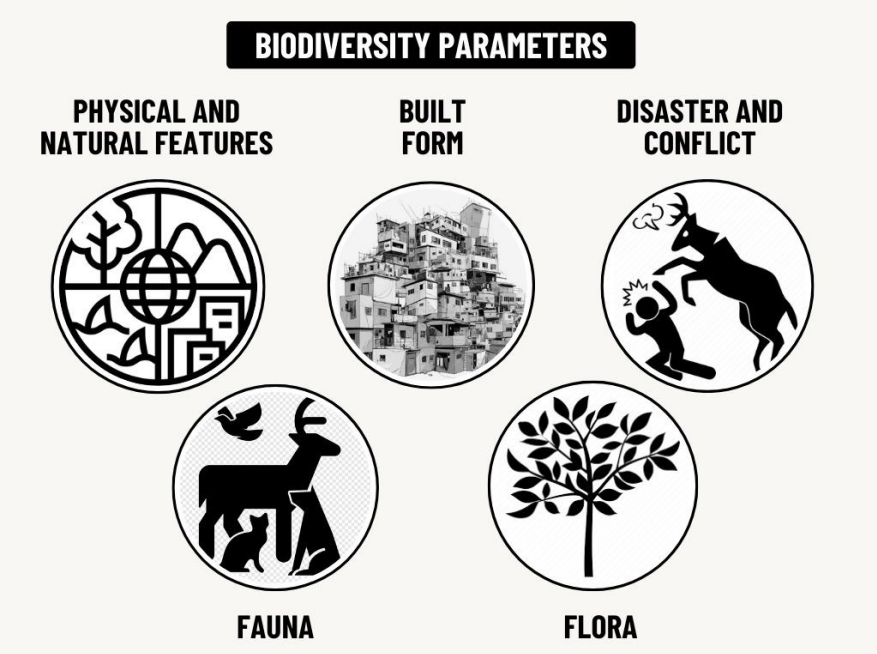
To assess the vulnerability of lands within the SGNP Eco-sensitive Zone, a Multi-Criteria Decision Making (MCDM) approach is employed. MCDM is a decision-making framework that allows the evaluation of multiple criteria, which may be conflicting, to arrive at an optimal solution. In the context of environmental management, this method is particularly useful as it enables the integration of various environmental, ecological, and socio-economic factors into a single, coherent decision-making process. These factors include habitat quality, human population density, proximity to urban areas, and more. MCDM helps to structure and quantify complex problems, making it easier to compare the vulnerability of different regions based on their unique characteristics.

Among various MCDM techniques, the Analytic Hierarchy Process (AHP) is selected to evaluate the vulnerability of lands in the SGNP Eco-sensitive Zone. AHP is a structured method that breaks down complex decision-making problems into a hierarchy of criteria and sub-criteria. It allows experts to conduct pairwise comparisons to determine the relative importance of each criterion, making it possible to quantify subjective judgments and prioritize the factors that most significantly contribute to vulnerability.

The AHP process begins by identifying and defining the criteria that affect vulnerability, such as habitat quality and human impact. These criteria are then structured into a hierarchical framework. The next step involves performing pairwise comparisons to assess the relative importance of each criterion. This is typically done by assigning numerical values to indicate how much more important one criterion is compared to another. Once the pairwise comparisons are completed, the results are used to calculate the weight of each criterion. These weights reflect the relative importance of each factor in contributing to vulnerability. After determining the weights, each area in the SGNP Eco-sensitive Zone is evaluated against the established criteria. The areas are scored based on how well they align with each criterion, and these scores are then combined according to the criteria weights to produce an overall vulnerability score for each area.

6.7 Criteria Selected for MCDM

A comprehensive approach is needed to capture the complex interplay of environmental, ecological, developmental and socio-economic factors. The goal is to identify the most significant contributors to land vulnerability, encompassing both natural and anthropogenic influences. After thorough consideration, five main criteria were selected



i. Natural and Physical Features: The Natural and Physical Features criterion was deemed essential as these aspects, including terrain, soil properties, water bodies, and tree cover, directly impact ecosystem stability, water

retention, erosion susceptibility, and biodiversity. These features are foundational for maintaining ecological balance, making them crucial to assess land vulnerability.

ii. Built Form: The Built Form criterion was also prioritized, given the significant human influence around SGNP, where urbanization and infrastructure development contribute to habitat fragmentation and increased pressure on the environment

iii. Disasters & Conflicts: Disasters & Conflicts emerged as another critical factor, as natural disasters such as floods, combined with human-wildlife conflicts, can severely disrupt ecosystems and accelerate land degradation

iv. Fauna: The Fauna and Flora criteria were identified as vital indicators of overall ecosystem health, as the well-being of animal and plant populations directly reflects the resilience and stability of the environment.

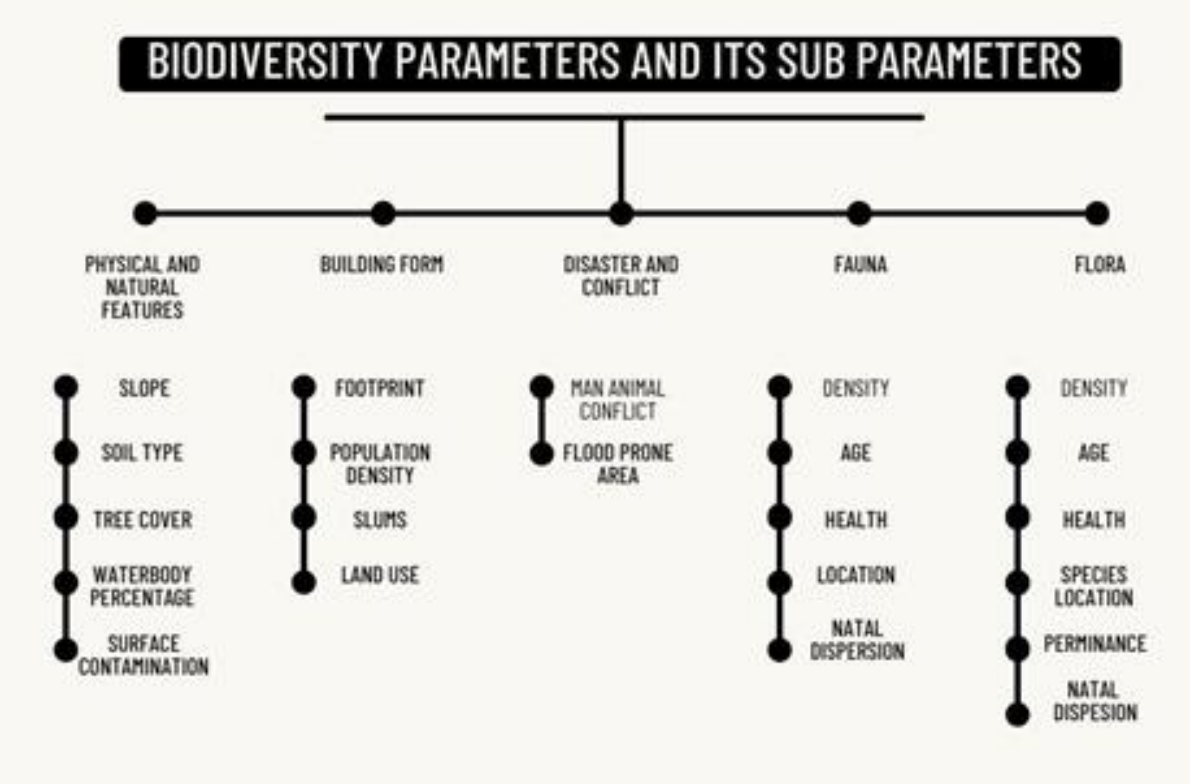
v. Flora: Flora supports the ecosystem by providing essential services like soil stabilization, while fauna is integral for biodiversity and ecosystem functions.

By combining these key areas, the analysis provides a more holistic understanding of the factors contributing to land vulnerability, guiding the development of targeted and effective conservation strategies.

6.8 Sub Criteria Structuring and Scoring

Once the criteria are identified, the next step involves structuring the sub-criteria into a hierarchical framework at subsequent levels. Each land area within the SGNP Eco-sensitive Zone is then assessed against these criteria to determine its vulnerability. To conduct a detailed vulnerability assessment, a grid-based approach has been employed, dividing the study area into 100m × 100m grids. This micro-level framework enables a fine-grained analysis of ecological stressors, habitat quality, and land-use changes. Each grid functions as an individual unit, allowing for a comprehensive evaluation of environmental variables, ensuring a precise and systematic understanding of the study area's ecological conditions. In case of parameters of Biodiversity – Flora and fauna, the survey grid is larger, as per the area characteristics and the data captured has been transferred to the smaller grids as adopted for the MCDM analysis.

Since each criterion will be measured on a different scale, it becomes necessary to normalize the data to ensure that all variables can be compared on the same scale. This normalization process converts the diverse data points into a common scale, ranging from 1 to 5, 5 represents the least vulnerable, indicating the most environmentally rich areas and 1 represents developed zone or areas which have lower environmental values. By standardizing the data in this manner, the analysis allows for a consistent and meaningful comparison of the land's ecological health and vulnerability.



The following section outlines the sub-criteria and their respective normalized score factors used in this analysis.

6.8.1 Physical & Natural Features

6.8.1.1 Slope

The slope of an area plays a crucial role in determining environmental vulnerability and richness. Steep slopes are more prone to erosion and landslides, making them less stable for vegetation and human settlements. They also influence water drainage patterns, affecting soil moisture and groundwater recharge. Gentle slopes, on the other hand, support better soil retention and plant growth, contributing to ecological richness. In areas with steep terrain, afforestation and erosion control measures are essential to maintain environmental stability.

Slope was calculated using Digital Terrain Model which was then categorized into 5 class for easy of classification according to the scale

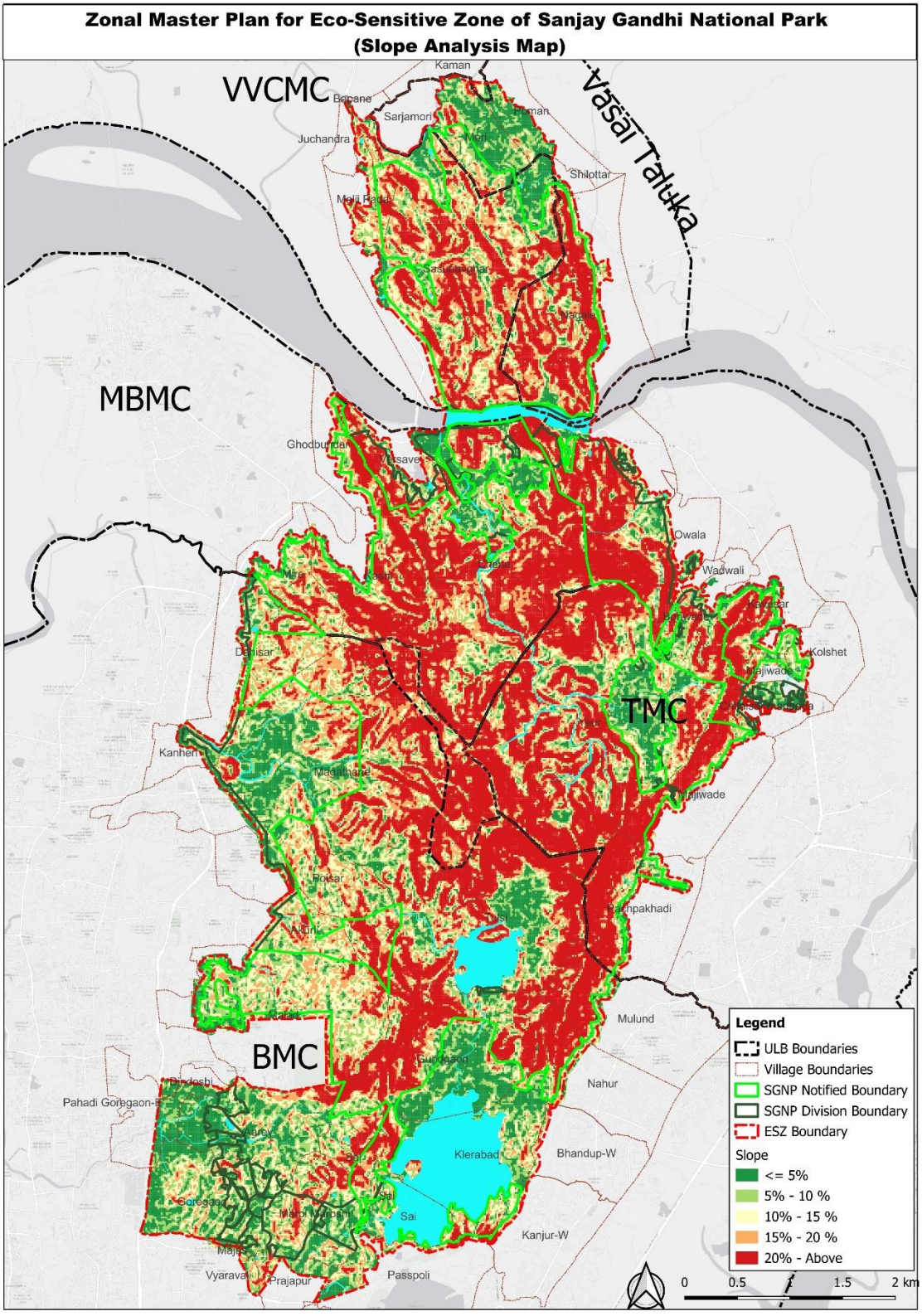
Slope	0-5 %	5-10 %	10-15 %	15-20 %	More than 20 %
Scoring	5	4	3	2	1

Source: Consultant Analysis

The scoring system reflects the suitability of land for development, agriculture, and accessibility. 0-5% slopes receive the highest score (5) as they are easiest to use with minimal erosion risk. 5-10% slopes (4) remain manageable but may require slight modifications. 10-15% slopes (3) pose moderate challenges, impacting construction and drainage. 15-20% slopes (2) have increased erosion risks and require engineering solutions. Slopes above 20% score lowest (1) due to significant stability

concerns, limited usability, and high development costs. This system ensures an objective assessment of land feasibility based on slope constraints.

Figure 6.14 Slope Map for ESZ of SGNP



Source: Consultant Analysis

6.8.1.2 Soil type

Soil type determines land fertility, water-holding capacity, and vegetation support. Sandy soils drain quickly but may lead to desertification, while clayey soils retain water but can cause waterlogging. Loamy soils, rich in organic matter, are the most suitable for plant growth and biodiversity. Soil type also influences erosion rates, agricultural productivity, and the ability to support diverse ecosystems. Understanding soil composition helps in land management strategies and conservation planning.

The soil map was sourced from the Geological Survey of India, and the soils within the eco-sensitive area were ranked based on their environmental contributions.

Soil Type	Quaternary Alluvium, Hydrosol, Eutric Nitosols	Laterite and Oxisol	Bed Rock Soil, Bog Aggregate, and Agglomerate Tuff	Calc Tuffa, Trachyte, and Cretaceous Soil	Gabbro, Basalt Flow
Scoring	5	4	3	2	1

Source: Consultant Analysis

Quaternary Alluvium, Hydrosol, and Eutric Nitosols score 5 due to their high fertility, water retention, and support for diverse ecosystems, including wetlands and sustainable agriculture. Laterite and Oxisol, scoring 4, are vital for biodiversity, especially in tropical regions, but are prone to degradation if mismanaged. Bed Rock Soil, Bog Aggregate, and Agglomerate Tuff receive a score of 3 as they provide geological stability and support some vegetation, though their ecological benefits are moderate. Calc Tuffa, Trachyte, and Cretaceous Soil, scoring 2, have limited fertility and contribute less to ecosystem support. Lastly, Gabbro and Basalt Flow, with a score of 1, are the least beneficial as they primarily consist of hard, igneous rock with minimal vegetation support and low ecological sensitivity. This scoring ensures that soils are ranked according to their ability to sustain life, regulate water, and support biodiversity.

6.8.1.3 Tree Cover

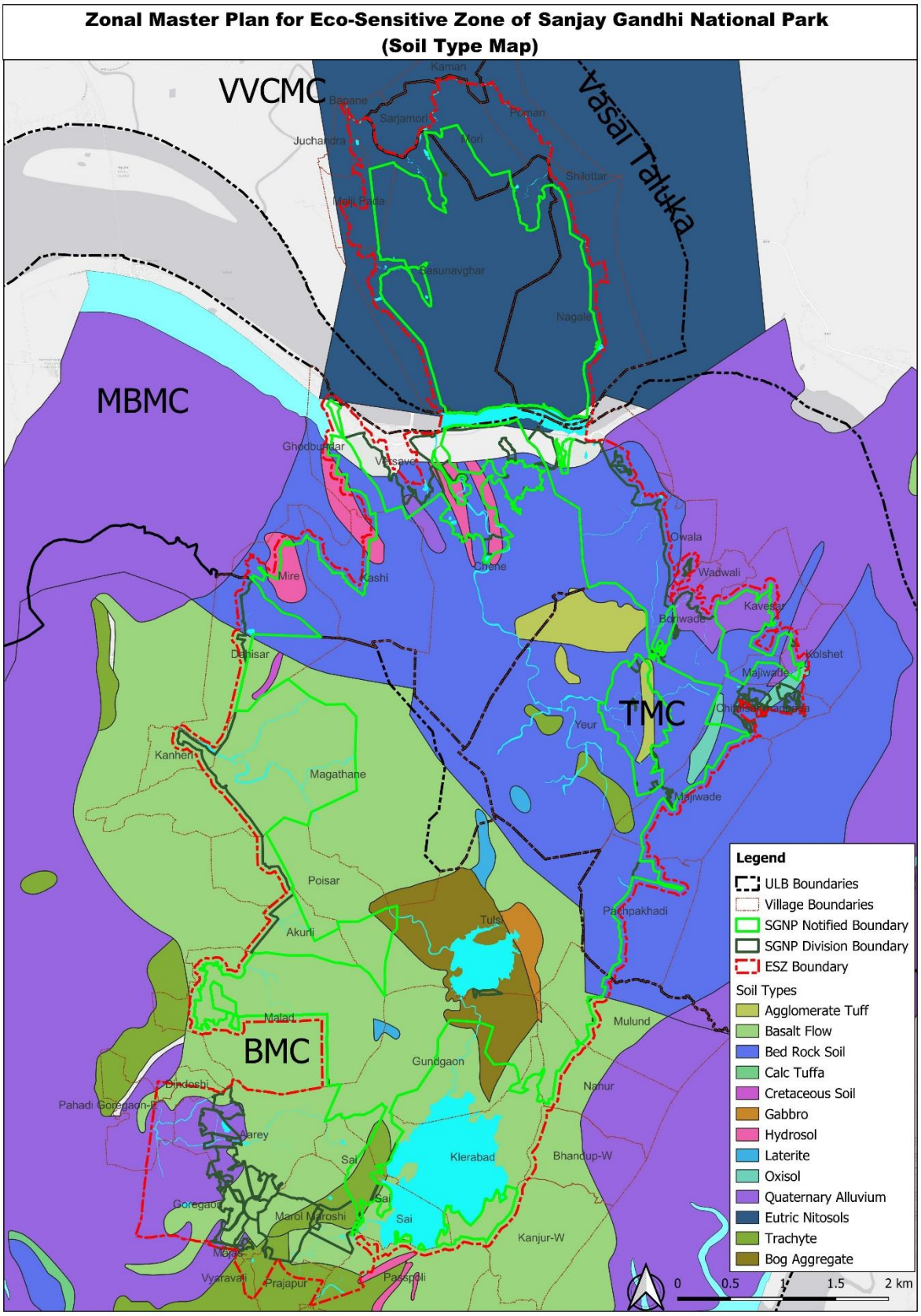
Tree cover is a primary indicator of environmental richness, as it supports biodiversity, prevents soil erosion, and regulates climate. Areas with dense tree cover act as carbon sinks, absorbing greenhouse gases and providing habitat for wildlife. Deforestation leads to habitat loss, increased temperatures, and reduced soil fertility. Maintaining tree cover is crucial for ecological balance, preventing desertification, and ensuring sustainable land use.

Tree Cover Percentage	0-20%	20-40%	40-60%	60-80%	Above 80%
Scoring	1	2	3	4	5

Source: Consultant Analysis

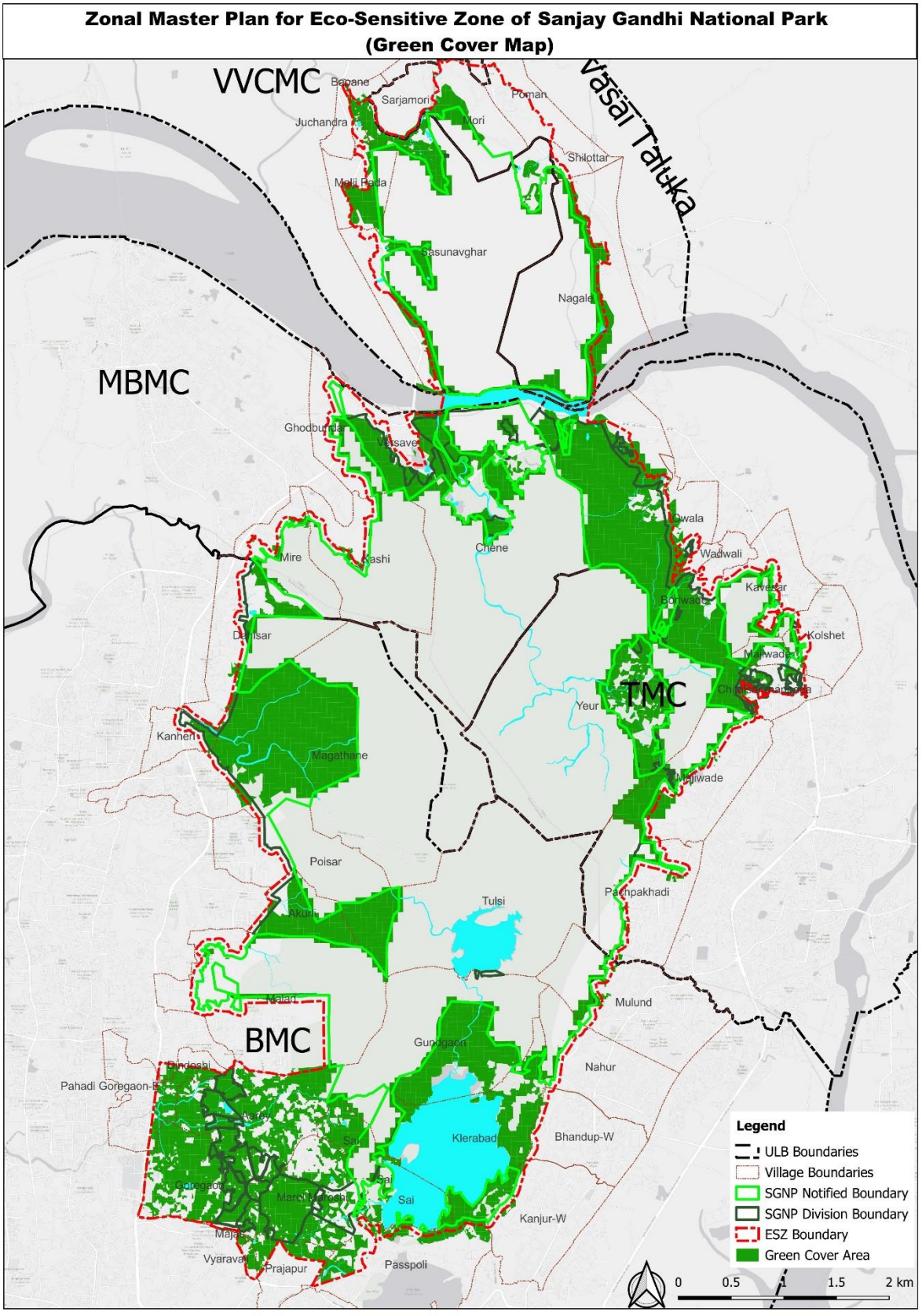
The scoring was based on the percentage of green cover, which was identified and analysed using drone imagery. A higher percentage of green cover indicated greater environmental benefits.

Figure 6.15 Soil Type Map of ESZ of SGNP



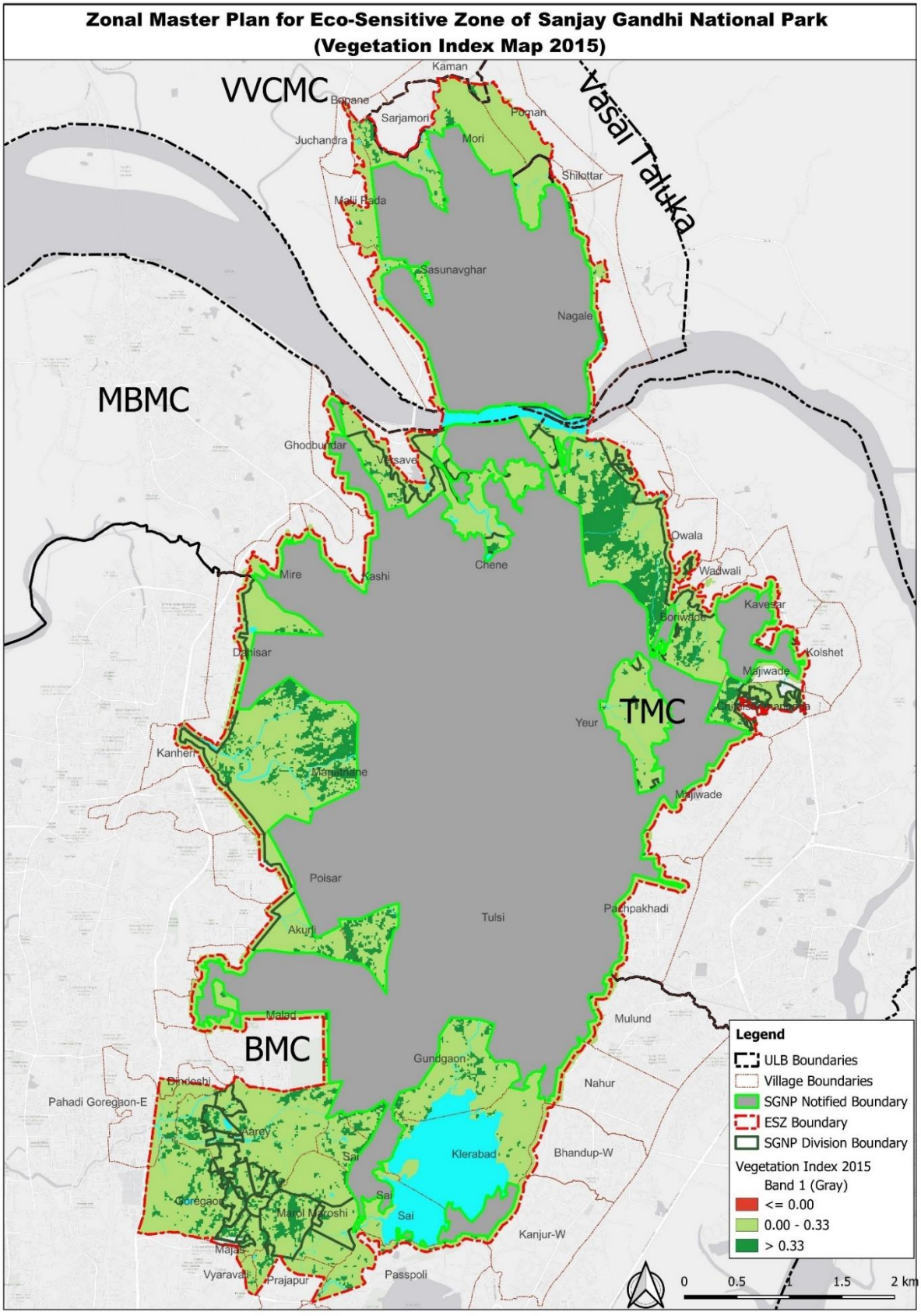
Source: Geological Survey of India

Figure 6.16 Tree Cover Map in ESZ



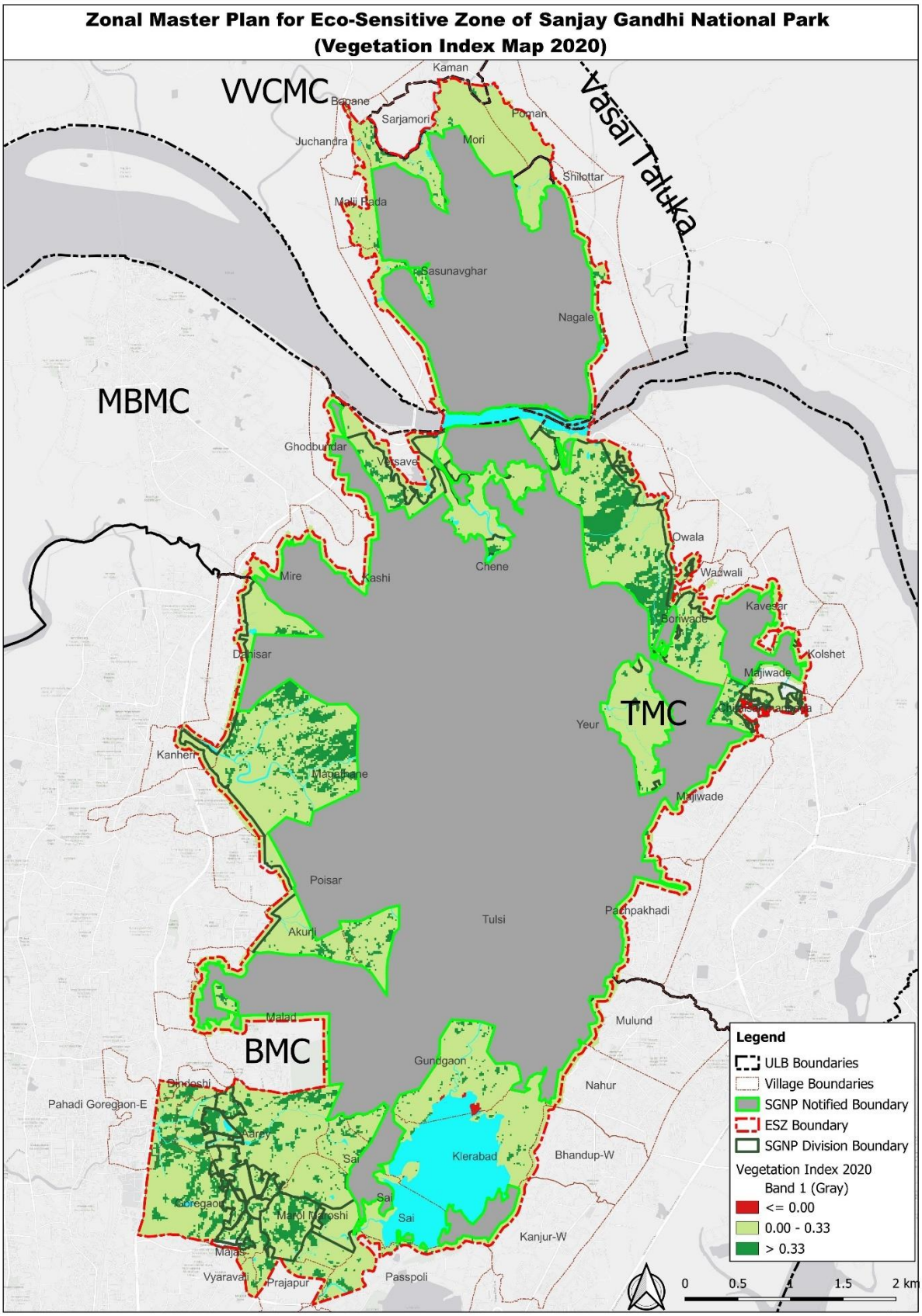
Source: Consultant Analysis

Figure 6.17 Vegetation Index 2015



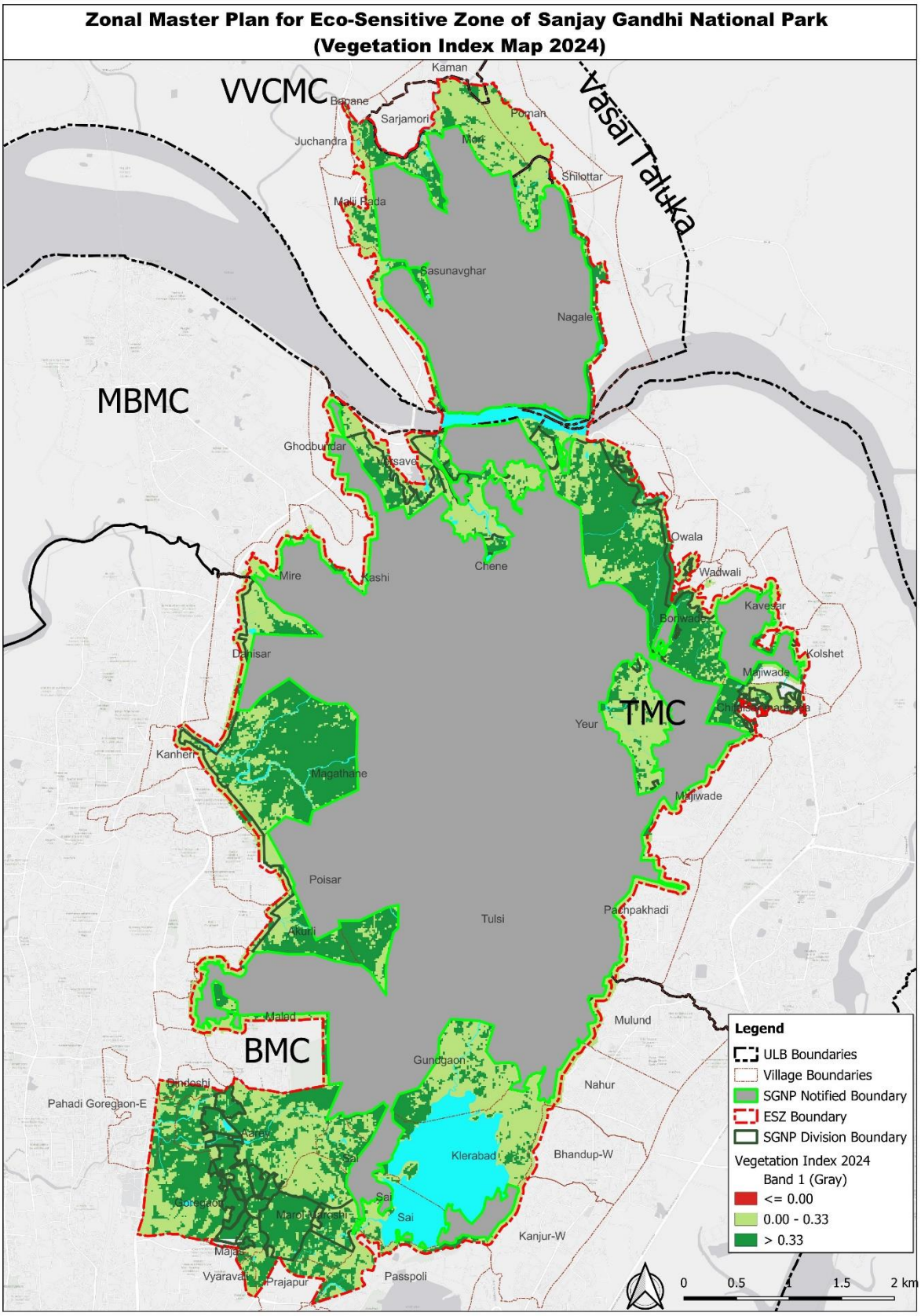
Source: Consultant Analysis

Figure 6.18 Vegetation Index 2020



Source: Consultant Analysis

Figure 6.19 Vegetation Index 2024



Source: Consultant Analysis

6.8.1.4 Water Body Presence

The presence of water bodies such as lakes, rivers, and wetlands enhance biodiversity and provides essential resources for flora and fauna. These areas act as natural cooling systems, regulate local climate, and support aquatic ecosystems. Protecting water resources ensures ecological stability and long-term environmental sustainability.

Water Body Percentage	0-20%	20-40%	40-60%	60-80%	Above 80%
Scoring	1	2	3	4	5

Source: Consultant Analysis

The scoring was determined by the percentage of water bodies present, identified and analysed through drone imagery. A higher water body percentage signified a more ecologically rich area.

6.8.1.5 Surface Contamination

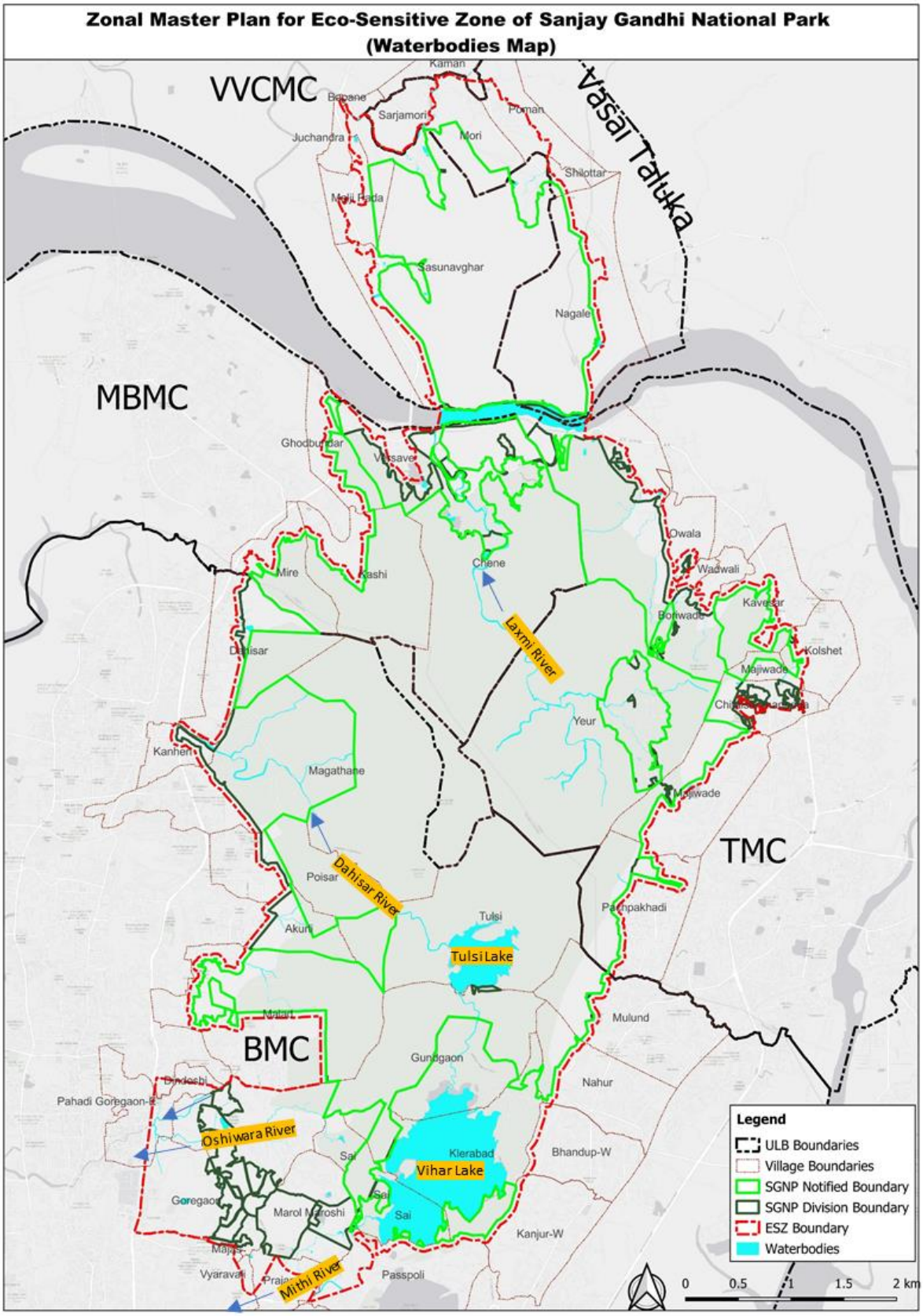
Surface contamination, including pollutants such as chemicals, heavy metals, and industrial waste, degrades soil and water quality. Contaminated land affects plant growth, harms wildlife, and poses health risks to humans are critical to understand the surface degradation and preventing further environmental degradation.

Number of Surface Contamination Points	0	1	2	3	4 or more
Score	5	4	3	2	1

Source: Consultant Analysis

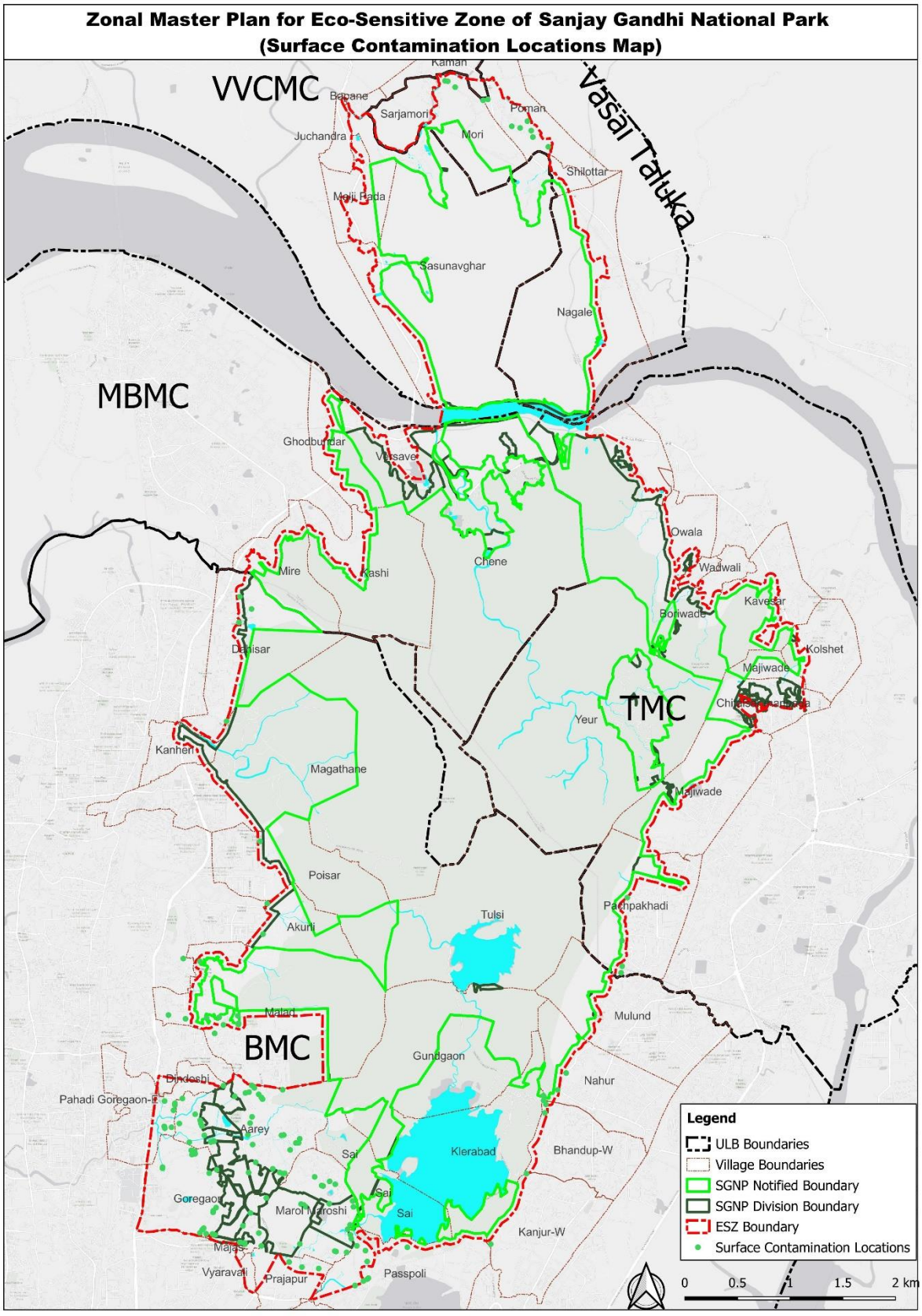
Surface Contamination points were identified by primary survey. Surveyor's team identified the points where there was Garbage dumping, Discoloration of soil, Oil or chemical spillage, Presence of dead fauna, Unnatural soil texture (sticky, greasy, powdery, Corroded pipelines or storage tanks etc. The grids were scored as per number and extent of the contamination.

Figure 6.20 Waterbodies Map of ESZ of SGNP



Source: Consultant Analysis

Figure 6.21 Surface Contamination map of ESZ of SGNP



Source: Consultant Analysis

6.8.2 Built Form

6.8.2.1 Building Footprints

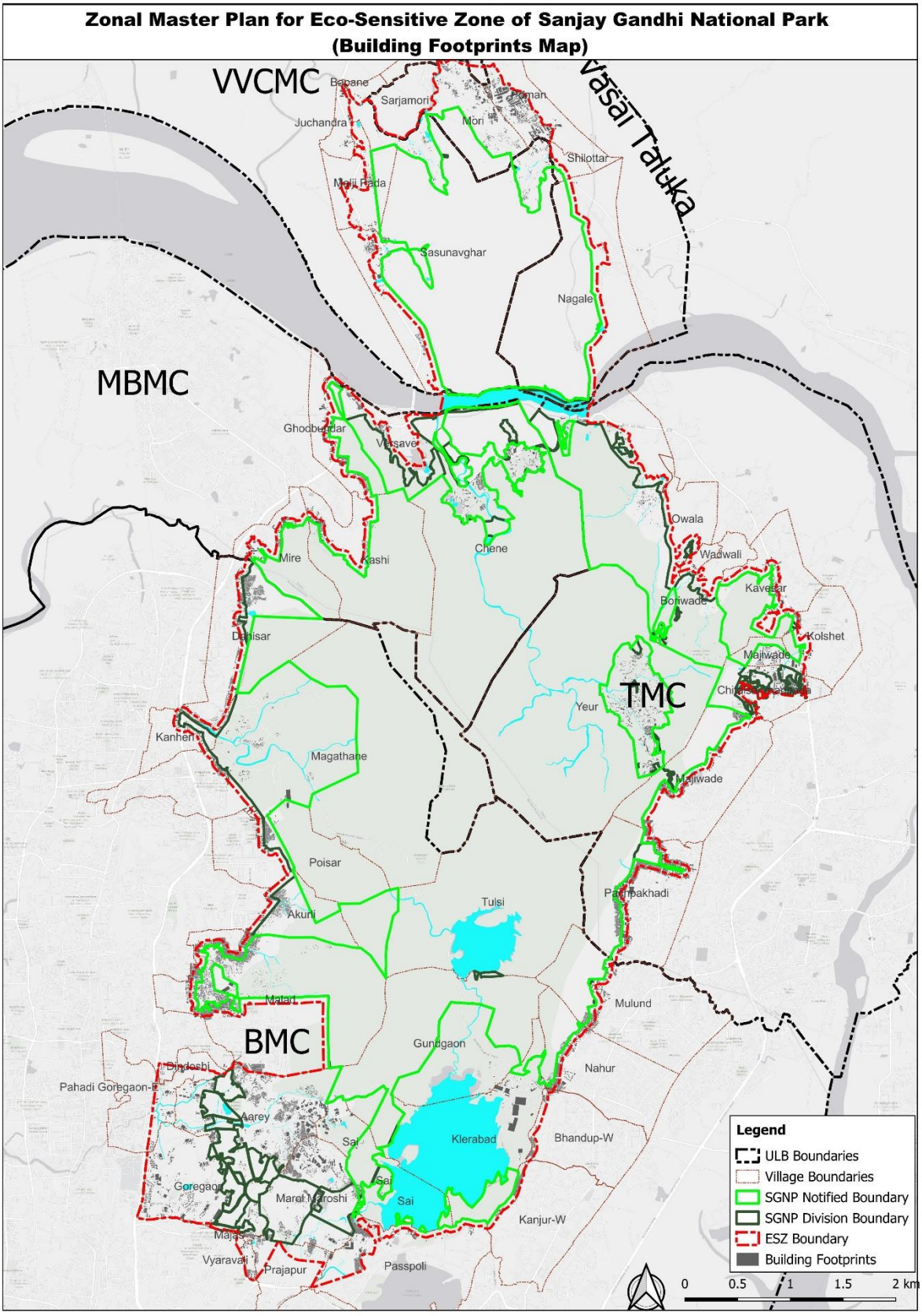
Human footprints, settlements, and infrastructure, indicate the extent of human intervention in natural landscapes. High human activity often leads to habitat destruction, deforestation, and pollution. Assessing footprints helps in understand the extent of penetration

Footprint cover Percentage	0-10%	10-25%	25-40%	40-60%	Above 60%
Scoring	5	4	3	2	1

Source: Consultant Analysis

Footprints were identified on drone imagery and analysed for their percentage coverage per grid. A higher footprint coverage resulted in a lower score, as it indicated environmental degradation.

Figure 6.22 Building Footprints Map of ESZ of SGNP



Source: Consultant Analysis

6.8.2.2 Existing Land Use

Land use patterns, are important aspect to study the environmental richness and vulnerability. Primary survey was conducted to study the Existing land use and GIS Based map was Generated. Different land use of area under each grid was calculated and was multiplied by the individual scoring to normalize the score of multiple land uses in one grid

5	4	3	2	1
Most Beneficial	Beneficial	Least Harmful	Harmful	Most Harmful
Green Area	Agriculture	Public and Semi-public buildings	Residential	Industrial
Wetlands	Recreational	Health	Commercial	Slum
Eco sensitive Zones	Cowsheds	Education	Mixed	Traffic and Transportation
	Vacant lands	Religious		

Source: Consultant Analysis

Existing land use was categorized based on its environmental impact, with rankings reflecting the extent of built-up areas, pollution levels, and ecological disruption. The most harmful zones include industrial areas, slums, transportation hubs, traffic-related infrastructure, and wastelands, as they contribute to severe environmental degradation through high pollution, resource consumption, and habitat destruction. High harmful impact areas, such as residential and commercial zones, mixed-use areas, roads, government properties, and vacant lands, involve significant built-up structures but may still allow for some environmental management. Moderate harmful impact areas include public utilities, recreational spaces, healthcare facilities, and religious sites, which, while developed, can incorporate sustainable practices and green spaces. Low harmful impact zones, such as agricultural land, communication infrastructure, and specific planned zones, retain a balance between built-up structures and open spaces, mitigating their ecological footprint. Finally, the least harmful areas, including eco-sensitive zones, green spaces, wetlands, offer major ecological benefits by preserving biodiversity, improving air and water quality, and supporting sustainable land use.

AMIT KUMAR RAJHANS

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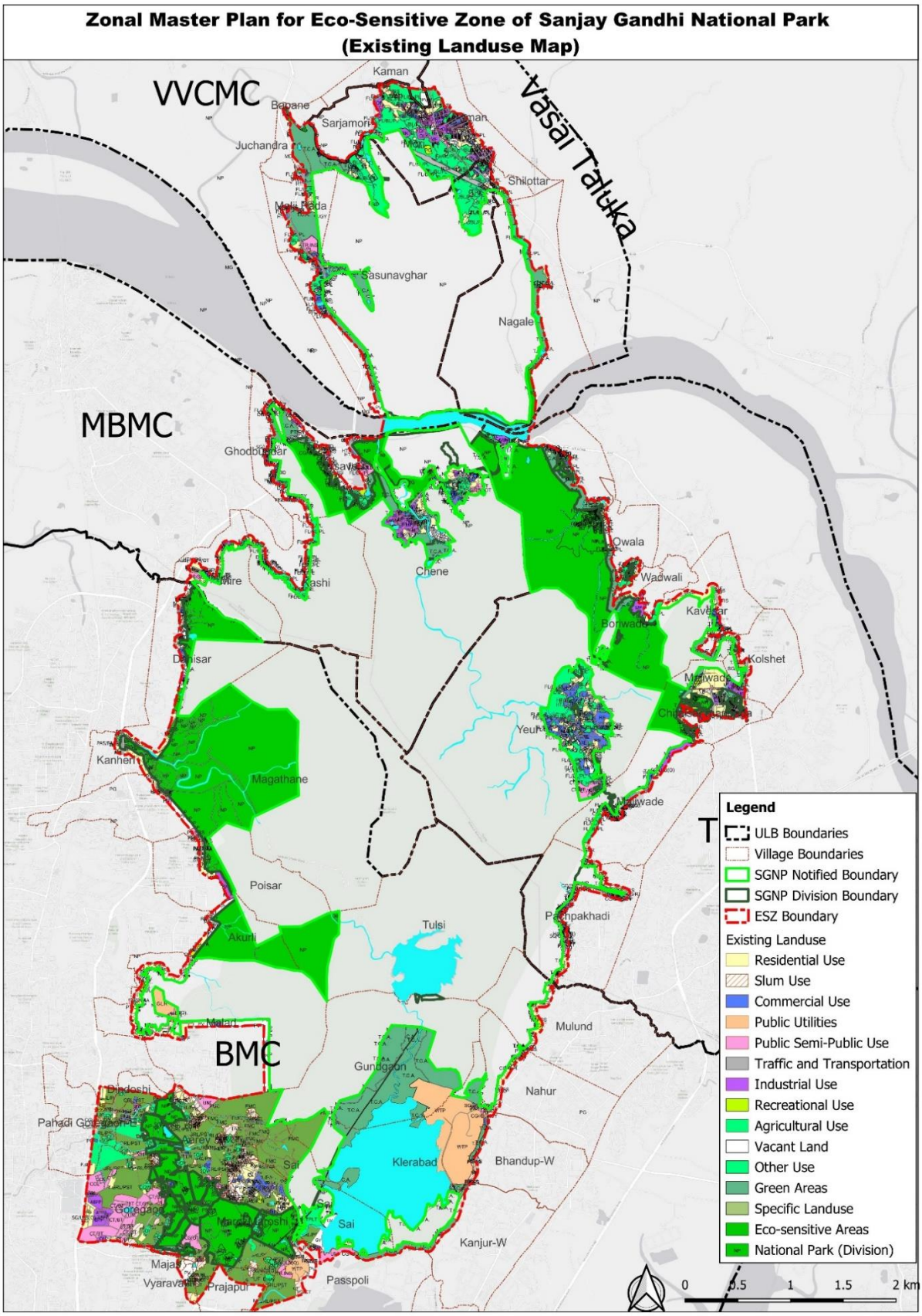
Figure 6.23 Existing Land use and Activity Map of ESZ of SGNP, BMC and MBMC



Source: Consultant Analysis

6.8.2.3 Slums/Encroachments

Unplanned settlements and encroachments lead to deforestation, loss of green spaces, and pollution. These areas often lack proper waste management, contributing to soil and water contamination. High population density in slum areas exerts pressure on natural resources, leading to environmental degradation.

Slum Cover Percentage	0-20%	20-40%	40-60%	60-80%	Above 80%
Scoring	5	4	3	2	1

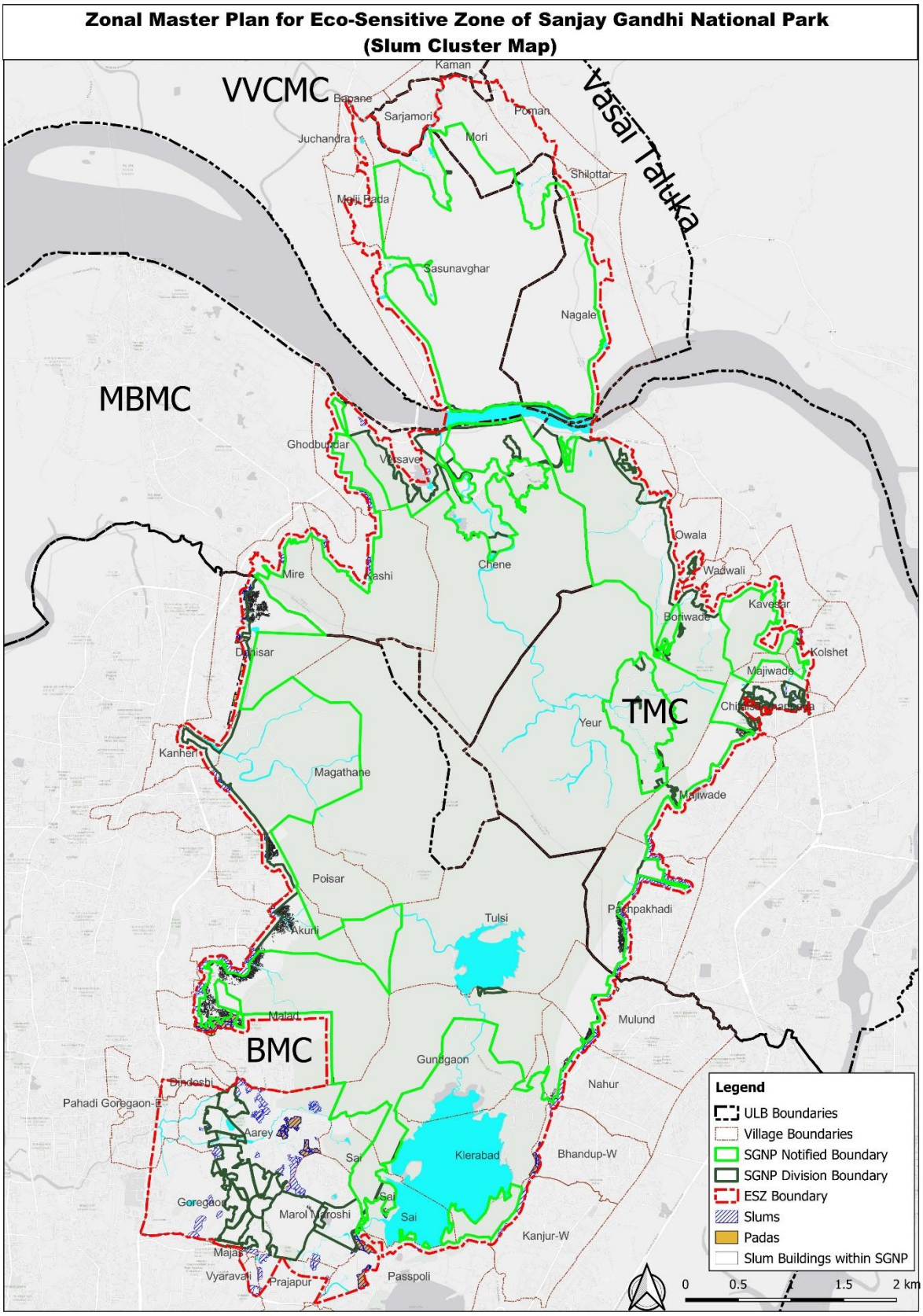
Source: Consultant Analysis

Notified Slum Boundaries were obtained from slum rehabilitation authorities and non-notified slums were identified from the building features and primary survey. The percentage score was obtained in each grid and score was calculated accordingly.

6.8.2.4 Population Density

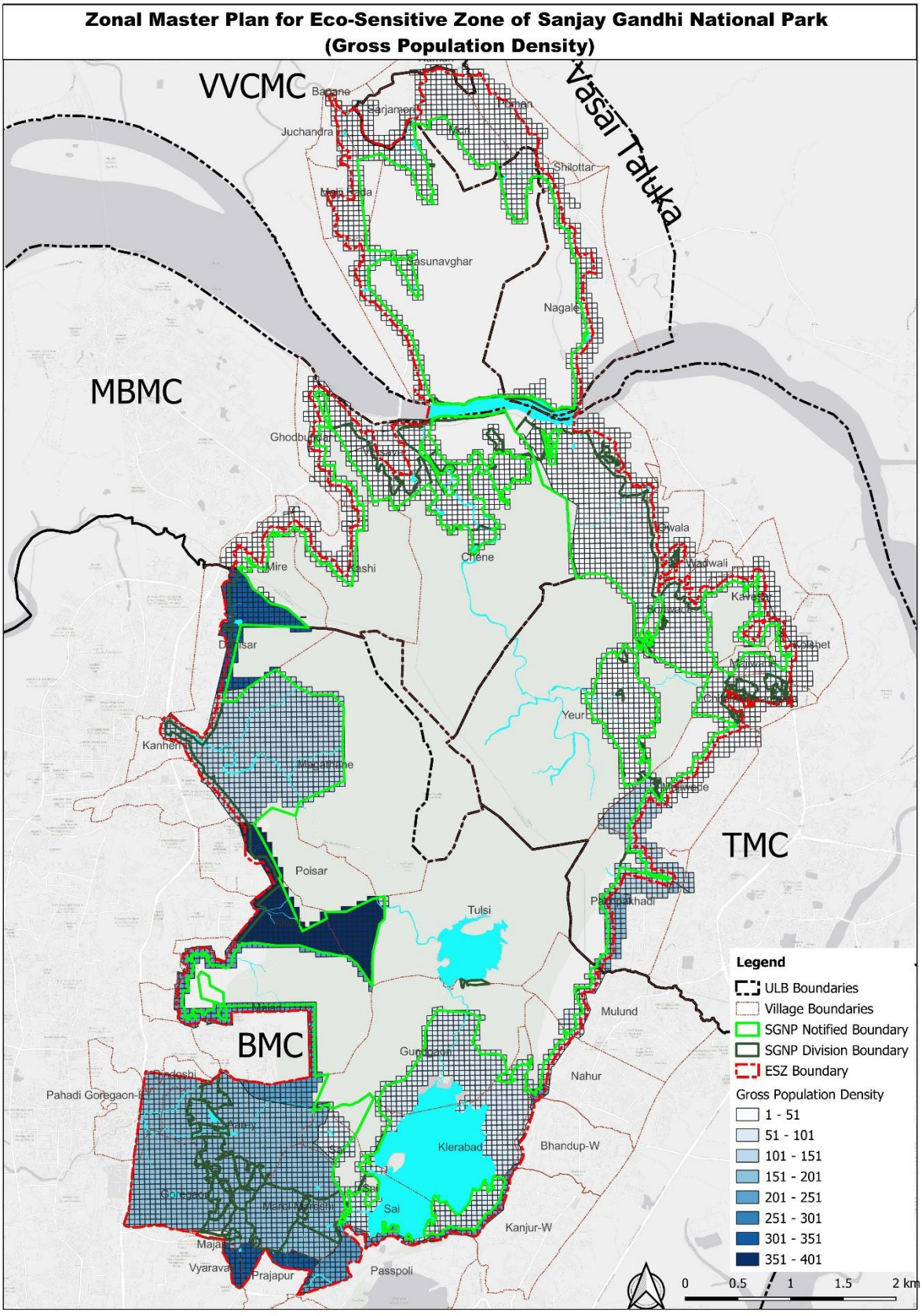
High population density increases resource consumption, waste generation, and pollution. Urban expansion reduces forest cover and disrupts natural ecosystems. Overcrowded areas experience poor air quality, water scarcity, and increased vulnerability to environmental hazards. This factor is essential to study the depletion of the resources. Scoring is done as higher the Densities lesser the score. It is done by identifying the highest and lowest densities present in the area.

Figure 6.24 Slum Clusters in ESZ of SGNP, BMC and MBMC



Source: Consultant Analysis

Figure 6.25 Population Density of wards in ESZ



Source: Consultant Analysis

6.8.3 Disasters and Conflicts

6.8.3.1 Human Animal Conflict

Human-wildlife conflicts arise when natural habitats shrink due to deforestation and urbanization. Wildlife venturing into human settlements can lead to loss of biodiversity and pose risks to both animals and people. As per a technical report published on Human-Animal Wildlife Conflict in Uttarakhand, a buffer of 500m was taken around previously observed conflict locations. However, SGNP being surrounded by urban areas on all the sides, cautious zone of 250m has been taken in order to identify the overlay for human-animal conflict across ESZ. (Assessment of socio psychological perspectives and actual threat from Leopard in Motichur Range, Dec 2019)

Zone	Conflict points	Immediate danger zone	Cautious Zone	Buffer zone	Safe Zone
Distance	0	100m	250m	500m	Rest of the area
Score	1	2	3	4	5

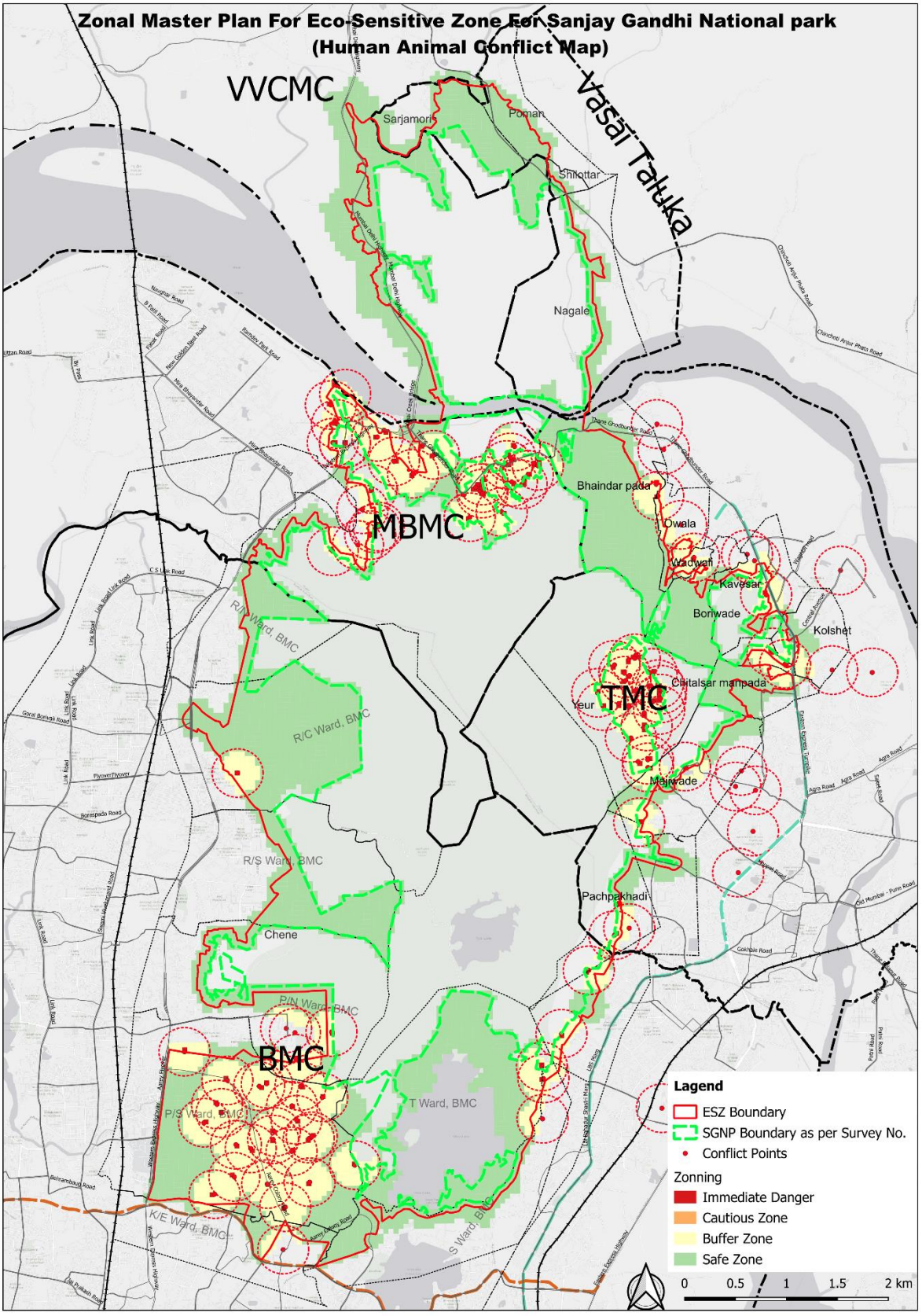
Source: Consultant Analysis

Human animal conflict points were obtained from the Forest Department, and buffer maps were created based on policies and frameworks relevant to the Indian context. Different distances were classified into conflict zones, immediate danger zones, cautious zones, and buffer zones. Scores were assigned to each grid accordingly, while the remaining grids were designated as safe zones.

6.8.3.2 Flood Prone Area

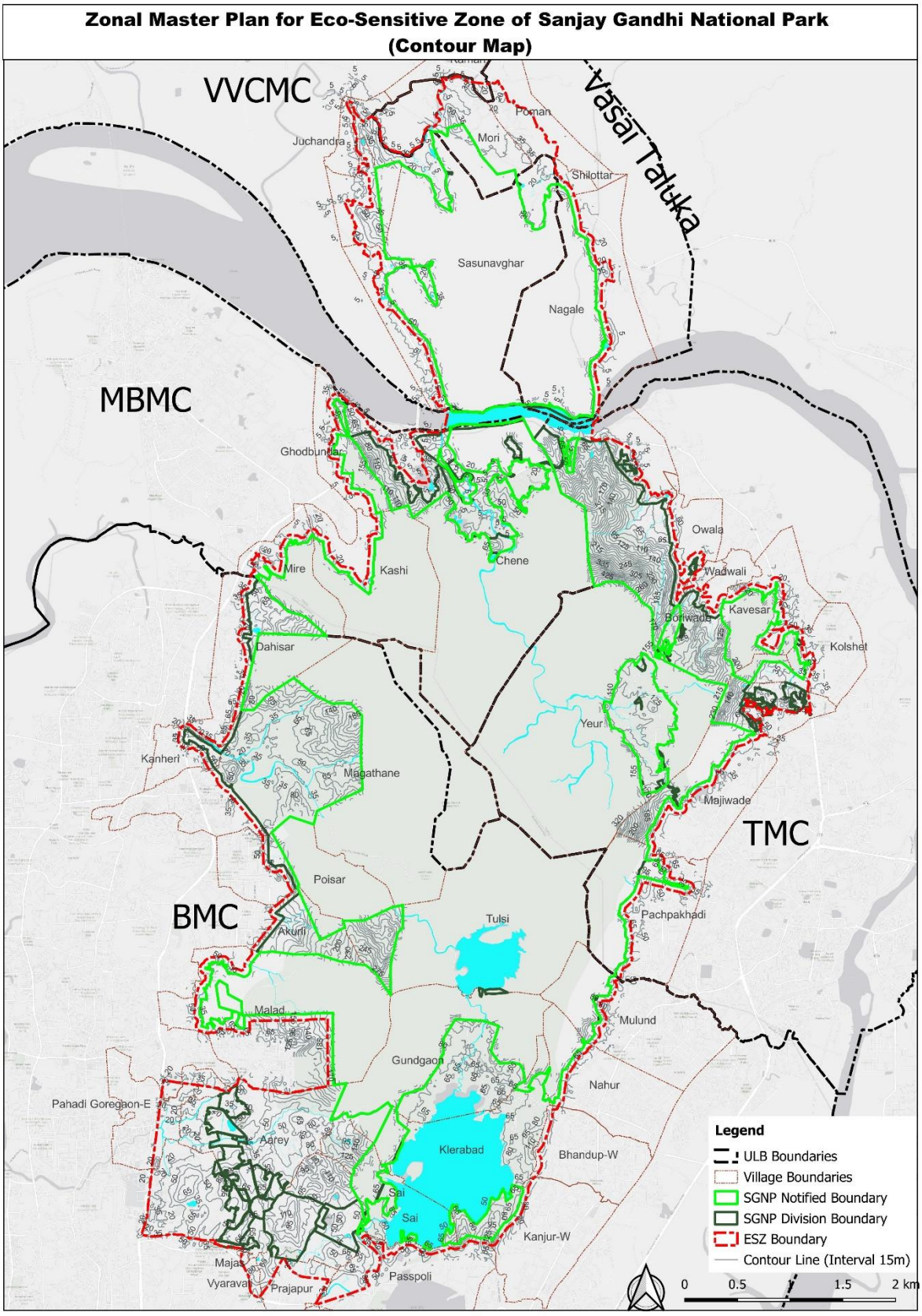
Flood-prone areas refer to regions within and around SGNP that experience waterlogging, flash floods, or seasonal inundation due to heavy monsoon rains and poor drainage. To study this Contour maps were generated and highest and lowest points were identified. Elevation above 100m were given highest score and lowest values were divided into scale and were scored accordingly.

Figure 6.26 Human Animal Conflict Map of ESZ of SGNP



Source: Consultant Analysis

Figure 6.27 Contour Map of ESZ



Source: Consultant Analysis

6.8.4 Fauna

The parameter for scoring was done from the data obtained from biodiversity survey. The data was normalized according to count of species and its recurring percentage value of the species.

6.8.4.1 Fauna Density

Fauna density indicates the number of animal species in a given area, reflecting habitat quality and ecosystem stability. High fauna density suggests a thriving environment with sufficient resources, while low density may indicate habitat degradation or resource scarcity. A decline in fauna density often signals environmental stress due to deforestation, climate change, or human activities. Overcrowding, on the other hand, can lead to competition for resources, affecting species survival. Monitoring fauna density helps in assessing biodiversity health and guiding conservation efforts.

The count was obtained from biodiversity survey the highest and lowest density values were obtained and were scored by categorising it into scale of 5.

6.8.4.2 Fauna Age

Fauna age distribution provides insights into population stability, reproductive success, and species survival. A balanced age structure ensures healthy population dynamics, while an aging or juvenile-skewed population may indicate ecological stress. Factors such as habitat loss, hunting, and food shortages can disrupt age distribution, affecting long-term species sustainability. Monitoring fauna age helps detect changes in breeding patterns and environmental pressures.

Age	Old/Matured	Adult	Juvenile
Score	5	3	1

Source: Consultant Analysis

6.8.4.3 Fauna Health

Fauna health is a key indicator of environmental conditions, reflecting habitat quality, pollution levels, and disease prevalence. Poor fauna health often signals pollution, food scarcity, or climate-induced stress. Disease outbreaks in wildlife can also impact ecosystems and even pose risks to human health. Monitoring fauna health helps detect environmental imbalances and guides conservation interventions.

Health	Healthy	Unhealthy	Irrecoverable
Score	5	3	1

Source: Consultant Analysis

6.8.4.4 Fauna Location

Animal distribution refers to the spatial presence of domesticated, stray, and wild animals in an ecosystem. Changes in distribution patterns often indicate habitat disturbances, urban expansion, or resource availability shifts. Stray animals, often a result of human neglect, can disrupt local wildlife and spread diseases. Wild animals facing habitat loss may enter human settlements, leading to conflicts. Understanding animal distribution helps in wildlife management, urban planning, and conservation efforts.

Distribution	Wild	Stray	Domesticated
Score	5	3	1

Source: Consultant Analysis

6.8.4.5 Fauna Natal Dispersion

Fauna natal dispersal plays a crucial role in genetic diversity and population connectivity. Limited dispersal due to habitat fragmentation can lead to isolated populations and reduced adaptability to environmental changes. Human-made barriers such as roads and urban expansion often restrict dispersal, increasing extinction risks. Creating wildlife corridors helps maintain natural movement and species survival. Ensuring safe dispersal pathways supports biodiversity and ecosystem balance. This was done by studying research papers and scoring them accordingly.

6.8.5 Flora

The parameter for scoring was done from the data obtained from biodiversity survey. The data was normalized according to count of species and its recurring percentage value of the species

6.8.5.1 Flora Density

Flora density refers to the number of plant species within a specific area, indicating vegetation cover and ecosystem productivity. High flora density supports biodiversity by providing food, shelter, and oxygen for various organisms. Low flora density may result from deforestation, overgrazing, or soil degradation, leading to habitat loss and increased vulnerability to erosion. Dense vegetation helps in carbon sequestration, improving air quality and climate resilience. Monitoring flora density is crucial for assessing habitat quality and implementing conservation strategies.

The count was obtained from biodiversity survey the highest and lowest density values were obtained and were scored by categorising it into scale of 5

6.8.5.2 Flora Age

Flora age indicates the maturity and life cycle stage of plant species within an ecosystem. A diverse age structure, with a mix of young and mature plants, ensures natural regeneration and ecological stability. A lack of young plants may signal deforestation, soil degradation, or poor seed dispersal. Older vegetation plays a crucial role in carbon sequestration and providing habitats for wildlife. Monitoring flora age helps assess forest sustainability and the long-term health of an ecosystem.

Age	Heritage	Mature	Juvenile
Score	5	3	1

Source: Consultant Analysis

6.8.5.3 Flora Health

Flora health reflects the overall condition of vegetation, influenced by factors such as soil quality, pollution, and climate conditions. Unhealthy plants may exhibit signs of disease, nutrient deficiencies, or physical damage from human activities. Declining flora health can indicate environmental degradation, affecting biodiversity and ecosystem services. Healthy flora supports wildlife, improves air quality, and enhances climate resilience.

Health	Healthy	Diseased	Irrecoverable
Score	5	3	1

Source: Consultant Analysis

6.8.5.4 Flora Location

Flora location refers to the spatial distribution of plant species across different ecosystems. Changes in flora location can result from deforestation, urbanization, or shifting climate conditions. Certain plant species serve as bioindicators, reflecting soil fertility and water availability. Mapping flora locations helps identify critical habitats that require protection and restoration.

Location	Wild	Developed area	Road Side
Score	5	3	1

Source: Consultant Analysis

6.8.5.5 Flora Permeance

Flora permanence refers to the longevity and stability of plant species in a given area, categorized into seasonal, annual, and perennial vegetation. Seasonal plants grow and die within a short period, responding to specific climatic conditions, making them the least stable. Annual plants complete their life cycle within a year, requiring continuous regeneration, which can make ecosystems more vulnerable to environmental stress. Perennial plants, which live for multiple years, provide long-term ecological benefits such as soil stabilization, carbon storage, and sustained habitats for wildlife, making them the most environmentally valuable. Ecosystems with a higher presence of perennial plants tend to be more resilient, whereas areas dominated by seasonal or annual flora are more susceptible to degradation and habitat loss

Permeance	Perennial	Seasonal	Annual
Score	5	3	1

Source: Consultant Analysis

6.8.5.6 Flora Natal Dispersion

Flora natal dispersion refers to the spread of seeds and young plants from parent vegetation to new areas. Effective dispersion promotes plant diversity, ecosystem regeneration, and habitat expansion. Factors like wind, water, and animals aid natural dispersion, while habitat fragmentation can limit seed spread. Poor dispersal can lead to reduced plant populations and lower biodiversity. Conservation strategies, such as habitat connectivity and reforestation, enhance flora natal dispersion for ecosystem sustainability. This was done by literature review for the subject and scoring them accordingly.

6.8.6 AHP - Pairwise Comparisons

Experts or stakeholders are asked to perform pairwise comparisons between the criteria and sub criteria to establish their relative importance. Each criterion was compared based on relative scale and its reverse.

Table 6.17: Comparative Scoring of Importance for pairwise comparisons in AHP for vulnerability Analysis

Level of criticalness	Definition	Explanation
1	Equal Importance	Both elements have equal contribution in the objective
3	Moderate importance	Moderate advantage of one element compared to other
5	Strong Importance	Strong favouring of one element compared to other
7	Very Strong Importance	one element is strongly favoured and has domination in practise, compared to the other element
9	Extreme Importance	one element is favoured in comparison with the other, based on strong proved evidences and facts

Source: Consultant Analysis

The values 1/3, 1/5, 1/7, and 1/9 were used for inverse comparisons. These values were then input into spreadsheet to construct a matrix. This process was repeated for all pairs of sub-criteria, resulting in the creation of a comprehensive matrix of comparisons. For better understanding and clarity, the table of main criteria is provided below, and the remaining tables of sub-criteria matrices are attached in the Annexure VII.

Table 6.18: Pairwise comparison matrix for Criteria for AHP – Vulnerability Analysis

Criteria	Soil & Surface (C1)	Built Form (C2)	Disasters & Conflicts (C3)	Fauna (C4)	Flora (C5)
Soil & Surface (C1)	1	1	7	5	5
Built Form (C2)	1	1	7	5	5
Disasters & Conflicts (C3)	0.142857	0.142857	1	0.333333	0.3333333
Fauna (C4)	0.2	0.2	3	1	1
Flora (C5)	0.2	0.2	3	1	1
SUM	2.542857	2.542857	21	12.33333	12.333333

Source: Consultant Analysis

6.8.7 Weight Calculation

Using the pairwise comparison matrix, AHP calculates the relative weights of each criterion. These weights reflect how much influence each criterion should have in the final vulnerability assessment. The calculation process ensures that the subjective judgments of experts are quantified and consistently applied across all criteria.

Its first step is normalising the data to calculate the weight of each criterion, the matrix must be normalized. Normalization involves dividing each element in the matrix by the sum of the column it is in. This ensures that each column adds up to 1.

For Soil and Surface criteria the sum of column is 2.542857 Normalize each element:

- Soil & Surface (C1) = 1/2.542857 = 0.3933
- Built Form (C2) = 1/2.542857 = 0.3933

- Disasters & Conflicts (C3) = 0.142857/2.542857 = 0.0562
- Fauna (C4) = 0.2/ 2.542857 = 0.0787
- Flora (C5) = 0.2/ 2.542857 = 0.0787

This normalization process is done for all columns. After normalizing the matrix, the next step is to calculate the average of each row. This gives the relative weight of each criterion. Each weight represents the importance of a criterion in relation to the others.

Criteria	C1	C2	C3	C4	C5	Total	Criteria weights (Avg)
C1	0.3933	0.3933	0.3333	0.4054	0.4054	1.9307	0.3861
C2	0.3933	0.3933	0.3333	0.4054	0.4054	1.9307	0.3861
C3	0.0562	0.0562	0.0476	0.0270	0.0270	0.2140	0.0428
C4	0.0787	0.0787	0.1429	0.0811	0.0811	0.4623	0.0925
C5	0.0787	0.0787	0.1429	0.0811	0.0811	0.4623	0.0925

Source: Consultant Analysis

A key aspect of AHP is checking the consistency of the judgments made during the pairwise comparisons. A consistency ratio (CR) is calculated to ensure that the comparisons are logically consistent. A CR less than 0.1 is typically considered acceptable. If the CR is too high, it indicates that the judgments may be inconsistent and need to be revised.

The consistency ratio CR is calculated by:

Dividing the consistency index (CI) by the random index (RI), which is based on the size of the matrix.

The formula for consistency index (CI) is: CI = (λmax - n) / (n - 1) Where: λmax is the largest eigenvalue of the pairwise comparison matrix which is obtained by summation of solving the initial matrix and multiplying it but the corresponding weight. and n is the number of criteria. Random index (RI) depends upon the number of criteria

n	1	2	3	4	5	6	7	8	9	10
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49

For this criteria matrix the number of criteria were 5 hence the random index (RI) is 1.12

Criteria weights (Average)	Comparison Matrix (By solving the initial scoring matrix
0.3861	5.170653
0.3861	5.170653
0.0428	5.017296
0.0925	5.059254
0.0925	5.059254

- λmax (Largest Eigenvalue): λmax = 5.095422
- Consistency Index (CI): CI = (λmax - n) / (n - 1)
- = (5.095422 - 5) / (5 - 1) = 0.023855

Consistency Ratio (CR): CR = CI / RI = 0.023855 / 1.12 = 0.021299 which is less than 0.1 hence this is acceptable. In similar way the rest of the Sub criteria are calculated, the calculation tables are attached in the Annexure-VII.

6.9 Final Vulnerability Score Calculation

The weighted scores for each criterion are combined to calculate an overall vulnerability score for each grid. This score represents the relative vulnerability of each grid within the eco-sensitive zone, with higher scores indicating grids with greater environmental value. The areas are then ranked based on their scores, providing a clear indication of regional context. This is done by multiplying criteria weight to the sub criteria weight. Ranking is then established based on this.

Table 6.19: Global Weight Calculation for Vulnerability Analysis - AHP

Criteria	Criteria code	Criteria Weights	Sub-Criteria	Sub-Criteria Code	Sub-Criteria Weights	Global weights
Soil & Surface	C1	0.386132	Slope	C1.1	0.09125628	0.03524
			Soil type	C1.2	0.11230891	0.04337
			Tree Cover	C1.3	0.56761598	0.21917
			Water body presence	C1.4	0.18254076	0.07048
			Surface Contamination (Presence of Foreign substances)	C1.5	0.04627808	0.01787
Built Form	C2	0.386132	Footprints	C2.1	0.08318381	0.03212
			Existing Landuse	C2.2	0.35720694	0.13793
			Slums/ encroachments	C2.3	0.3988736	0.15402
			Population Density	C2.4	0.16073565	0.06207
Disasters & Conflicts	C3	0.042807	Human Animal Conflicts	C3.1	0.125	0.00535
			Flood Prone areas	C3.2	0.875	0.03746
Fauna	C4	0.092465	Fauna Density	C4.1	0.50345161	0.04655
			Fauna Natal Dispersal Distance	C4.2	0.03288697	0.00304
			Fauna Age	C4.3	0.14340065	0.01326
			Fauna Health	C4.4	0.2641804	0.02443
			Fauna Location	C4.5	0.05608036	0.00519
Flora	C5	0.092465	Flora Density	C5.1	0.33728034	0.03119
			Flora Natal Dispersal Distance	C5.2	0.02623473	0.00243
			Flora Age	C5.3	0.08627213	0.00798

			Flora Health	C5.4	0.31554121	0.02918
			Flora Location	C5.5	0.1681724	0.01555
			Flora Permanence	C5.6	0.0664992	0.00615

Source: Consultant Analysis

The most critical factor in understanding environmental vulnerability and richness is Tree Cover (Rank 1), as it plays a fundamental role in maintaining biodiversity, enhancing carbon sequestration, regulating temperature, and stabilizing the ecosystem. It prevents soil erosion, mitigates the urban heat island effect, and provides habitat for numerous species, making it the primary indicator of environmental health. Slums/Encroachments (Rank 2) and Existing Land Use (Rank 3) highlight the impact of human settlements and activities on the environment. Unplanned urban expansion, deforestation, and industrial growth contribute to habitat destruction, pollution, and resource depletion. Water Body Presence (Rank 4) is crucial for biodiversity, serving as a life source for flora and fauna, influencing microclimate, and reducing temperature variations. Population Density (Rank 5) directly affects land consumption, waste production, and pollution levels. Areas with high population density often experience environmental degradation due to overexploitation of natural resources, loss of vegetation, and increased carbon emissions. Fauna Density (Rank 6) is an essential indicator of ecosystem health, showing the richness of wildlife populations in an area. A high fauna density suggests a thriving habitat, while a decline indicates ecological stress. Soil Type (Rank 7) determines land fertility, water retention, and erosion resistance. The nature of the soil impacts vegetation growth, agricultural productivity, and the ability to withstand environmental changes. Flood-Prone Areas (Rank 8) and Slope (Rank 9) play key roles in land stability, disaster risk, and erosion control. Steep slopes are prone to landslides, while low-lying areas are susceptible to flooding, affecting both human settlements and natural ecosystems. Footprints (Rank 10) measure direct human presence in an area, including urbanization, deforestation, and resource extraction. High human activity leads to soil degradation, loss of wildlife habitat, and pollution.

Flora Density (Rank 11) and Flora Health (Rank 12) indicate the richness and quality of vegetation cover. Healthy flora supports carbon absorption, biodiversity, and climate resilience. Fauna Health (Rank 13) and Surface Contamination (Rank 14) reflect environmental degradation. Polluted land and water sources negatively impact both flora and fauna, disrupting ecosystems and posing health risks to human populations. Flora Location (Rank 15) and Fauna Age (Rank 16) influence species movement and habitat stability. Fragmented vegetation affects connectivity between ecosystems, while an imbalanced age distribution in wildlife suggests reproductive and survival challenges. Flora Age (Rank 17) and Flora Permanence (Rank 18) determine long-term ecological sustainability. Young forests absorb more carbon, while older forests provide stable ecosystems. Areas with permanent vegetation are more resilient to environmental stress compared to those with seasonal plant cover. Human animal Conflicts (Rank 19) arise when wildlife habitats shrink due to human encroachment, leading to risks for both animals and people. Fauna Location (Rank 20) plays a key role in conservation, as fragmented habitats make species more vulnerable to extinction. Fauna Natal Dispersal Distance (Rank 21) and Flora Natal

Dispersal Distance (Rank 22) determine species' ability to regenerate and adapt. If dispersal distances are limited, habitat fragmentation increases, making ecosystems more vulnerable.

Thus, the higher-ranked factors, particularly Tree Cover, Land Use, and Water Body Presence, have the most immediate impact on assessing environmental vulnerability and richness. Human activities, ecosystem health, and disaster risks play major roles in shaping environmental conditions.

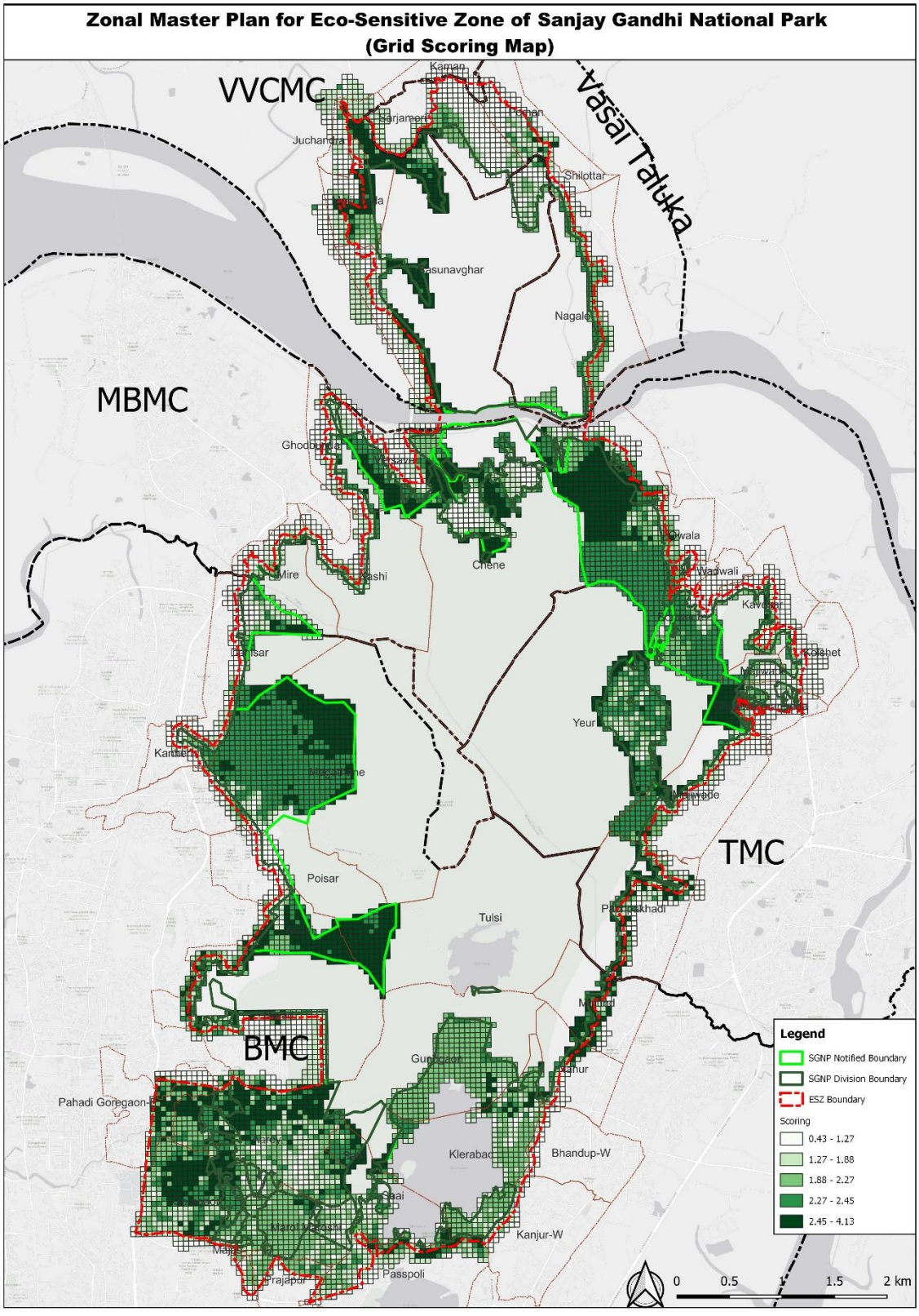
6.9.1 Ranking of Grids

The individual scoring of each grid is multiplied by its corresponding global weight to determine the final score. This ensures that each factor is evaluated based on its relative significance in assessing environmental vulnerability and richness. The final scores are then normalized on a scale ranging from 1 to 5, aligning with the selected standard. Consequently, the final scoring for each grid falls within the range of 0 to 5, where higher scores indicate greater environmental value. A higher score signifies a more ecologically rich and significant area, emphasizing its importance in conservation and sustainable planning.

6.9.2 Vulnerability Index Map

The Grid wise map showing the Vulnerability Index is given below

Figure 6.28: Grid wise Vulnerability Index for ESZ of SGNP



Source: Consultant Analysis

6.9.3 Inference from the Vulnerability Analysis

As per the analysis carried out for Eco-Sensitive Zone of Sanjay Gandhi National Park based on Multi Criteria Decision Making method, the higher values implies that those areas are environmentally rich and its ecology has to be preserved. These areas are immediate extension of the forest area with similar characteristics. And lower values implies that those areas are with high concentration of developments and best suited for it.

The areas which are presently under settlements are categorized in ESZ-1 since they are best suited for it and the same can be continued over.

In order to preserve the areas with higher values, ESZ-2 has been proposed over those areas so that no degradation of those areas happen such as Versave, Ghodbunder, Kashi and Mire. These areas will be following strict measures in order to preserve the ecology.

Areas which are very important from ecological point of view and have high scoring in the vulnerability analysis are categories as ESZ-3 such as area under Mangroves near Versave and Vasai Creek area.

7 TOURISM MASTER PLAN

SGNP is inhabited by a staggering variety of plant and animal life, such as leopards, spotted deer, bonnet macaques, and birds. The fact that these species inhabit the park underlines the park's significance in urban wildlife conservation. SGNP also contains ancient historical monuments like the Kanheri Caves, a series of rock-cut Buddhist caves dating from the 1st century BCE, which are a rich source of information regarding India's cultural and religious past. Other significant heritage sites, including the Gandhi Tekdi, also contribute to the park's historical importance.

This Tourism Master Plan is designed to establish a strategic framework for balancing conservation and sustainable tourism development. The strategy focuses on sustainable tourism practices that reduce ecological disruptions and improve visitor experience through well-planned infrastructure, educational activities, and environmentally friendly initiatives.

Through efficient visitor management, green infrastructure development, and community engagement, this plan aims to maintain SGNP's natural and cultural resources and ensure that tourism is positively affecting conservation. Overall, the vision is to establish SGNP and its ESZ as a model for urban conservation of biodiversity and eco-tourism and to demonstrate how natural and historic heritage can be integrated into a modern city without diluting ecological integrity.

7.1 Vision & Objectives

7.1.1 Vision:

The vision for SGNP is to establish it as a benchmark for sustainable tourism, harmonizing conservation, cultural heritage preservation, and responsible visitor engagement. The aim is to create a rich experience for tourists, scientists, and local communities, where both the natural and historical assets are enjoyed and actively preserved.

7.1.2 Objectives of the Tourism Master Plan:

a. Conservation of Biodiversity: The core objective is to safeguard and restore SGNP’s diverse flora and fauna. Efforts will focus on preventing habitat degradation, curbing encroachments, and enhancing reforestation initiatives. Establishing wildlife corridors and buffer zones will ensure ecological balance and provide safe movement for animals. Collaboration with research institutions and environmental organizations will ensure continuous biodiversity monitoring.
b. Sustainable Tourism Development: Promoting eco-friendly tourism is a key objective, with an emphasis on infrastructure and practices that minimize human impact while enriching the visitor experience. This includes the development of nature trails, observation decks, eco-lodges, and initiatives for carbon-free tourism. Waste management systems and sustainable transportation options, such as electric shuttle buses and bicycle rentals, will also be prioritized to reduce environmental harm.
c. Integration of Environmental Protection and Tourism Infrastructure: The master plan aims to integrate environmental protection with tourism

infrastructure, ensuring that development initiatives align with conservation goals. Special attention will be given to eco-sensitive infrastructure, such as waste management systems, recycling, and composting. This approach will support sustainable tourism while preserving the park's ecological integrity.

d. Cultural and Heritage Conservation: Efforts will be made to protect and preserve SGNP's historical sites, including the Kanheri Caves, Shilonda Trail, and Gandhi Tekdi, through specialized conservation projects. Interactive digital interpretation centers and guided tours will be established to enhance visitor engagement with the park's rich cultural heritage.
e. Sustainable Community Development and Stakeholder Engagement: Community participation is vital to the long-term success of the plan. Local populations will be involved in eco-guiding, handicraft production, and other sustainable livelihood activities. These community-driven initiatives will generate economic benefits while preserving local traditions and knowledge. Additionally, targeted programs for environmental education, such as workshops, nature trails, and interactive learning centers, will foster a deep, long-term appreciation for nature and wildlife, particularly among children and young adults.
f. Monitoring and Enforcement: To ensure the continued success of conservation and tourism efforts, regular environmental impact assessments will be conducted, along with adaptive management strategies to address emerging challenges. These measures will ensure that SGNP's ecosystem remains protected while tourism develops in a sustainable manner.

The vision and objectives of this Master Plan aim to position SGNP as a leading example of eco-tourism, balancing biodiversity conservation, cultural heritage preservation, and community engagement in an urban-protected area.

7.2 Existing Tourist Attractions in SGNP - ESZ

Sanjay Gandhi National Park (SGNP) in Mumbai is one of the most accessible urban national parks in the world, offering a unique blend of natural beauty, wildlife, and historical significance. The park's Eco-Sensitive Zone (ESZ) is home to several popular tourist attractions that play a vital role in promoting both tourism and conservation. However, these attractions face a range of challenges due to the growing number of visitors and the need to balance tourism with environmental protection. This chapter highlights the key tourist attractions within SGNP, their associated problems, and proposes mitigation measures to ensure their sustainability.

The following are the existing Tourist locations and activities that are available within SGNP.

1. SGNP Biodiversity Park
    a. Mini Zoo
    b. Lion and Tiger safari
    c. Mini Train/Van Rani
2. Nature Trails & Trekking Routes
3. Mahatma Gandhi Smarak (Gandhi Tekdi)

4. Kanheri Caves

The following are the existing Tourist locations and activities that are available within ESZ of SGNP.

1. Film City
2. Chhota Kashmir
3. Upvan Lake

7.2.1 SGNP Biodiversity Park Zone

The SGNP Biodiversity Zone which is located at the entrance of the Sanjay Gandhi National Park, is developed as a Nature and wildlife based eco-tourism activity zone by the Sanjay Gandhi National Park and contains attractions for all age groups. The offices of the SGNP and the residential quarters of officials are also within the biodiversity zone. The facilities available in the biodiversity park, besides the tourist attractions are

- Nature Interpretation Centre
- Taxidermy Museum
- E - Golf carts for transport
- Boating facilities
- Cycling facilities including cycle Rentals
- Picnic areas
- Gardens & parks with various flora & fauna species

The following are the major attractions

7.2.1.1 Mini Zoo

The mini zoo at Sanjay Gandhi National Park (SGNP) currently houses native animals, but it is being phased out in accordance with the Central Zoo Authority (CZA) guidelines. In its place, a proposal for a new zoo spanning 100 hectares at Krishnagiri Upvan aims to provide improved facilities. The new zoo will offer enhanced enclosures for rescued wildlife, such as leopards and birds, and include eco-education centres to promote wildlife conservation awareness. The design will focus on creating a natural environment for the animals, incorporating modern zoo practices. If approved, the new zoo will not only function as a wildlife rehabilitation centre but also serve as an educational and research hub for tourists and conservationists alike.

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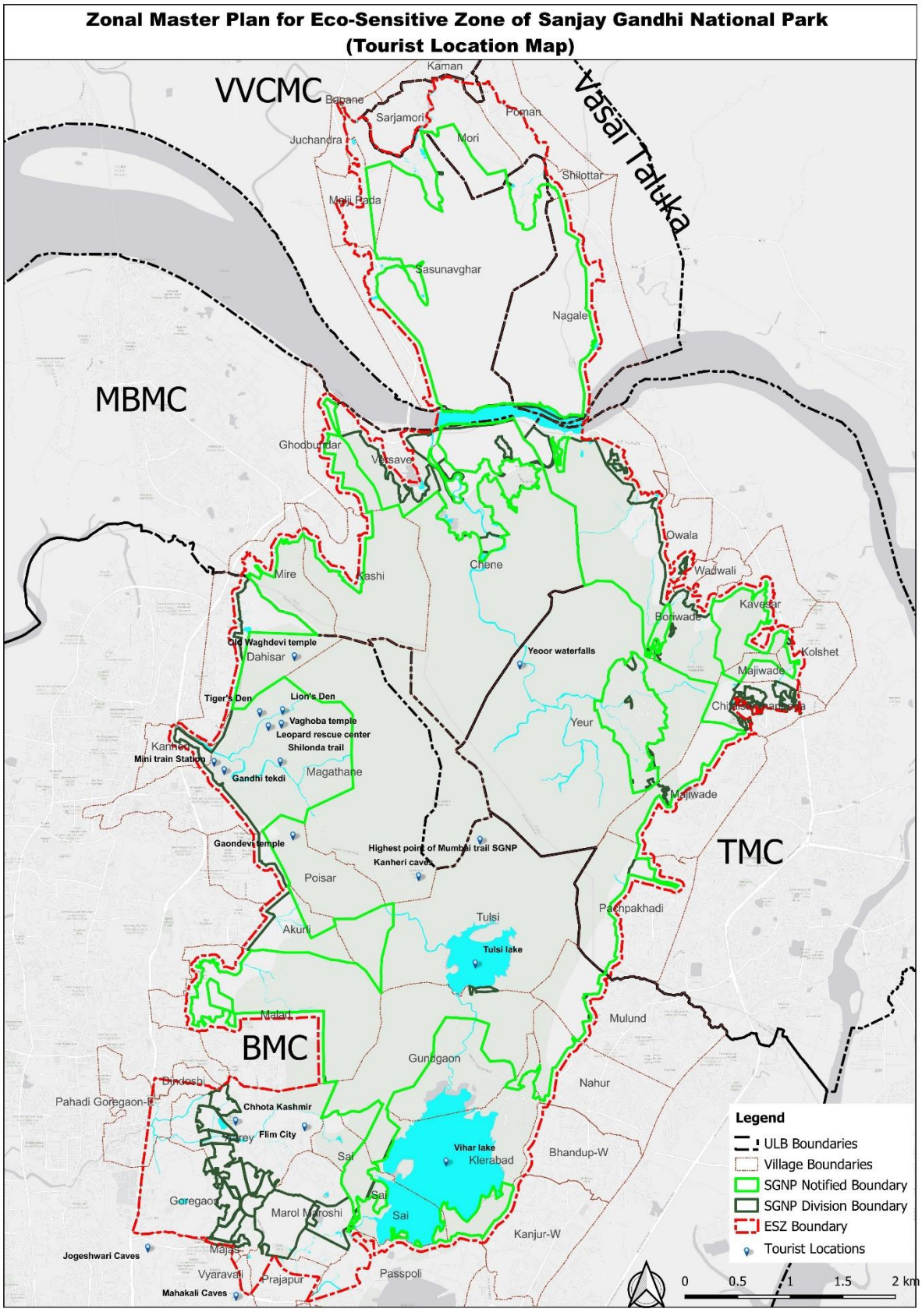
7.2.1.2 Lion & Tiger Safari

Sanjay Gandhi National Park (SGNP) offers a Lion and Tiger Safari spread across 20 hectares, designed to replicate the natural habitats of these majestic big cats. Visitors are safely guided in protected mini-buses, allowing them to observe the animals closely while ensuring their security. The safari includes barriers, moats, and designated viewing zones to prioritize the welfare and safety of the animals. To reduce stress on the big cats, visitor numbers are carefully regulated. This controlled environment provides a unique and exciting experience, particularly for children and wildlife enthusiasts, as they get an up-close look at these incredible creatures in a safe and ethical setting.

7.2.1.3 Mini Train (Van Rani)

The Van Rani (Forest Queen) Mini Train offers a 2.3 km circular joyride that provides scenic views of Sanjay Gandhi National Park (SGNP). The ride takes visitors through forested areas, grasslands, and animal enclosures, making it an ideal attraction for families and children. Passengers can spot a variety of wildlife, including deer, antelopes, and other herbivores, adding an educational element to the experience. The Van Rani Mini Train is a popular and relaxing way for visitors to explore the park, combining both enjoyment and learning about the natural environment.

Figure 7.1: Existing Tourist locations within ESZ of SGNP



Source: Consultant Analysis

7.2.2 Nature Trails & Trekking Routes

There are various nature trails and trekking routes that provide an opportunity to explore its diverse wildlife and enjoy stunning scenic views. Among the notable trails is the Lion Safari to Konkani Hill, a 4 km forested route where visitors can observe deer, birds, and butterflies, immersing themselves in the natural beauty of the park. The Mafco to Shilonda trail, at 1 km, is a beginner-friendly path that winds through the Shilonda grasslands, ideal for those new to trekking. For those seeking a more challenging experience, the Aarey Road to Bungalow 7 trail, stretching 6.7 km, offers a moderately difficult trek with sweeping views of Mumbai's skyline. These trails are best experienced early in the morning or between October and March, when wildlife activity is high, and the park's vegetation is lush.

7.2.3 Tourism Zones and Adventure Activities

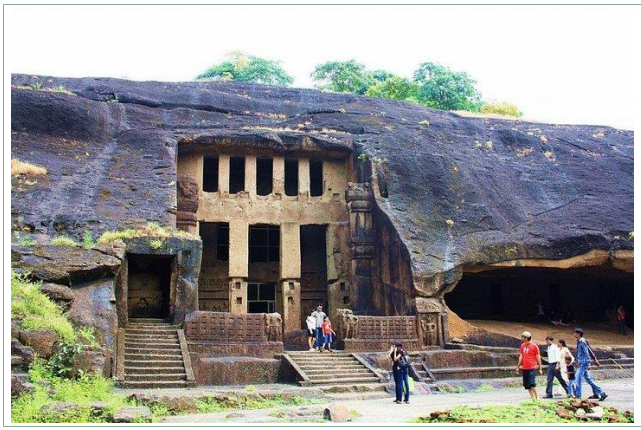
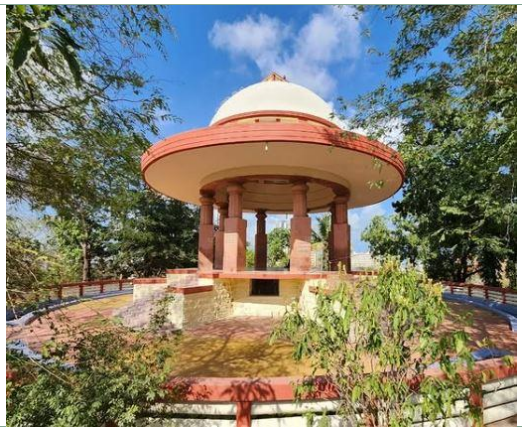
Sanjay Gandhi National Park (SGNP) actively promotes tourism by offering a variety of adventure activities that allow visitors to engage with nature in an exciting and sustainable manner.

7.2.4 Vihar Lake

The Vihar Lakes within Sanjay Gandhi National Park (SGNP) are essential water bodies for Mumbai and Thane, serving as crucial reservoirs. The surrounding forests provide excellent birdwatching opportunities, with a variety of species such as kingfishers, herons, and migratory waterfowl regularly spotted around the lakes. To protect water quality, boating is prohibited, but visitors can still enjoy the serene environment by engaging in activities like picnicking, photography, and nature walks along the lakeshores. These lakes offer a peaceful retreat for nature enthusiasts while contributing significantly to the region's water resources.

7.2.5 Kanheri Caves

The Kanheri Caves in Sanjay Gandhi National Park (SGNP) are a significant historical and archaeological site, with origins dating from the 1st century BCE to the 9th century CE. The cave complex consists of 109 caves, featuring intricately carved Buddha statues, stupas, and inscriptions that offer a glimpse into the region's Buddhist heritage. The largest cave, the Chaitya Hall, houses a massive stupa at its center, making it a prominent feature of the site. Accessible via a short trek, visitors can also enjoy stunning panoramic views of the surrounding city. The Kanheri Caves are a key destination for history lovers, architecture enthusiasts, and spiritual seekers, offering both cultural insight and a serene connection to nature.

7.2.6 Mahatma Gandhi Smarak

The Mahatma Gandhi Smarak in Sanjay Gandhi National Park (SGNP) is a tranquil memorial that offers breath-taking views of both Mumbai's skyline and the park's lush greenery. Accessible through a moderate hike, the site is a favourite among nature lovers and trekkers. It provides a serene environment perfect for relaxation, photography, and reflection. From this vantage point, visitors can appreciate the striking contrast between Mumbai's urban landscape and the park's pristine wilderness, making it a unique and peaceful spot within the park.

7.2.7 Film City

A Film City is a dedicated complex designed for filmmaking, television production, and media-related activities, offering facilities such as sound stages, outdoor sets, editing studios, and production offices. These hubs serve as one-stop destinations for filmmakers, providing all necessary resources for shooting, post-production, and distribution. Notable film cities around the world include Mumbai Film City and Ramoji Film City in India, Pinewood Studios in the UK, and Universal Studios in the USA. These locations have played a crucial role in shaping the global entertainment industry by supporting large-scale productions and fostering creativity in cinema and television.

7.2.8 Chhota Kashmir Boat Club

Chhota Kashmir in Aarey Colony, Mumbai, is a serene and picturesque spot known for its lush greenery, scenic lake, and tranquil atmosphere. Often referred to as a mini version of Kashmir due to its peaceful surroundings, it serves as a popular getaway for nature lovers, photographers, and couples seeking a quiet escape from the city's hustle. The area features a beautiful garden with vibrant flowers and a boating facility on the lake, making it a favorite picnic spot. Located within the expansive Aarey Milk Colony, Chhota Kashmir is a refreshing retreat that offers a glimpse of nature amidst the urban landscape of Mumbai.

7.2.9 Upvan Lake

Upvan Lake supports modest biodiversity due to its proximity to Yeoor Hills and Sanjay Gandhi National Park. The surrounding area hosts various bird species like egrets, herons, and kingfishers, especially during migratory seasons. Aquatic life

includes small fish and amphibians, while nearby vegetation attracts insects and butterflies, contributing to the lake's ecological value within the urban setting.

7.3 Tourism in ESZ in SGNP: Recommendations & Mitigation Measures

The following are the General Recommendations are applicable for eco-tourism promotion within ESZ of SGNP.

i. Respect wildlife: Maintain a safe distance from wildlife and do not feed them. Avoid loud noises or sudden actions that might startle animals.
ii. Stay on designated trails: Remain on designated paths to protect fragile habitats. Prevent harm to plants and animals by avoiding off-trail walking or entering restricted zones.
iii. Leave no trace: Take all your trash with you and dispose of it responsibly. Do not litter, and help keep the area clean by picking up any litter you find and placing it in proper bins.
iv. Reduce noise to preserve the park's peace and protect wildlife. Refrain from playing loud music or using disruptive equipment.
v. Respect Cultural and Historical Site: Honor cultural and historical places such as the Kanheri Caves by adhering to guidelines. Avoid touching or damaging artifacts and monuments.
vi. Follow fire safety rules: Do not light fires or smoke in prohibited areas. Properly discard flammable materials to avoid accidental fires.
vii. Opt for environmentally friendly travel methods such as public transport and cycling to cut carbon emissions. Honor local communities, their cultures, traditions, and ownership rights.
viii. Designated Tourism Areas: Specific zones will be designated for tourists to avoid confusion, ensuring visitors stay within designated tourist areas.
ix. Plastic Use Reduction: Exhibits will be placed at key locations to raise awareness about the harmful impact of plastics on wildlife. A continued "No Plastic" campaign will be implemented, with support from NGOs and chaukidars to remove plastics from the ESZ area.
x. Vehicle Monitoring: Vehicle registration numbers will be noted upon entry. Walkie-talkies will be provided to guards to report offences, enabling real-time identification and fines for violators.
xi. Upgradation of Existing Infrastructure: All the existing facilities and infrastructure to be upgraded with the state-of-the-art equipment's to cater the demand of increasing visitors.

7.4 Specific Issues & recommendations specific to Tourist Locations in ESZ of SGNP

7.4.1 Film City Area

7.4.1.1 Overview

Mumbai's Film City, officially called **Dadasaheb Phalke Chitranagari**, is among India's largest and most renowned film studios. Situated in **Goregaon**, it covers

approximately **520 acres** and serves as a major center for Bollywood, television productions, and commercial shoots.

7.4.1.2 Issues

- Overcrowding & Management Issues: High Tourist Influx: Film City experiences a surge in visitors, particularly during peak seasons. Tourism vs. Filmmaking Conflict: The presence of tourists may interfere with ongoing film and TV productions.
- Infrastructure & Maintenance Challenges: Aging Facilities: Several sets and studios require renovation and modern upgrades. Traffic & Accessibility Issues: Situated in Goregaon, access to Film City is often hindered by Mumbai's heavy traffic.
- Environmental Concerns: Threat to Aarey Forest: Proximity to Aarey Colony makes the green cover vulnerable to tourism and development pressures. Waste Management Issues: Increased visitor and production activities contribute to waste generation, necessitating stricter disposal regulations.

7.4.1.3 Mitigation Measures

- Regulated & Structured Public Access: Designated Tourist Areas: Establish specific zones where visitors can explore film sets without interfering with productions. Pre-Scheduled Guided Tours: Introduce an online reservation system to control visitor flow and prevent overcrowding.
- Enhancing Infrastructure & Traffic Control: Eco-Friendly Shuttle Services: Deploy electric shuttle buses from nearby metro stations to ease traffic congestion. Improved Signage & Amenities: Install clear directional boards, rest areas, and essential visitor facilities for a better experience.
- Environmental Sustainability Measures: Sustainable Tourism Initiatives: Enforce strict waste management policies with designated disposal bins. Preserving Green Buffer Zones: Maintain dense tree cover to protect Aarey Forest from ecological degradation.

7.4.2 Chhota Kashmir Boat Club

7.4.2.1 Overview

Chhota Kashmir Boat Club, nestled in Aarey Colony, Goregaon, Mumbai, is a charming lakeside retreat often dubbed "**Little Kashmir**." Spread across roughly 4 acres, it features a tranquil water body offering paddle and rowing boat rides—complete with whimsical swan-shaped boats—set amid lush gardens, palm trees, and flowering lawns.

7.4.2.2 Issues

- Water Pollution and Waste Accumulation: Boating activity and visitor littering have led to pollution in the lake, including plastic waste, food wrappers, and decaying organic matter, affecting aquatic health.
- Disturbance to Biodiversity: Increased human footfall, noise from boating, and limited habitat space disrupt local bird species and butterflies, reducing the area's ecological richness.
- Encroachment and Urban Pressure: Being located within Aarey Colony—a region under constant urban development pressure—the surrounding green

cover and lake ecosystem face risks from unauthorized constructions and infrastructure expansion.

7.4.2.3 Mitigation Measures

- Pollution Control: Install waste bins and signage around the lake to encourage proper disposal. Conduct regular clean-up drives and enforce strict no-littering rules. Introduce eco-friendly boats to minimize oil and fuel leakage.
- Biodiversity Conservation: Designate certain areas as no-entry zones to protect bird nesting and butterfly habitats. Limit boating hours and reduce noise levels to minimize disturbance to wildlife.
- Regulation of Urban Impact: Enforce strict land-use zoning around the lake to prevent encroachment. Promote sustainable tourism practices and involve local stakeholders in conservation efforts to maintain ecological balance.

7.4.3 Upvan Lake

7.4.3.1 Overview

Upvan Lake is a prominent and scenic freshwater lake located at the foothills of Yeoor Hills in Thane, Maharashtra. Originally built in the 1880s by Thane Municipal Corporation for water supply, it now serves as a recreational and cultural hub. Surrounded by lush greenery and the Sanjay Gandhi National Park on one side, the lake offers a tranquil setting and supports local biodiversity, including migratory birds and aquatic species.

7.4.3.2 Issues

- Pollution and Waste Dumping: Discharge of untreated sewage, plastic waste, and religious offerings into the lake degrades water quality and harms aquatic life.
- Eutrophication: Excessive nutrient inflow from nearby residential areas leads to algal blooms, reducing oxygen levels and impacting biodiversity.
- Encroachment and Urban Pressure: Urban development around the lake has reduced green buffers and increased human activity, affecting the lake's natural ecology and its capacity for recharge.

7.4.3.3 Mitigation measures

- Environmental mitigation measures: Sustainable resource management, waste reduction and pollution control, eco-friendly infrastructure, carbon footprint reduction and controlled tourism activities are few mitigation measures to combat environmental issues.
- Community involvement and benefit sharing, cultural preservation and responsible tourism, fair wages and job security, regulated development and government policies and balance pricing and cost control are few mitigation measures for socio economic issues.

7.5 Summary and Conclusion

Sanjay Gandhi National Park and its Eco Sensitive Zone offers an array of unique and significant attractions, each drawing thousands of visitors annually. However,

with increasing footfall, these attractions face a variety of challenges, from environmental degradation to overcrowding. Through careful tourism planning, sustainable practices, and effective visitor management, it is possible to mitigate these issues and ensure that SGNP's attractions remain accessible and ecologically sustainable for future generations. Implementing measures such as controlled visitor flows, eco-friendly infrastructure, and improved visitor education will help preserve the park's natural and cultural heritage while enhancing the tourism experience.

8 ZONAL MASTER PLAN FOR ESZ

A Zonal Master Plan (ZMP) for an Eco-Sensitive Zone (ESZ) is a strategic document that guides sustainable development while ensuring ecological protection. It balances conservation, livelihood opportunities, and controlled development in areas surrounding protected ecosystems, such as national parks, wildlife sanctuaries, and biodiversity hotspots.

The Zonal Masterplan consists of zones which have been created along with a set of requirement, regulations, measures and mitigation strategies that have to be followed while undertaking any development within the Eco Sensitive Zone.

8.1 Objectives of Zonal Master Plan

The objectives of the Zonal Masterplan are as follows

- To protect the ecological integrity of the eco sensitive zone area.
- To regulate land use & development to minimize the adverse impact on the environment.
- To promote eco-friendly livelihood opportunities for local communities.
- To prevent proliferation of polluting industries and harmful activities in ESZ.
- To ensure compliance with environmental laws & guidelines.
- To identify, manage and conserve natural and manmade heritage in the ESZ
- To regulate mitigate impact of existing development plan on ESZ.
- To identify zones of ESZ based on biodiversity, carrying capacity, vulnerability and sustainability.

8.2 Challenges and Limitations in Zonal Master Plan

The Eco Sensitive Zonal masterplan for SGNP presents multiple challenges in zoning being a part of a bustling Metropolis, the financial capital of India, where the population & Development pressure is very high. Nevertheless, in order to protect the Sanjay Gandhi National Park, it is necessary to achieve a balance between environment, ecology and development. The challenges in the zoning are

a) Large scale development with varying intensity has already taken place in the Eco Sensitive Zones.
b) ESZ falls within the jurisdiction of multiple Urban local bodies, each facing development pressure to accommodate its human population
c) Development Plans under the MRTP Act 1966 for the Urban local bodies already exists, which also cover the area of ESZ
d) The ESZ also caters to important inter-regional Road and Railway Links like the Ghodbunder Road, National Highways, Virar Alibag Multi Modal Corridor, Mumbai Ahmedabad High Speed Rail, Dedicated Freight Corridor.
e) The ESZ also houses important and critical Water Reservoirs and Treatment Plants, Trunk Pipeline Network which treat and distribute potable water supply across ULB’s
f) The ESZ also forms an important link between the two fragmented blocks of SGNP to provide seamless connectivity for wildlife movement across the

blocks. The wildlife movement corridor further connects to the Tungareshwar National Park.

8.3 Zoning System

As the ESZ falls within areas where Development Plans have been published and sanctioned under the MRTP Act 1966, the need to create another similar zoning system does not arise. All land within ESZ is developed as per the Development Plans and Regional Plans sanctioned and published for each ULB and revised from time to time, subject to any conflict with the activities prohibited as per the ESZ Notification. The Zoning system intends to mitigate the impact of development based on the existing vulnerabilities while defining the activities under the ESZ Zones. A broad zoning system has been adopted which is based on the following factors

- Unique characteristic of the Eco Sensitive Zone
- Human Animal Conflict Zone
- Existing Developmental Pattern in light of Vulnerability
- Avoidance of any zoning nomenclature that is used in the Development Plan or Development Control & Promotion Regulation for land falling within ESZ

The Zonal Masterplan consists of the three zones – ESZ-1, ESZ-2 and ESZ-3 along with overlays of Immediate Impact Area of Human Animal Conflict and Area for Eco – Tourism Development Potential.

The zoning only applies for the area falling between SGNP 1996 Boundary and ESZ Boundary area but excluding SGNP Division Boundary area that falls in between them since SGNP Division Boundary area is part of Sanjay Gandhi National Park.

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8.4 Zoning for Eco-Sensitive Zone of Sanjay Gandhi National Park

The sections below list the activities allowed the respective zones, conditions (if any) for undertaking development within the respective zone.

8.4.1 Eco Sensitive Zone-1 (ESZ-1)

This zone includes existing and proposed areas like residential, commercial, public-semi-public, institutional, assembly, industrial, etc. which are built in conformity with the zones mentioned in the Development Plan and allowed development with full Development Potential. These zones are largely already developed. Hence, this zone will also be known as Settlement Zone. However, zones like No Development Zone, Restricted or limited Development Zones, Hill, Natural Areas, Natural Waters are not included in the ESZ-1.

All activities permitted in the respective Development Plan zones falling under ESZ -1, shall be permitted, unless specifically prohibited under this ESZ -1. Activities and projects which have been permitted by the ESZ monitoring committee and have been given environmental consent, till the date of publication, of the Zonal masterplan shall be permitted.

Since gaothan and padas are marked as ESZ-1, same shall be extended in case of gaothan or padas expansion in the future.

8.4.1.1 Prohibited Activities in ESZ-1

1. Commercial Mining, Stone Quarrying and Crushing Units: New and existing mining (minor and major minerals), stone quarrying and crushing units shall be prohibited except for the domestic needs of bona fide local residents with reference to digging of earth for construction or repair of houses and for manufacture of country tiles or bricks for housing for personal use.
2. Setting up of saw mills: No new or expansion of any existing saw mills shall be permitted.
3. Setting up of industries causing water or air or soil or noise pollution: No new or expansion of polluting industries in the ESZ-1 shall be permitted.
4. Establishment of hydroelectric projects and thermal power plants: Prohibited (except as otherwise provided) as per applicable laws.
5. Industries: Setting up of Industries causing water or air or soil or noise pollution including Industries related to Chemical production, pharmaceuticals, textiles and other obnoxious industries shall be strictly prohibited. Use or production of any hazardous substances is prohibited.
6. Use or production of any hazardous substances: Prohibited (except as otherwise provided) as per applicable laws.
7. Discharge of untreated effluents and solid waste in natural water bodies or land area: Prohibited (except as otherwise provided) as per applicable laws.
8. New wood-based industry: Establishment of new wood-based industry shall not be permitted. The existing wood-based industries may continue unless prohibited under any law for the time being force.

9. New encroachments and their regularization: Encroachments of all kinds shall be prohibited. Existing encroachments shall be rehabilitated on priority.
10. Lease out of submergence areas by irrigation department: Total ban on lease for farming, fishing or any other activity in the submergence area, not related to the stated purpose (water supply & ancillary works thereto) of the lakes and tanks.

8.4.1.2 Regulated Activities in ESZ-1

1. Activities permitted - Construction shall be permitted within the Eco-Sensitive Zone as per the provisions of the approved Development Plan and other applicable rules and regulation under the Maharashtra Regional and Town Planning Act 1966. Provided further that the commercial redevelopment, reconstruction, repairs of existing structures which includes group housing societies, sanctioned by concerned Local Self Government under approved Development Plan under the Maharashtra Regional and Town Planning Act, shall be allowed. Following is the list of activities permitted in ESZ-1:
    a. Residential activities such as residential buildings, townships, public housing, individual bungalows and student hostels to the extent permitted in the applicable Development Plan.
    b. Commercial activities such as retail, informal shop, markets, offices, banks, wholesale and general business are permitted to the extent permitted in the applicable Development Plan.
    c. Lodges, Boarding Houses, serviced apartments, nature wellness Centres, Retreats, ecofriendly tourist villages and retreats & Eco-Friendly cottages shall be permitted to the extent permitted in the applicable Development Plan.
    d. Restaurants, Eating Houses, Dining Room, Canteens, Eateries shall be permitted to the extent permitted in the applicable Development Plan.
    e. Educational services like schools, colleges, university, vocational institute/ITI, Anganwadi, Training institute and Healthcare services like Govt. Hospital/Municipal Hospital, Private Hospital, Diagnostics centre, Clinic/Dispensary, Nursing home, PHC, CHC and UHC governed by ULB/Govt as well as veterinary hospital/clinic are permitted in this zone to the extent permitted in the applicable Development Plan.
    f. Public Semi-public activities such as police station & Chowkies, guesthouse, community hall, Dharamshala, museum, public library, art gallery & cultural centre, public/community toilet, social welfare centre, old age home, fire station are permitted in this zone to the extent permitted in the applicable Development Plan.
    g. Religious places such as temples, mosque, church, idgah, gurudwara, monastery, synagogue, chhatri, agiary and others are permitted in this zone to the extent permitted in the applicable Development Plan.
    h. Recreational activities related to eco-tourism, garden, park, playground, club, sports centre, gymnasium, swimming pool, aquarium, planetarium, are permitted in this zone the extent permitted in the applicable Development Plan.

i. Public utilities, Civic Amenities and public infrastructure such as water treatment plant, water pumping station, ground level reservoir, sewage treatment plant, sewage pumping station, electric power plant, electric substation, Roads, Tunnels, Bridges, Metro Car Shed, Metro Depots are permitted in this zone. Any public infrastructure activities that is necessary for the city and public at large and which served public purpose shall be permitted in this zone to the extent permissible in the applicable Development Plan. The construction activities of water supply infrastructure facilities of Municipal Corporation/Council related to maintenance, rehabilitation and augmentation are permitted. Widening and strengthening of existing roads, bridges, infrastructure and construction of new roads is permitted as per applicable Rules and regulations. Use of Eco - friendly Materials is promoted in construction activities. Use and dumping of hazardous materials in construction is prohibited.
j. Movement of vehicular traffic at night: Shall be regulated for commercial purpose under applicable laws.
k. Erection of electrical cables and telecommunication towers: Shall be regulated as per applicable laws. Construction/augmentation and renovation of power transmission lines and cables, telecommunication towers and cable shall be permitted. New underground cabling shall be promoted.
l. Agricultural lands such as cropland, fallow/barren/pad land, plantation, orchards, plant nursery are permitted the extent permitted in the applicable Development Plan. Agriculture, floriculture, horticulture or agro-based industry producing products from indigenous goods from the Eco- Sensitive Zone, and which do not cause any adverse impact on environment shall be permitted. Introduction of exotic species shall be regulated as per applicable laws.
m. Commercial Sign boards and hoardings shall be permitted, however no illuminated or LED Hoarding shall be allowed facing Sanjay Gandhi National Park boundary.
n. Any other activities which are non-polluting, non-hazardous may be allowed if permitted by the applicable Development Plan and regulations subject to approval of commissioner of the respective Local body and the ESZ monitoring committee.

2. Activities permitted with preparation and submission of Environmental Management Plan - The following activities shall be permitted, subject to implementation of Environmental measures suggested in the Environmental Management Plan to be approved by the ESZ monitoring committee. The Project proponent shall prepare an Environmental management plan which shall study the lifecycle Environmental Impact (Air, Land, Water, Sound etc) and recommend measures to be implemented to mitigate such impact. The ESZ Monitoring committee shall evaluate and approve the Environmental Management Plan and the mitigation measures to be adopted for the project.

The Occupation Certificate by the ULB shall be given only on audit and compliance of the mitigation measures recommended in the Environmental Management Plan.

a. Commercial activities such as shopping malls, Multiplex/Cinema, shopping Centres, Function Hall, Marriage Halls, Auditoriums, Theatres, Convention Centres, Petrol pump/LPG filling are permitted subject to the environmental mitigation measures suggested in the Environmental Management Plan to be prepared by the project proponent while submitting the proposal. The Commencement Certificate by the ULB shall be given only on audit of the mitigation measures implemented.
b. Industrial activities such as Non-Hazardous Small-scale industry not causing pollution, manufacturing industry not causing pollution, service industries, IT Parks, Agro - Based industry, Warehouses and Storage Godowns are permitted in this zone subject to the environmental mitigation measures suggested in the Environmental Management Plan to be prepared by the project proponent while submitting the proposal. The Commencement Certificate by the ULB shall be given only on audit of the mitigation measures implemented.

3. Cultural & Educational Activities
    a. Preservation of historical, religious, or tribal sites
    b. Educational programs & environmental awareness campaigns
    c. Research & archaeological excavations (with proper permits)
4. Sustainable Agriculture & Livelihood Activities
    a. Organic farming & permaculture with minimal environmental impact
    b. Traditional handicrafts & sustainable local industries
    c. Beekeeping, herbal plantations, & medicinal plant cultivation
5. Other Measures to be followed within the ESZ - 1
    a. No Felling of trees: There shall be no felling of trees on the forest or Government or revenue or private lands without prior permission of the competent authority in the State Government. The felling of trees shall be regulated in accordance with the provisions of the concerned Central or State Act and the rules made thereunder.
    b. Protection of hill slopes and river banks: Shall Regulated as per applicable laws.
    c. Discharge of treated effluents in natural water bodies or land area.: Recycling of treated effluent shall be encouraged and for disposal of sludge or solid wastes shall be in accordance with the applicable regulations.
    d. Collection of Forest produce or Non-Timber Forest Produce (NTFP): No collection centre shall be permitted within hundred metres from the boundary of Wild Life Sanctuary or National Park
    e. Air and vehicular pollution: Regulated as per applicable laws.
    f. Use of polythene bags by shopkeepers: Regulated as per applicable laws.

g. Drastic Change of Agriculture systems.: Regulated as per applicable laws.
h. Commercial use of firewood.: Regulated (except as otherwise provided) as per applicable laws.
i. Undertaking activities related to tourism such as over-flying the National Park Area by aircraft, hot-air balloons, drones, etc.: Regulated (except as otherwise provided) as per applicable laws.
j. Solid Waste Management.: Regulated (except as otherwise provided) as per applicable laws.

8.4.1.3 Promoted activities in ESZ-1:

1. Ongoing agriculture and horticulture practices by local communities along with dairies, dairy farming, aquaculture and fisheries
2. Rain water harvesting shall be compulsorily be promoted in all projects.
3. Organic farming as sustainable livelihood practice that supports ecological balance, reduces chemical impact on biodiversity, and empowers local communities through eco-friendly agriculture shall be promoted.
4. Adoption of green technology for all activities that are carried out shall be promoted.
5. Cottage industries including village industries, convenience stores, local amenities, public utility and community buildings shall be promoted.
6. Use of renewable energy sources: The use of renewable energy sources, such as solar, wind, and hydropower shall be promoted since it helps reduce carbon emissions, promotes sustainability, and decreases dependency on fossil fuels.
7. Agro – Forestry shall be promoted since it will only help to enhance the biodiversity along with improving soil health, and increase crop yield.
8. Skill Development shall be promoted in order to empower local communities in sustainable practices and maintaining the balance.
9. Environment Awareness: involves educating local communities and visitors about the importance of preserving biodiversity, reducing human impact, and promoting sustainable practices to protect fragile ecosystems and maintain ecological balance within the ESZ.
10. Eco Tourism Activities as per applicable regulations where the areas have been zoned for Eco Tourism Development Potential under Sub Section 4
11. Location of open spaces within the Eco Sensitive Zone where plot falls partly within the Eco Sensitive Zone.

8.4.2 Eco Sensitive Zone-2 (ESZ-2)

Areas which are not developed and zoned as No Development Zone, Restricted or limited Development Zones, Hill, Tree clad, Natural Areas, etc as per the existing Development plans and are vulnerable from environmental point of view, and where development needs to be regulated is categorised as ESZ -2 or Regulated Development Zone.

All activities permitted in the respective Development Plan zones falling under ESZ -1, shall be permitted, unless specifically prohibited under this ESZ -2.

8.4.2.1 Prohibited Activities in ESZ-2:

1. Activities prohibited: In addition to activities prohibited in ESZ 1, the following activities shall be additionally prohibited
    a. Large scale shopping malls, Shopping Complexes, Retail Complexes, Commercial offices, IT Parks are prohibited up to a distance of 1 Km from the National Park boundary or upto the ESZ boundary whichever is lesser.
    b. Activities such as auditorium, town hall, drama theatre, convention centre are prohibited up to a distance of 1 Km from the National Park boundary or upto the ESZ boundary whichever is lesser.
    c. Industries related to small scale industry, manufacturing, chemical production, pharmaceuticals, textiles and other obnoxious industries are prohibited.
2. Land Use & Construction Restrictions
    a. Deforestation & Land Clearing – Cutting down trees, clearing vegetation, or converting forest land for agriculture or settlements.
    b. Urbanization & Infrastructure Expansion – Unregulated housing projects, encroachments and their regularization, roads, and industrial parks except permitted under the respective development plan.
    c. Commercial Mining, Blasting, Stone Quarrying and Crushing Units – Extraction of minerals, rocks, or sand that leads to habitat destruction.
3. Environmental & Wildlife Protection
    a. Encroachment & Illegal Settlements – Unauthorized human habitation or farming.
    b. Introduction of Invasive and exotic Species – Planting non-native species that disrupt local ecosystems is prohibited.
    c. Dumping of Waste & Hazardous Materials – Industrial, chemical, or plastic waste pollution is prohibited.
    d. Water Pollution – Dumping untreated sewage, industrial runoff, or chemicals into rivers, lakes, or wetlands is prohibited.
    e. Lease out of submergence areas as designated/notified by irrigation department is strictly prohibited in this zone.
    f. Collecting eggs, feathers, or any other wildlife products is prohibited.
    g. Disturbance to Wildlife - Playing loud music, honking, or using high-beam lights at night is strictly prohibited.
    h. Flash photography near animals is not allowed.
4. Commercial & Industrial Activities
    a. Timber Extraction & Commercial Logging – Unauthorized cutting of trees for profit. Setting up of saw mills shall be prohibited in this zone.
    b. No new wood-based industry shall be set up in this zone.
    c. Mining & Extraction Industries which Includes coal, limestone, sand, and gravel mining. shall be strictly prohibited.
    d. Oil & Gas Exploration – Drilling or extraction of fossil fuels shall not be allowed since it compromise with the soil.
    e. Heavy and Polluting Industries –Setting up of Industries causing water or air or soil or noise pollution shall be strictly prohibited.

f. Unregulated Tourism – Mass intensive tourism activities except those permitted above, unauthorized off-road vehicle tours, and excessive foot traffic. Tourism carrying capacity to be calculated for each of the tourist spots by the competent authority.

5. Agricultural & Livelihood Restrictions
    a. Large-Scale Commercial Agriculture – Expanding farms for cash crops (e.g., palm oil, soy, sugarcane) that lead to deforestation.
    b. Pesticide & Chemical Use – Spraying harmful agrochemicals that contaminate soil and water.
    c. Overgrazing & Livestock Farming – Excessive grazing that leads to soil erosion.
6. Infrastructure & Energy Development
    a. Dams, Hydroelectric Projects and Thermal Power plants – Large-scale dams that flood ecosystems and displace wildlife shall be prohibited. Hydroelectric projects and thermal power plants are prohibited in this zone.
    b. Highways & Railways – Major transportation projects that fragment habitats are prohibited (To be permitted only after Environmental Management Plan and Wildlife Mitigation Plan approved and mitigation measures implemented as part of project).
    c. Unregulated Power Plants – Such as Coal, nuclear, or large-scale renewable projects that impact biodiversity shall be prohibited.
7. Tourism & Human Activity Restrictions
    a. Illegal Settlements & Encroachment – Construction of unauthorized homes or businesses.
    b. Unregulated Tourism – Disrupting wildlife with noise, littering, or disturbing nesting grounds. Exceeding the carrying capacity of eco-sensitive zones shall be strictly avoided.
    c. Use of Fireworks & Open Fires which leads to High risk of forest fires shall be prohibited.
    d. Loud Noise & Disturbances – Activities like music festivals, construction noise, and loudspeakers shall be prohibited.
    e. Visitors must adhere to entry time restrictions and designated trekking routes.
    f. Littering and Plastic Waste - Carrying single-use plastic is banned.
    g. Unauthorized Camping and Bonfires - Open fires can cause forest fires and harm wildlife.
    h. Camping is only allowed in designated eco-lodges or authorized campsites.
    i. Non-Eco-Friendly Transport shall be discouraged and only electric or non-motorized transport (bicycles, trekking) shall be encouraged.
8. Cultural & Ethical Guidelines-
    a. Disrespecting Local Traditions and Indigenous Communities - Tourists must respect local cultures and traditions.
    b. Drugs use is strictly prohibited.
    c. Smoking is restricted due to the risk of forest fires.

8.4.2.2 Regulated activities in ESZ-2:

1. Activities permitted: Reconstruction, Repairs of existing structures which includes structure in existing Gaothan, padas & villages, group housing societies, sanctioned by concerned Local Self Government under approved Development Plan under the Maharashtra Regional and Town Planning Act, shall be allowed.
2. Activities permitted with preparation and submission of Environmental Management Plan: The Project proponent shall prepare an Environmental management plan which shall study the lifecycle Environmental Impact (Air, Land, Water, Sound etc) and recommend measures to be implemented to mitigate such impact. The ESZ Monitoring committee shall evaluate and approve the Environmental Management Plan and the mitigation measures to be adopted for the project. The Occupation Certificate by the ULB shall be given only on audit and compliance of the mitigation measures recommended in the Environmental Management Plan. The following activities shall be permitted, subject to implementation of Environmental measures suggested in the Environmental Management Plan to be approved by the ESZ monitoring committee.
    a. Residential activities such as residential buildings, townships, public housing, individual bungalows and hostels to the extent permitted in the applicable Development Plan.
    b. Convenience Commercial activities such as retail, informal shop, markets, offices, banks, wholesale and general business are permitted to the extent permitted as in the applicable Development Plan as a part of mixed-use development.
    c. Lodges, Boarding Houses, service apartments, nature wellness Centres, Retreats, eco-friendly tourist villages and retreats & Eco-Friendly cottages shall be permitted to the extent permitted in the applicable Development Plan
    d. Restaurants, Eating Houses, Dining Room, Canteens, Eateries shall be permitted to the extent permitted in the applicable Development Plan.
    e. Educational services like schools, colleges, university, vocational institute/ITI, Anganwadi, Training institute.
    f. Healthcare services like Govt. Hospital/Municipal Hospital, Private Hospital, Diagnostics centre, Clinic/Dispensary, Nursing home, PHC, CHC and UHC governed by ULB/Govt as well as veterinary hospital/clinic are permitted in this zone to the extent permitted in the applicable Development Plan.
    g. Public Semi-public activities such as police station & Chowkies, guesthouse, community hall, Dharamshala, museum, public library, art gallery & cultural centre, public/community toilet, social welfare centre, old age home, fire station is permitted in this zone to the extent permitted in the applicable Development Plan.
    h. Religious places such as temples, mosque, church, idgah, gurudwara, monastery, synagogue, chhatri, agiary and others are permitted in this zone to the extent permitted in the applicable Development Plan.

i. Recreational activities related to eco-tourism, garden, park, playground, club, sports centre, gymnasium, swimming pool, aquarium, planetarium, are permitted in this zone the extent permitted in the applicable Development Plan.
j. Public utilities, Civic Amenities and public infrastructure such as water treatment plant, water pumping station, ground level reservoir, sewage treatment plant, sewage pumping station, electric power plant, electric substation, Roads, Tunnels, Bridges, Metro Car Shed, Metro Depots are permitted in this zone. Any public infrastructure activities that is necessary for the city and public at large and which served public purpose shall be permitted in this zone to the extent permissible in the applicable Development Plan. The construction activities of water supply infrastructure facilities of Municipal Corporation/Council related to maintenance, rehabilitation and augmentation are permitted. Widening and strengthening of existing roads, bridges, infrastructure and construction of new roads is permitted as per applicable Rules and regulations. Use of Eco - friendly Materials is promoted in construction activities. Use and dumping of hazardous materials in construction is prohibited.
k. Movement of vehicular traffic at night: Shall be regulated for commercial purpose under applicable laws
l. Erection of electrical cables and telecommunication towers: Shall be regulated as per applicable laws. Construction/augmentation and renovation of power transmission lines and cables, telecommunication towers and cable are permitted. New underground cabling is promoted
m. Agricultural lands such as cropland, fallow/barren/pad land, plantation, orchards, plant nursery are permitted the extent permitted in the applicable Development Plan. Agriculture, floriculture, horticulture or agro-based industry producing products from indigenous goods from the Eco- Sensitive Zone, and which do not cause any adverse impact on environment shall be permitted. Introduction of exotic species shall be regulated as per applicable laws.
n. Commercial Sign boards and hoardings shall be permitted, however no illuminated or LED Hoarding shall be allowed facing SGNP upto 50 meters of the National Park boundary and post 50 meters the LED hoardings shall be permitted in accordance of the Development Control Rules and, in any case, shall not face towards SGNP.
o. Any other activities which are non-polluting, non-hazardous may be allowed if permitted by the applicable Development Plan and regulations subject to approval of commissioner of the respective Local body and the ESZ monitoring committee.

3. Infrastructure & Utility Development
    a. Water conservation projects such as check dams.
    b. Renewable energy projects (solar farms, wind energy projects)
    c. Essential infrastructure and Utilities (Roads, bridges, telecommunication towers, Water Supply and Management Project)

4. Cultural & Educational Activities
    d. Preservation of historical, religious, or tribal sites
    e. Educational programs & environmental awareness campaigns
    f. Research & archaeological excavations (with proper permits)
5. Sustainable Agriculture & Livelihood Activities
    d. Organic farming & permaculture with minimal environmental impact
    e. Traditional handicrafts & sustainable local industries
    f. Beekeeping, herbal plantations, & medicinal plant cultivation
6. Eco Tourism Activities
    a. Guided Nature walks and wildlife watching trails.
    b. Bird watching and non-invasive wildlife observations.
    c. Cultural and interpretative programs involving community led activities such as traditional crafts, storytelling and interpretative talks.
    d. Nature photography and environmental education.
    e. Low impact camping
7. Other Measures to be followed within the ESZ - 2
    k. No Felling of trees: There shall be no felling of trees on the forest or Government or revenue or private lands without prior permission of the competent authority in the State Government. The felling of trees shall be regulated in accordance with the provisions of the concerned Central or State Act and the rules made thereunder.
    l. Protection of hill slopes and river banks: Shall Regulated as per applicable laws.
    m. Discharge of treated effluents in natural water bodies or land area.: Recycling of treated effluent shall be encouraged and for disposal of sludge or solid wastes shall be in accordance with the applicable regulations.
    n. Collection of Forest produce or Non-Timber Forest Produce (NTFP): No collection centre shall be permitted within hundred metres from the boundary of Wild Life Sanctuary or National Park
    o. Air and vehicular pollution: Regulated as per applicable laws.
    p. Use of polythene bags by shopkeepers: Regulated as per applicable laws.
    q. Drastic Change of Agriculture systems.: Regulated as per applicable laws.
    r. Commercial use of firewood.: Regulated (except as otherwise provided) as per applicable laws.
    s. Undertaking activities related to tourism such as over-flying the National Park Area by aircraft, hot-air balloons, drones, etc.: Regulated (except as otherwise provided) as per applicable laws.
    t. Solid Waste Management.: Regulated (except as otherwise provided) as per applicable laws.

8.4.2.3 Promoted activities in ESZ-2:

1. Ongoing agriculture and horticulture practices by local communities along with dairies, dairy farming, aquaculture and fisheries

2. Rain water harvesting shall be compulsorily be promoted in all projects.
3. Organic farming as sustainable livelihood practice that supports ecological balance, reduces chemical impact on biodiversity, and empowers local communities through eco-friendly agriculture shall be promoted.
4. Adoption of green technology for all activities that are carried out shall be promoted.
5. Cottage industries including village industries, convenience stores, local amenities, public utility and community buildings shall be promoted.
6. Use of renewable energy sources: The use of renewable energy sources, such as solar, wind, and hydropower shall be promoted since it helps reduce carbon emissions, promotes sustainability, and decreases dependency on fossil fuels.
7. Agro – Forestry shall be promoted since it will only help to enhance the biodiversity along with improving soil health, and increase crop yield.
8. Skill Development shall be promoted in order to empower local communities in sustainable practices and maintaining the balance.
9. Environment Awareness: involves educating local communities and visitors about the importance of preserving biodiversity, reducing human impact, and promoting sustainable practices to protect fragile ecosystems and maintain ecological balance within the ESZ.
10. Eco Tourism Activities as per applicable regulations where the areas have been zoned for Eco Tourism Development Potential under Sub Section 4
11. Location of open spaces within the Eco Sensitive Zone where plot falls partly within the Eco Sensitive Zone.

8.4.3 Eco Sensitive Zone-3 (ESZ-3)

Eco Sensitive Zone have been marked where presence of environmental rich features are found whose preservation is of utmost importance from ecological point of view. For example, area under mangroves, Tree Clad hill areas etc. This zone includes the ecological fragile areas, areas under CRZ-1 as well as 50-meter buffer area which has to be maintained. They often protect shorelines, prevent erosion, support biodiversity, sequester carbon, and provide habitat for marine life and migratory birds

8.4.3.1 Prohibited activities in ESZ-3

1. All activities permitted and prohibited in ESZ 1, ESZ 2 shall remain prohibited in this Zone
2. No development or construction activities of whatsoever nature will be allowed in this zone, except as mentioned below under regulated activities.
3. Land reclamation and agriculture or aquaculture is strictly prohibited.

8.4.3.2 Regulated activities in ESZ-3

1. Activities such as related to tribal people, forest and forest allied uses.
2. Forest Department Protection infrastructure and tourism infrastructure from education point of view only with prior approval of Eco Tourism.
3. Development of animal corridors to facilitate movement of animals across.
4. Trunk city or Region level infrastructure only on state directives which are beneficial for the city, subject to applicable regulations. Environmental

Management Plan and wildlife mitigation plan will be compulsory for any such infrastructure development.

Note: Notwithstanding Regulations contained in 8.4.1, 8.4.2 & 8.4.3, the uses as specified in Draft Regulation 34(3.5) (ix) of DCPR 2034, for Provision of Rehabilitation of Adivasi Families and eligible Encroachers situated in the Sanjay Gandhi National Park, published by UDD on 30/06/2025 shall be permissible anywhere in ESZ.

8.5 Immediate Impact Area - Human Animal Conflict

Human-animal conflict refers to direct interactions between wildlife and humans that result in negative outcomes, including damage to property, loss of life, and threats to biodiversity. This conflict is especially common in buffer zones and areas surrounding protected forests, national parks, and wildlife sanctuaries. Human animal conflict occurs when human activities and wildlife habitats overlap, leading to negative interactions such as crop damage, livestock predation, human injuries, and retaliatory killings of animals. This is a growing concern near SGNP forest areas due to habitat loss and fragmentation of wildlife and increasing human encroachments.

8.5.1 Causes of Human-Animal Conflict

i. Deforestation & land conversion for agriculture, settlements, and infrastructure.
ii. Urbanization near protected areas reduces natural wildlife corridors.
iii. Livestock grazing in forests leads to competition for resources and attracts predators.
iv. Tourism & human intrusion disturb natural wildlife patterns.
v. Drought & water scarcity force animals to enter human-dominated areas.
vi. Highways, railway tracks, and dams disrupt natural migration routes.
vii. Electric fences & trenches can injure or trap animals.
viii. Protected areas & conservation success led to increased wildlife numbers further leading to increasing competition amongst wildlife and movement outside forest in search of easy prey.

8.5.2 Human-Animal Conflict as a basis for zoning

Human-animal conflict is a critical factor in designing zoning regulations for an Eco-Sensitive Zone (ESZ). Effective zoning based on conflict intensity can help in reducing negative interactions, ensuring wildlife conservation and promoting sustainable human activities.

A buffer of 250m around each of previously observed Human animal conflict's location from 2012 onwards is taken as a zone which shall be regulated with mitigation measures in order to avoid future such instances considering Urban ESZ. However, it is to be noted that buffer around individual conflict locations are not included in the Immediate Impact Area and only at places where multiple instances of human animal conflicts have happened is zoned under Immidiate Impact Area. (Assessment of socio psychological perspectives and actual threat from Leopard in Motichur Range, Dec 2019).

Alongwith human animal conflict locations, animal corridors are also marked across SGNP-TWLS on Chinchoti Anjur Phata Road, across Diva-Vasai Railway Track, Ghodbunder Road and Vasai Creek/Ulhas River and a buffer of 250m is proposed around it as immediate impact area.

8.5.3 Human Animal Conflict Zones

These are zones where Human animal conflict has been recorded in the past. It will be regulated in order to mitigate any future instances of human-animal conflicts. Wherever the Human Animal Conflict overlay is indicated, the following mitigation measures shall apply in addition to the requirements under ESZ 1 or 2 or 3 in which a plot may fall. Immediate Impact Area shall only be applicable for plots that falling within the Eco Sensitive Area and not beyond. Activities shall be permitted, regulated or prohibited as per respective zones; however, the following mitigation measures shall be adopted.

8.5.3.1 Mitigation measures to avoid human-animal conflicts in zones

1. Adherence to Zonal Master Plan and ESZ Notification: Ensure that any proposed construction shall align with the zonal master plan of the ESZ, which outlines permissible, regulated, and prohibited activities for each zone
2. Wildlife Mitigation Plan/Conflict Mitigation Plan shall be prepared by all project proponents for developments that are undertaken within zones affected by Human animal conflicts. Such Plans shall be approved by the Eco Sensitive Zone monitoring committee in consultation with Director, SGNP before the permissions for the project is given and the occupancy and/or completion certificate shall only be given after the audit and compliance of implementation of Mitigation measures is certified.
3. Use of Wildlife-Friendly Infrastructure: Incorporate designs that minimize barriers to wildlife movement, such as animal corridors wherever necessary.
4. Community Engagement: Involve local communities in planning and decision-making processes to ensure that development meets both human needs and wildlife conservation goals.
5. Strict prohibition on Encroachment: Prevent human encroachment into forests, wetlands, and other sensitive habitats in the ESZ area.
6. Boundaries, Fencing & Trenches: Install appropriate fencing, high boundaries and trenches of appropriate depths around agricultural lands and settlements to deter animals. It must however be ensured that no animals are harmed by the fencing/boundary/trenches.
7. Bio-Fencing: Use thorny plants, bamboo and beehive fences to discourage animal movement into human settlements.
8. Early Warning Systems: Install motion-sensor alarms, trip wires, and surveillance cameras to alert communities of approaching wildlife.
9. Avoid open garbage dumping, use secured livestock enclosures, and avoid venturing alone at night.

8.6 Area for Potential Eco Tourism Development

The National Park, forest, Hills, waterbodies and natural areas have inherent tourism potential, which can boost local economy. Areas within ESZ has been identified for Development of Eco tourism on the principles of symbiotic and balanced development to provide employment opportunities to local people.

In Addition to the development permitted under the respective Eco Sensitive Zone under which the plot may fall, the following additional activities shall be permissible,

subject to the Environmental Management Plan to be submitted and mitigation measures be implemented.

All new tourism activities or expansion of existing tourism activities within the Eco-sensitive Zone shall be in accordance with the guidelines issued by the Central Government in the Ministry of Environment, Forest and Climate Change and the eco-tourism guidelines issued by National Tiger Conservation Authority, (as amended from time to time) with emphasis on eco-tourism, eco-education and eco-development and based on carrying capacity study of the Eco- sensitive Zone.

Considering the eco-tourism development potential in line with the upcoming river front development along Chene river, the location in Chene village is marked with this area. Also, a major part of Yeeor is included in this zone since it is a forested escape in urban jungle with ideal for picnic, camping, cycling and other tourism related activities.

8.6.1.1 Promoted activities

Activities Promoted: The following activities shall be permitted, subject to implementation of Environmental measures suggested in the Environmental Management Plan to be approved by the ESZ monitoring committee. The Project proponent shall prepare an Environmental management plan which shall study the lifecycle Environmental Impact (Air, Land, Water, Sound etc) and recommend measures to be implemented to mitigate such impact. The ESZ Monitoring committee shall evaluate and approve the Environmental Management Plan and the mitigation measures to be adopted for the project. The Occupation Certificate by the ULB shall be given only on audit and compliance of the mitigation measures recommended in the Environmental Management Plan.

1. Sustainable and Eco-Friendly Villages & Retreats, Eco Lodges, Nature Wellness Centres, Home stays, cottages, Log huts, community-based tourism sites subject to use of approved green building materials. Green building material shall mean material that prioritize sustainability throughout their lifecycle, minimizing environmental impact during production, construction, operation, and end-of-life. These materials are renewable, recyclable, or made from recycled content, and can also be locally sourced to reduce transportation emissions.
2. Nature based activities like nature walks with regulated routes and guides, bird watching and photography, trekking and hiking on designated trails with minimal impact, camping and eco-lodging in sustainable accommodation like eco-resorts and treehouses, Outdoor and indoor gaming activities, boating with non-motorized or electric boats in water bodies, visits to historical sites with preservation measures.
3. Sustainable infrastructure and facilities like eco-lodges, Retreats and homestays built using eco-friendly materials, nature interpretation centres, community-based tourism, renewable energy use.
4. Scientific Research and Conservation with prior approvals, workshops, training and nature camps, plantation drives and conservation initiatives.

5. Medical Rehabilitation Centres, Naturopathy Centres, Sanitoriums, Medical Research Centres, Ayurvedic villages, Wellness centres and Retreats for medical recuperation which require a cleaner environment.
6. Any other activities of sustainable tourism, Eco friendly tourism which are non-polluting, non-hazardous may be allowed if permitted by the applicable Development Plan and regulations subject to approval of commissioner of the respective Local body and the ESZ monitoring committee.

8.7 Applicabilty of Zonal Master Plan

Activities and projects which have been permitted and approved by the ESZ monitoring committee and SBWL and have been given environmental consent, till the date of publication, of the Zonal masterplan shall be permitted without complying with the Zonal Masterplan.

8.8 Distribution of areas under different zones

Table 8.1 Village wise area distribution in different zones in BMC[9]

Village Name	ESZ-1 (Ha)	ESZ-2 (Ha)	Waterbodies (Ha)	SGNP Division Forest (Ha)
Aarey	0.000	308.161	11.087	185.196
Akurli	2.849	26.043	2.006	117.162
Bhandup-w	0.000	18.945	0.000	0.000
Dahisar	14.133	24.930	2.447	86.988
Dindoshi	0.000	26.375	0.001	0.000
Eksar-n	0.725	0.000	0.038	0.000
Goregaon	0.000	270.967	2.496	0.000
Gundhgaon	0.000	271.721	35.765	0.005
Kanheri	12.200	2.208	3.144	12.028
Kanjur-w	0.179	15.046	0.000	0.000
Klerabad	0.000	171.450	319.285	0.000
Kurar	4.289	0.000	0.246	0.000
Magathane	16.114	3.138	14.607	540.988
Majas	0.000	3.460	0.000	0.001
Malad-e	40.542	53.884	0.429	0.045
Marol maroshi	36.353	156.680	2.506	150.798
Mulund-w	14.125	4.380	0.024	0.342
Nahur	11.235	4.787	0.048	0.004
Pahadi goregaown	0.000	61.562	2.471	0.014
Paspoli	0.000	85.448	3.350	0.123
Poisar	11.393	6.077	0.511	117.759

[9] Please note that around 11.642 Ha of ESZ-1 Zone in Marol Maroshi Village overlaps with the SGNP Division Forest

Village Name	ESZ-1 (Ha)	ESZ-2 (Ha)	Waterbodies (Ha)	SGNP Division Forest (Ha)
Prajapur	0.072	47.419	1.165	0.265
Saai	0.000	83.017	106.459	0.011
Vyaravli	0.000	15.753	0.028	0.000
Grand Total	**164.209**	**1661.451**	**508.113**	**1211.729**

Source: Consultant Analysis

Table 8.2 Ward wise area distribution in different zones in BMC

Ward	ESZ-1 (Ha)	ESZ-2 (Ha)	Waterbodies (Ha)	SGNP Division Forest (Ha)
K/E	0.001	68.420	1.193	0.284
P/N	44.835	117.502	1.366	0.088
P/S	36.422	781.456	18.267	319.766
R/C	38.476	7.218	18.095	573.137
R/N	4.835	23.183	2.181	85.850
R/S	14.112	20.081	2.374	232.216
S	0.179	117.515	3.346	0.028
T	25.349	526.077	461.291	0.363
Grand Total	**164.209**	**1661.451**	**508.113**	**1211.729**

Source: Consultant Analysis

Table 8.3 Village wise area distribution in different zones in MBMC[10]

Village Name	ESZ-1 (Ha)	ESZ-2 (Ha)	ESZ-3 (Ha)	Area for Eco Tourism (Ha)	Waterbodies (Ha)	SGNP Division Forest (Ha)
Chenne	0.000	113.684	35.077	69.081	10.933	25.406
Ghodbunder	11.857	23.709	0.000	0.000	0.037	0.176
Kashi	2.092	31.769	0.000	0.000	1.412	0.000
Mire	18.684	9.209	0.000	0.000	0.318	0.027
Versave	4.520	63.386	27.873	0.000	2.603	106.957
Grand Total	**37.153**	**241.757**	**62.950**	**69.081**	**15.303**	**132.566**

Source: Consultant Analysis

Table 8.4 Village wise area distribution in different zones in TMC

Village Name	ESZ-1 (Ha)	ESZ-2 (Ha)	ESZ-3 (Ha)	Area for Eco Tourism (Ha)	Waterbodies (Ha)	SGNP Division Forest (Ha)
Bhaindar pada	0.000	53.728	6.131	0.000	18.717	453.714
Boriwade	10.272	5.348	0.00	0.000	1.407	131.942
Chitalsar manpada	30.146	7.490	0.00	0.000	0.922	65.898
Kavesar	27.799	14.312	0.00	0.000	0.198	0.045
Kolshet	8.966	4.408	0.00	0.000	0.130	0.936

[10] Around 25.799 Ha of Zoning is proposed inside SGNP Division Forest since it is zoned as ESZ-3.

Majiwade	58.575	23.985	0.00	0.000	1.529	0.029
Owala	4.371	31.062	0.00	0.000	0.168	2.347
Pachpakhadi	38.803	5.918	0.00	0.000	0.295	0.092
Wadwali	2.200	1.255	0.00	0.000	0.000	0.000
Yeoor	3.516	211.066	0.00	188.034	3.275	5.525
Grand Total	**184.648**	**358.573**	**6.131**	**188.034**	**26.641**	**660.528**

Source: Consultant Analysis

Table 8.5 Village wise area distribution in different zones in VVCMC

Village Name	ESZ-2 (Ha)	ESZ-3 (Ha)	Waterbodies (Ha)	SGNP Division Forest (Ha)
Bapane	0.000	0.505	0.581	0.000
Juchandra	0.000	0.879	0.000	0.000
Kaman	9.488	0.000	0.000	0.000
Malajipada	32.403	37.629	0.571	0.014
Sasunawaghar	137.474	97.211	7.275	0.180
Grand Total	**179.365**	**136.224**	**8.427**	**0.194**

Source: Consultant Analysis

Table 8.6 Village wise area distribution in different zones in Vasai Taluka

Village Name	ESZ-1 (Ha)	ESZ-2 (Ha)	ESZ-3 (Ha)	Waterbodies (Ha)	SGNP Division Forest (Ha)
Mori	5.560	151.413	0.000	1.742	0.000
Nagle	0.000	40.735	13.208	20.778	0.000
Poman	2.845	78.964	0.000	1.560	0.000
Sarjamori	0.000	0.102	1.093	1.921	0.000
Shilottar	0.000	5.572	0.000	0.017	0.000
Grand Total	**8.405**	**276.786**	**14.301**	**26.018**	**0.000**

Source: Consultant Analysis

Table 8.7 Village wise area distribution falling under IIA in different zones in BMC

Village Name	ESZ-1 (Ha)	ESZ-2 (Ha)
Aarey	0.62	446.28
Akurli	0.00	1.02
Dindoshi	0.00	4.71
Malad-e	0.00	0.01
Marol Maroshi	0.09	126.34
Prajapur	0.00	0.12
Saai	0.00	0.48
Grand Total	**0.72**	**579.08**

Source: Consultant Analysis

Table 8.8 Village wise area distribution falling under IIA in different zones in MBMC

Village Name	ESZ-1 (Ha)	ESZ-2 (Ha)	ESZ-3 (Ha)	Area for Eco Tourism (Ha)
Chenne	0.00	78.936	18.237	47.485
Ghodbunder	9.13	13.18	0.00	0.00
Kashi	0.00	16.73	0.00	0.00
Versave	4.54	56.478	13.018	0.00
Grand Total	**13.67**	**165.324**	**31.255**	**47.485**

Source: Consultant Analysis

Table 8.9 Village wise area distribution falling under IIA in different zones in VVCMC

Village Name	ESZ-1	ESZ-2	ESZ-3	Area for Eco Tourism
Sasunavghar	0.00	55.821	0.842	0.00
Maljipada	0.00	0.00	0.00	0.00
Juchandra	0.00	0.00	0.00	0.00
Bapane	0.00	0.00	0.00	0.00
Kaman	0.00	0.00	0.00	0.00
Grand Total	**0.00**	**55.821**	**0.842**	**0.00**

Source: Consultant Analysis

Table 8.10 Village wise area distribution falling under IIA in different zones in VT

Village Name	ESZ-1	ESZ-2	ESZ-3	Area for Eco Tourism
Nagale	0.00	23.454	14.602	0.00
Shillotar	0.00	5.032	0.00	0.00
Poman	0.842	27.831	0.00	0.00
Mori	0.00	8.058	0.00	0.00
Sarjamori	0.00	0.00	0.00	0.00
Grand Total	**0.842**	**64.375**	**14.602**	**0.00**

Source: Consultant Analysis

Table 8.11 Village wise area distribution falling under IIA in different zones in TMC

Village Name	ESZ-1	ESZ-2	ESZ-3	Area for Eco Tourism
Bhaindar pada	0.00	19.884	18.615	0.00
Boriwade	0.38	0.00	0.00	0.00
Chitalsar manpada	0.38	0.35	0.00	0.00

Kolshet	0.05	1.98	0.00	0.00
Majiwade	14.26	4.44	0.00	0.00
Owala	2.61	3.15	0.00	0.00
Pachpakhadi	12.56	0.00	0.00	0.00
Yeoor	0.00	173.74	0.00	19.94
Grand Total	**30.24**	**203.544**	**18.615**	**19.94**

Source: Consultant Analysis

Please refer Annexure VIII for the same.

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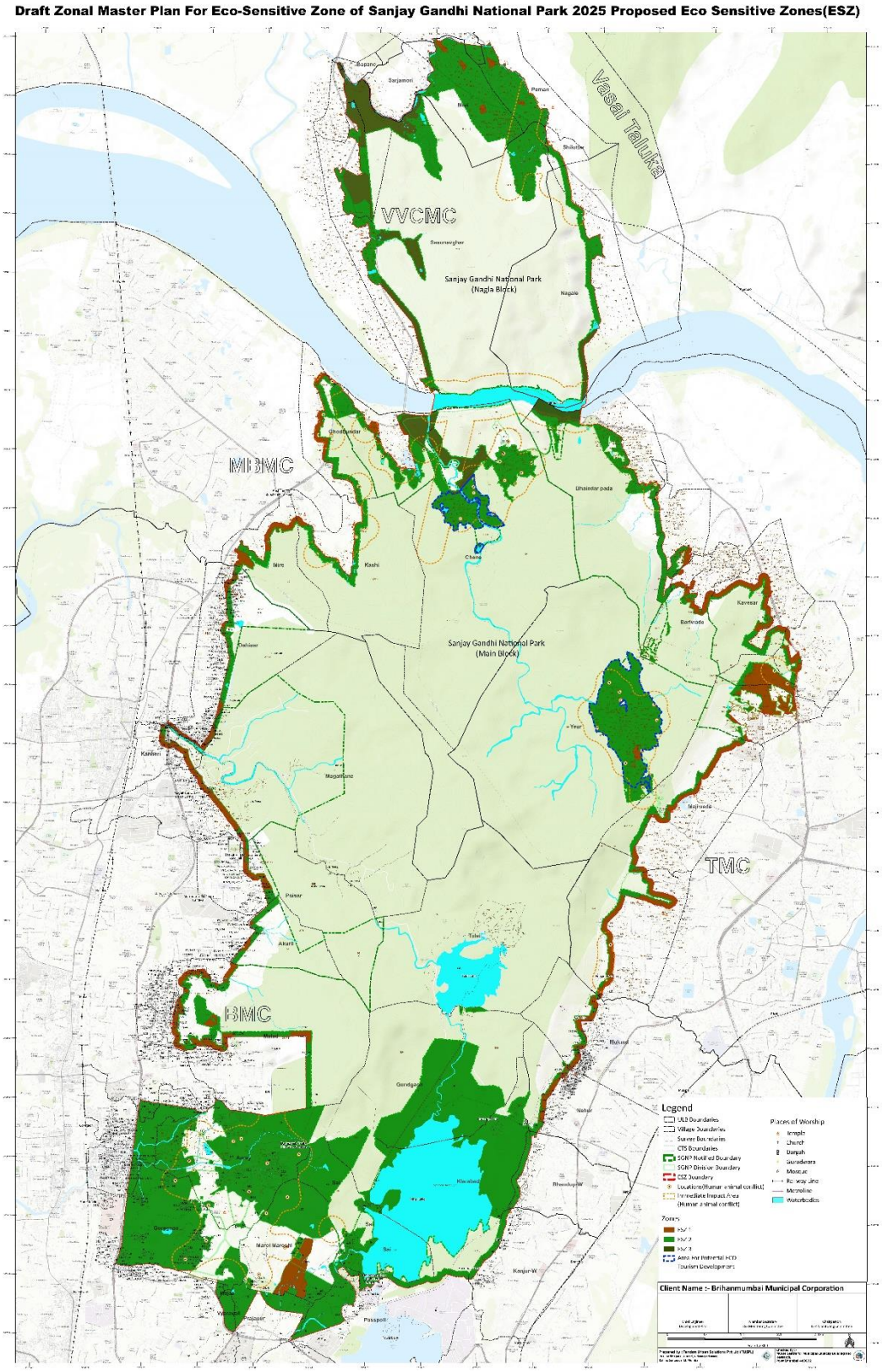
Figure 8.1 Proposed Zoning for Eco Sensitive Zone of Sanjay Gandhi National Park



Source: Consultant Analysis

8.9 Additional measures for Zones

Additional Measures to be taken for development in ESZ-1 areas sharing boundaries with Sanjay Gandhi National Park, and all ESZ-2 areas.

1. No artificial lighting from buildings or streetlights within the Eco-Sensitive Zone (ESZ) should be directed toward Sanjay Gandhi National Park.
2. Rainwater harvesting is mandatory for all buildings located within the ESZ.
3. The natural flow of streams and rivulets within the ESZ must remain unobstructed. Activities such as borewell digging and check dam construction are prohibited as per Section 35(6) of the Wildlife (Protection) Act, 1972.
4. A properly approved solid waste disposal plan must be in place.
5. Solid waste must be segregated into biodegradable and non-biodegradable components.
6. Biodegradable waste should be processed through composting or vermiculture wherever possible.
7. Inorganic waste should be disposed of in an environmentally responsible manner at designated sites outside the ESZ. Burning or incineration of solid waste within the ESZ is strictly prohibited.
8. Underground solid waste pits to be constructed by respective ULBs instead of public bins, all developments to have solid waste management room near entrance and avoid keeping solid waste bins in open areas.
9. An eco-friendly sludge and solid waste disposal system must be implemented, along with an internal effluent recycling system within the property.
10. All personnel involved in project work must comply with applicable legal provisions, including the Environmental (Protection) Act, 1986, and the Wildlife (Protection) Act, 1972. Necessary precautions should be taken to conserve and protect the flora and fauna in the surrounding area.
11. A barricade must be installed at the work site during construction to prevent accidents involving humans or wildlife.
12. Strict adherence to regulations on noise, air, and water pollution is required, along with necessary measures to minimize noise, dust, and air pollution for all the activities that are carried out in ESZ.
13. Open dumping of debris shall be strictly prohibited in ESZ.
14. Blasting activities shall be strictly prohibited within the ESZ.
15. The compound wall must be of sufficient height along the boundary, reinforced with safety features to mitigate human-animal conflicts. Instead of compound wall; bio fencing, grills and other sustainable measures may also be considered. Trenches of appropriate depth which does not harm wildlife shall also be made wherever possible.
16. Discharging untreated effluents and solid waste into natural water bodies or on land shall be prohibited.
17. Cutting of hill slopes and riverbanks shall be prohibited.
18. Surface water and groundwater must not be extracted for industrial or commercial purposes.

19. Adoption of scaled decentralized approach by ULBs is recommended for the treatment of liquid and solid waste, utilizing nature-based solutions for sustainable and effective waste management.
20. Open burning of waste, crop etc. shall be prohibited.
21. No new vehicular garages, repairing shops, showrooms, fuel stations shall be permitted in ESZ area.
22. Seed-nursery of native plants and species to be planted in ESZ area wherever required as per ZMP shall be developed within ESZ.
23. Landscape elements with clear visibility measures should be used instead of using dense bushes and shrubs.
24. CCTV cameras shall be mandatory for all developments within conflict zones.

8.10 Recommendations and Measures for ESZ

In addition to all the measures which are mentioned above, specific to each zone, the following mitigation measures are necessary to address the vulnerabilities and conflicts in ESZ.

1.) **Mining Sites:** Mining is prohibited to be carried out under the ESZ notification. The mining sites are closed however the land is degraded and in denuded condition with no vegetation. The land under the Closed mining at the following location, which are in ESZ and close to the Sanjay Gandhi National Park boundary must be afforested through suitable measures.

a. Closed mining site Ketki pada, Dahisar. This land falls under SGNP Division Forest area and requires immediate afforestation in order to restore its ecology.

b. Closed mining site at Poisar, Kandivali East. Part of this mining site also falls under SGNP Division Forest area and requires immediate afforestation in order to restore its ecology.

c. Sand Depot site at Gaimkuh, Bhaidarpada. An operation sand depot is present at the Gaimukh which requires immediate measures to does not affect the eco sensitive zone environment.

2.) Industrial Use:

a) 3 existing industries are functioning in the Eco Sensitive Zone in BMC namely two RMC plants and large bakery unit, which are of polluting nature and adequate measures for Pollution control or relocation of the Industrial activities is recommended.
b) 17 existing industries located within the Eco-Sensitive Zone in the Mira-Bhayandar Municipal Corporation (MBMC) area are currently operating and are considered polluting. The area comprises a mix of construction-related industries (RMC plants, casting yards, interlocking tile and paver

manufacturing), chemical and allied industries (paint, dyeing, and ink manufacturing), metal and mechanical manufacturing units (metal parts, boat propellers, agitators), and paper and packaging industries (cardboard and paper manufacturing). It is recommended that appropriate pollution control measures be implemented or that these industries be relocated.

c) 5 existing industries are functioning in the Eco Sensitive Zone in VVCMC, which are of polluting nature and adequate measures for Pollution control or relocation of the Industrial activities is recommended. The area includes petroleum and chemical processing industries (used oil recycling, crude oil distillation, grease manufacturing), food industry (ice factory), animal by-product processing (bone and tallow industry), and construction material industries (Ready Mix Concrete and RMC plants).

d) 56 industries are operating in Eco Sensitive Zone in Vasai Taluka Region which are polluting in nature and adequate measures for Pollution control or relocation of the Industrial activities is recommended. These industries span textiles, chemicals, rubber, plastics, engineering, furniture, and electrical manufacturing, with diverse pollution levels ranging from low to high in some of the industrial activities.

e) 61 industries are operating in Eco Sensitive Zone in TMC Region which are polluting in nature and adequate measures for Pollution control or relocation of the Industrial activities is recommended. Major industries include Casting yard for Thane Borivali Tunnel, J Kumar Infraprojects Pvt Ltd (Pier and Girders for Metro). These industries represent a mix of engineering, fabrication, construction, woodworks, packaging, and chemical processing units. The pollution level ranges from low to high in some of the industrial activities.

List of all the industries in all the ULBs can be referred in the sub-section 6.3.1.

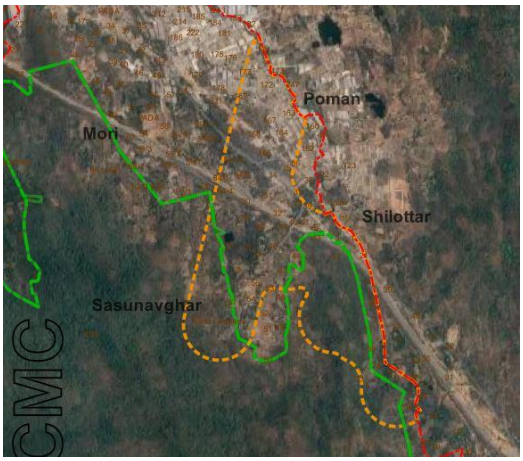
3.) **Slums & Encroachments in ESZ**: Slums are the major habitation observed in the ESZ and needs to be rehabilitated on priority. It is recommended that the SRA, undertake the survey of the slums and rehabilitate the eligible slum dwellers in situ, and ineligible Slum Dwellers and PAP shall preferably be rehabilitated outside of ESZ and no free sale component to be permitted within ESZ.

- Total of 42.71 Ha of SGNP Division Forest area is encroached.
- About 73 Ha of Notified Forest is already encroached.

- In all, 115.71 Ha of SGNP Division and Notified Forest land is encroached.

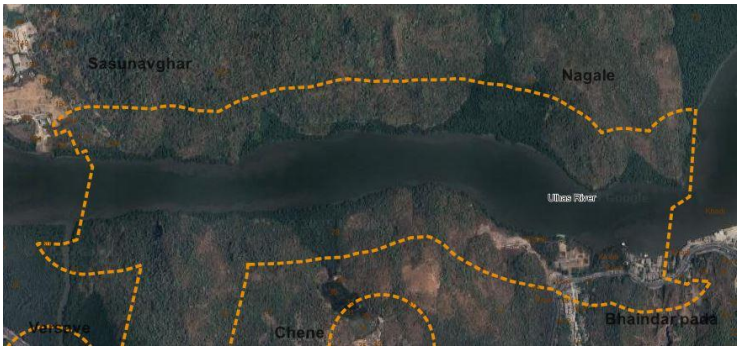
4.) **Boundary Wall for SGNP:** To prevent the movement of animals, primarily Leopard and Big Cats, into settlements, a boundary wall of appropriate material and height is proposed to be constructed all around the SGNP, except over Animal Movement Corridors, as per the specification of the Forest Department and SGNP. Compound wall must be reinforced with safety features to mitigate human-animal conflicts. Boundary walls falling within ESZ-1 of the Eco Sensitive Zonal Masterplan, within the Immediate Impact Zone of Human Animal Conflict area is proposed to be constructed on priority.

5.) **Animal Corridors:** To aid in the movement of the Animals across land, Animal corridors shall be created at locations where there is a break in continuity of forest due to rivers, highways, settlements etc. Such Animal Corridors shall be about 20 to 50 metres in width and shall be planted with vegetation, as if the corridors are an extension of the forest itself. Such corridors shall be at a distance of every 2 to 3 Km depending on the movement patterns of the animals, which the Forest department shall suggest. Probable locations for these overpasses as animal corridors is over Chinchoti Anjur Phata Marg and Virar Alibag Multi Modal Corridor and Dedicated Freight Corridor. Same is to be proposed over Diva-Kaman Railway line since it is also a probable animal corridor. Ghodbunder Road Crossing is another movement corridor. Overpasses connecting the Main block to Nagla block shall be proposed at 2-3 locations over creek.



Diva-Kaman Railway Crossing and Chinchoti Anjur Phata Marg

Ghodbunder Road



Vasai Creek/Ulhas River Portion

All Transportation projects which break the continuity of the animal movement corridor must compulsorily include the construction of the animal corridors of appropriate width and type, as per requirement of SGNP.

Few specimens of overpass corridors is given below.

6.) **Transition and Buffer for SGNP**: All properties sharing the boundary with SGNP shall maintain a minimum green buffer of 10 Meters from the Wall of SGNP. No built structure shall be allowed in this buffer. This shall be applicable to all new construction and redevelopment. This buffer shall be planted with native trees as required for the layout open spaces. Necessary modifications in DCPR 2034 and UDCPR are suggested.

7.) **Protection of Water bodies in ESZ:** All water bodies (Lakes and Nallahs) shall strictly maintain a buffer of 15 Meters. It is preferable the Water bodies are undertaken for rejuvenation and Beautification, so as to protect them. Beautification shall have less than 15% hardscaping. Necessary Gully Plugs/Nalla bunds may be made by the landowners in restricted development zone as a water source for fauna.

8.) **Environmental Management Plan:** It is recommended that EMP be compulsorily prepared and approved from competent Authority for all projects that fall fully or partly within the ESZ of SGNP. The EMP not only cover the

construction phase but post construction phase and audit shall be done before granting the Occupation Certificate. EMP is made compuylsory for all projects or construction being proposed/undertaken in ESZ II, irrespective of Size of construction/project.

9.) **Wildlife Mitigation Plan**: Wildlife Mitigation Plan shall be prepared and submitted for all projects which fall within the Immediate Impact Area of Human Animal Conflict and approved by the competent Authority. Wildlife Mitigation Plan shall be audited and complied before granting any Occupation Certificate. Wildmife Mitigation Plan is made compuylsory for all projects or construction being proposed/undertaken within the Immediate Impact Area of Human Animal Conflict, irrespective of Size of construction/project.

10.) **Sensitization Program:** The Forest department shall initiate a sensitization program in schools and Residential Societies, slums located in ESZ to sensitize children's and other residents on Wildlife, their movements, their habitats, foods, dangers and mitigation of such dangers. This program can be done with the aid of NGO's and Self-Help groups and this program can aid the residents of ESZ in becoming aware about the ESZ and Wildlife.

11.) **Animal Rescue Centre:** Animal rescue centres shall be developed by competent authority in ESZ areas with high density of human-animal conflict such as Aarey. Rapid Action Cells to be deployed in areas with immediate impact zone of human animal conflict areas to work as a rapid response in case of any instance of human animal conflict.

12.) **Preservation of cultural Heritage:** In order to preserve the natural and manmade heritage that is present in the Eco Sensitive Zone in form of cultural, natural, historical and intellectual or technological heritage requires sensitive measures. Preservation of adivasi folk traditions and music of Warlis, Malhar Kolis, Katkaris and Koknas by supporting cultural documentation, events, and education programs within the ESZ. Since major historical heritage is present inside SGNP in form of Kanheri caves, it is only accessed through ESZ whose preservation should be prioritized.

13.) **Revision of Zonal Master Plan** - This Zonal Master Plan shall be reviewed and updated at intervals of every 20 years from the date of its approval to ensure its relevance and alignment with evolving developmental needs and planning objectives within the Eco Sensitive Zone.

14.) **Conservation measures for existing waterbodies**

a) Water Quality Management & Pollution Control: Implement and enforce bans on littering, sewage discharge, and industrial waste dumping near and in water bodies. Conduct periodic monitoring of pollutants, pH levels, and contamination to ensure ecological stability. Develop natural filtration systems such as wetlands and bio-remediation zones to prevent pollutants from entering lakes and rivers.

b) Wetland & Habitat Restoration: Preserve and restore vegetation along water bodies to reduce soil erosion and enhance water retention. Eliminate non-native plants, such as water hyacinth, that disrupt the aquatic ecosystem. Promote the reintroduction and growth of indigenous aquatic flora and fauna to maintain ecological balance.

c) Sustainable Water Management: Develop percolation pits, check dams, and contour trenches to enhance groundwater replenishment. Periodically clear excess silt and debris from water bodies to preserve depth and optimize water storage. Regulate and monitor water usage for human and commercial purposes to prevent over-extraction and depletion.

15.) Management of catchment areas

a) Plant native trees and grasses to reduce soil erosion and improve water infiltration.

b) Implement slope stabilization techniques to prevent runoff and retain moisture.

c) Prevent dumping of industrial, agricultural, and domestic waste into water bodies.

d) Implement rotational grazing to prevent overgrazing and protect soil health.

e) Integrate tree planting with farming to enhance biodiversity and soil fertility.

f) Enforce strict regulations against illegal settlements and deforestation in catchment areas.

g) Conduct workshops and awareness campaigns on water conservation.

h) Strengthen policies and use remote sensing for continuous monitoring of catchment health.

16.) Measures for groundwater management

a) Build small check dams and recharge pits to enhance groundwater infiltration. Develop rainwater collection systems to store and utilize runoff efficiently. Create contour bunding on slopes to slow down runoff and increase percolation.

b) Desilt and restore natural water bodies like Vihar and Tulsi lakes to maintain water storage capacity. Preserve vegetation along riverbanks to prevent sedimentation and improve water retention. Monitor and control water usage for human and commercial activities to prevent over-extraction.

c) Plant native trees to enhance soil moisture and reduce evaporation. Prevent deforestation, construction, and human interference in groundwater recharge zones. Use mulching, cover crops, and organic matter to retain soil moisture.

d) Engage local residents from nearby villages and tribal communities in water conservation programs. Use remote sensing and GIS to track groundwater levels and identify depletion areas. Implement strict legal measures to prevent illegal borewells and overuse of water resources.

17.) Measures to be followed for vehicular traffic within ESZ:

a) All the roads that are present in the ESZ area shall have avenues/dense plantations on both the sides of the roads in order to create as sound barrier to reduce pollution.

b) Proper signages mentioning that the vehicle is in the ESZ area should be displayed at regular intervals in the ESZ.

c) No horn policy shall be applied within the Eco Sensitive Zone area to protect the environment and wildlife from noise.

d) Any road project in the ESZ shall require permission from the ESZ monitoring committee.

e) Strict speed regulations shall be applied with warning of wildlife presence.

f) Installation of Traffic Chowkies and CCTV coverage of roads for effective management of traffic to be incorporated.

g) Commercial vehicles except emergency vehicles shall be regulated within ESZ during night hours.

h) Electric buses or clean energy transport shall be preferably to be deployed on public transport routes within ESZ.

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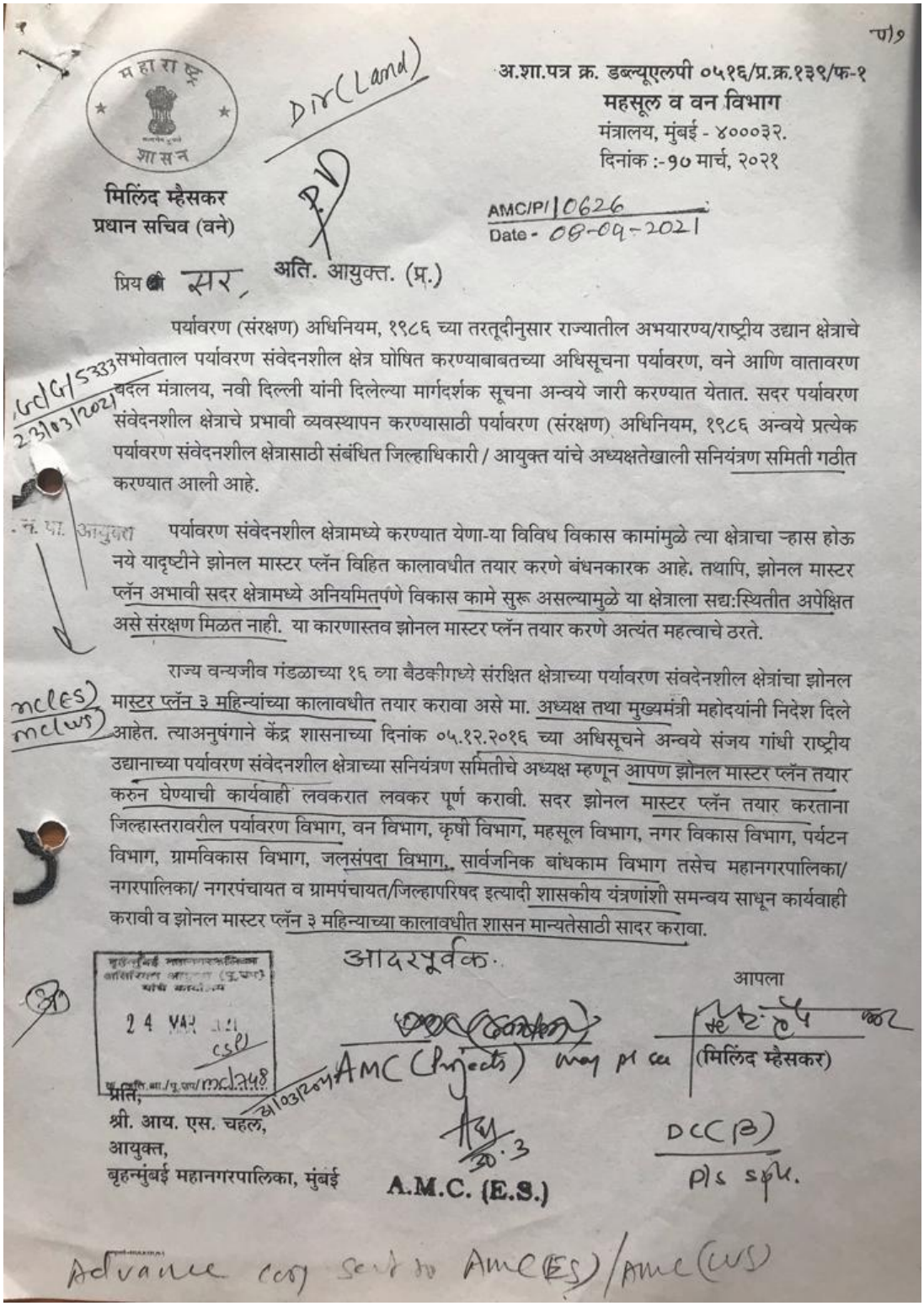
10 ANNEXURES

10.1 ANNEXURE-I-State directions to BMC

10.1.1 State directions to BMC for preparation of Zonal Master Plan for Eco Sensitive Zone of Sanjay Gandhi National Park



महाराष्ट्र शासन

मिलिंद म्हैसकर
प्रधान सचिव (वने)

अ.शा.पत्र क्र. डब्ल्यूएलपी ०५१६/प्र.क्र.१३९/फ-१
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दिनांक :- १० मार्च, २०२१

AMC/P/10626
Date - 08-09-2021

प्रिय सर, अति. आयुक्त. (प्र.)

पर्यावरण (संरक्षण) अधिनियम, १९८६ च्या तरतूदीनुसार राज्यातील अभयारण्य/राष्ट्रीय उद्यान क्षेत्राचे सभोवताल पर्यावरण संवेदनशील क्षेत्र घोषित करण्याबाबतच्या अधिसूचना पर्यावरण, वने आणि वातावरण बदल मंत्रालय, नवी दिल्ली यांनी दिलेल्या मार्गदर्शक सूचना अन्वये जारी करण्यात येतात. सदर पर्यावरण संवेदनशील क्षेत्राचे प्रभावी व्यवस्थापन करण्यासाठी पर्यावरण (संरक्षण) अधिनियम, १९८६ अन्वये प्रत्येक पर्यावरण संवेदनशील क्षेत्रासाठी संबंधित जिल्हाधिकारी / आयुक्त यांचे अध्यक्षतेखाली सनियंत्रण समिती गठीत करण्यात आली आहे.

पर्यावरण संवेदनशील क्षेत्रामध्ये करण्यात येणा-या विविध विकास कामांमुळे त्या क्षेत्राचा ऱ्हास होऊ नये यादृष्टीने झोनल मास्टर प्लॅन विहित कालावधीत तयार करणे बंधनकारक आहे. तथापि, झोनल मास्टर प्लॅन अभावी सदर क्षेत्रामध्ये अनियमितपणे विकास कामे सुरू असल्यामुळे या क्षेत्राला सद्य:स्थितीत अपेक्षित असे संरक्षण मिळत नाही. या कारणास्तव झोनल मास्टर प्लॅन तयार करणे अत्यंत महत्वाचे ठरते.

राज्य वन्यजीव मंडळाच्या १६ व्या बैठकीमध्ये संरक्षित क्षेत्राच्या पर्यावरण संवदेनशील क्षेत्रांचा झोनल मास्टर प्लॅन ३ महिन्यांच्या कालावधीत तयार करावा असे मा. अध्यक्ष तथा मुख्यमंत्री महोदयांनी निदेश दिले आहेत. त्याअनुषंगाने केंद्र शासनाच्या दिनांक ०५.१२.२०१६ च्या अधिसूचने अन्वये संजय गांधी राष्ट्रीय उद्यानाच्या पर्यावरण संवेदनशील क्षेत्राच्या सनियंत्रण समितीचे अध्यक्ष म्हणून आपण झोनल मास्टर प्लॅन तयार करुन घेण्याची कार्यवाही लवकरात लवकर पूर्ण करावी. सदर झोनल मास्टर प्लॅन तयार करताना जिल्हास्तरावरील पर्यावरण विभाग, वन विभाग, कृषी विभाग, महसूल विभाग, नगर विकास विभाग, पर्यटन विभाग, ग्रामविकास विभाग, जलसंपदा विभाग, सार्वजनिक बांधकाम विभाग तसेच महानगरपालिका/ नगरपालिका/ नगरपंचायत व ग्रामपंचायत/जिल्हापरिषद इत्यादी शासकीय यंत्रणांशी समन्वय साधून कार्यवाही करावी व झोनल मास्टर प्लॅन ३ महिन्याच्या कालावधीत शासन मान्यतेसाठी सादर करावा.

आदरपूर्वक.

आपला

(मिलिंद म्हैसकर)

प्रति,
श्री. आय. एस. चहल,
आयुक्त,
बृहन्मुंबई महानगरपालिका, मुंबई

A.M.C. (E.S.)

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10.2 ANNEXURE-II–Eco Sensitive Zone Notification, 2016

10.2.1 Eco-Sensitive Zone Notification

[भाग II—खण्ड 3(ii)] भारत का राजपत्र : असाधारण 20

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 5th December, 2016

S.O. 3645(E).—Whereas, a draft notification, declaring Eco-sensitive Zone around Sanjay Gandhi National Park, Borivali in Mumbai of Maharashtra State, was published in the Gazette of India, Extraordinary, vide notification of the Government of India in the Ministry of Environment, Forest and Climate Change number S.O. 229(E), dated the 22nd January, 2016, inviting objections and suggestions from all persons likely to be affected thereby within a period of sixty days from the date on which copies of the Gazette containing the said notification were made available to the public;

AND WHEREAS, copies of the Gazette containing the said notification were made available to the public on the 22nd January, 2016;

AND WHEREAS, objections and suggestions received from all persons and stakeholders in response to the draft notification have been duly considered by the Central Government;

AND WHEREAS, the Sanjay Gandhi National Park (hereinafter referred to as the National Park) is a unique habitat enclosed in the metropolis of Mumbai and is located in the Thane and Mumbai District of Maharashtra State between N 19° 8.8" to 19° 21" latitude and E 72° 53" to 72 ° 58" longitudes;

AND WHEREAS the National Park is home to a number of endangered species of flora and fauna and harbours approximately 1300 species of flowering plants, 45 species of mammals, 43 species of reptiles, including 38 species of snakes, 12 species of amphibians, 300 species of birds, 150 species of butterflies;

AND WHEREAS, the area is known for mammalian species such as Leopard (*Panthera pardus*), Wild Boar (*Sus sp*), Four Horned Antelope (*Tetracerus quadricornis)*, Blacknaped Hare, Wild Cat (*Felis chaus)*, Jackal (*Canis aureus)*, and Porcupine (*Hystrix indica)* and also harbours many bird species such as Peacock (*Pavo cristatus)*, Lesser Grebe, Purple Heron (*Ardea purpurea)*, Smaller Egret, Lesser Whistling Teal, Pariah Kite, Bulbul and many reptiles are also found in the National Park including snakes as Indian Cobra and Viper;

AND WHEREAS, the vegetation of the area ranges from littoral forests to western sub-tropical hill forests and as per the revised classification of Indian Forest Types by Champion and Seth, the National Park has Southern Tropical Moist Mixed Deciduous Forest and Western Sub Tropical Hill Forest and some of the tree species are *Tectona grandis*, *Terminalia tomentosa*, *Acacia catechu*, *Adina cordifolia*, *Mitragyna parviflora*, *Pterocarpus marsupium*, Holarrhena antidyssentrica, Butea monosperma, and Diospyros melanoxylon etc.;

AND WHEREAS, it is necessary to conserve and protect the area the extent and boundaries of which is specified in paragraph 1 of this notification around the Sanjay Gandhi National Park as Eco-sensitive Zone from ecological and environmental point of view and to prohibit industries or class of industries and their operations and processes in the said Eco-sensitive Zone;

NOW Therefore, in exercise of the power conferred by sub-section(1) and clauses (v) and (xiv) of sub-section (2) and sub-section (3) of section 3 of the Environment (Protection) Act 1986 (29 of 1986) read with sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby notifies an area to an extent of 100 meters to four kilometers from the boundary of Sanjay Gandhi National Park in the State of Maharashtra as the Sanjay Gandhi National Park Eco-sensitive Zone (hereinafter after referred to as Eco-sensitive Zone) details of which are as under, namely:-

1. **Extent and boundaries of Eco-sensitive Zone**.—(1) The Eco-sensitive Zone is spread over an area of 59.456 sq.km to an extent of 100 meters to four kilometers from the boundary of Sanjay Gandhi National Park and the boundary description of the Eco-sensitive Zone is given in **Annexure I**.

(2) The map of the Eco-sensitive zone along with latitude and longitude is included in **Annexure II.**

(3) The list of the villages falling within Eco-sensitive Zone is included in Annexure **III.**

2. Zonal Master Plan for Eco-sensitive Zone.—(1) The State Government shall, for the purpose of the Eco-sensitive Zone prepare, a Zonal Master Plan, within a period of two years from the date of publication of this

notification in the Official Gazette, in consultation with local people and adhering to the stipulations given in this notification.

(2) The said Plan shall be approved by the Competent Authority in the State Government.

(3) The Zonal Master Plan for the Eco-sensitive Zone shall be prepared by the State Government in such manner as is specified in this notification and also in consonance with the relevant Central and State laws and the guidelines issued by the Central Government, if any.

(4) The Zonal Master Plan shall be prepared in consultation with all concerned State Departments, namely:-

(i) Environment;

(ii) Forest;

(iii) Urban Development;

(iv) Tourism;

(v) Municipal;

(vi) Revenue;

(vii) Agriculture;

(viii) Maharashtra State Pollution Control Board;

(ix) Irrigation;

(x) Public Works Department;

for integrating environmental and ecological considerations into it.

(5) The Zonal Master Plan shall not impose any restriction on the approved existing land use, infrastructure and activities, unless so specified in this notification and the Zonal Master Plan shall factor in improvement of all infrastructure and activities to be more efficient and eco-friendly.

(6) The Zonal Master plan shall provide for restoration of denuded areas, conservation of existing water bodies, management of catchment areas, watershed management, groundwater management, soil and moisture conservation, needs of local community and such other aspects of the ecology and environment that need attention.

(7) The Zonal Master Plan shall demarcate all the existing worshipping places, village and urban settlements, types and kinds of forests, agricultural areas, fertile lands, green area, such as, parks and like places, horticultural areas, orchards, lakes and other water bodies.

(8) The Zonal Master Plan shall regulate development in Eco-sensitive Zone as to ensure Eco-friendly development for livelihood security of local communities.

3. Measures to be taken by State Government.—The State Governments shall take the following measures for giving effect to the provisions of this notification, namely:-

(1) **Land use**.—Forests, horticulture areas, agricultural areas, parks and open spaces earmarked for recreational purposes in the Eco-sensitive Zone shall not be used or converted into areas for commercial or industrial related development activities:

Provided that the conversion of agricultural lands, including the lands included in the category of the no development zones in the Development Plan of the adjoining cities, within the Eco-sensitive Zone may be permitted on the recommendation of the Monitoring Committee, and with the prior approval of the State Government, to meet the residential needs of local residents, and for the activities listed against serial numbers 10, 16, 22, 32 and 35 in column (2) of the Table in paragraph 4, namely:-

(i) Eco-friendly cottages for temporary occupation of tourists, such as tents, wooden houses, etc. for Eco-friendly tourism activities;

(ii) Widening and strengthening of existing roads, construction of new roads and other infrastructure works such as Mumbai metro rail, etc.;

(iii) Renovation and augmentation and upgradation of civic amenities including creation of infrastructure for water supply and storage and other civic amenities, including augmentation and upgradation of existing transmission lines, telecommunication towers, etc and establishment of new underground transmission cables and communication cables, etc;

(iv) Small scale industries not causing pollution,

(v) Rainwater harvesting, and

(vi) Cottage industries including village industries, convenience stores, local amenities, public utility and community buildings:

Provided further that no use of tribal land shall be permitted for commercial and industrial development activities without the prior approval of the State Government and without compliance of the provisions of article 244 of the Constitution or the law for the time being in force, including the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007):

Provided also that any error appearing in the land records within the Eco-sensitive Zone shall be corrected by the State Government, after obtaining the views of Monitoring Committee, once in each case and the correction of said error shall be intimated to the Central Government in the Ministry of Environment, Forest and Climate Change:

Provided also that the above correction of error shall not include change of land use in any case except as provided under this sub-paragraph.

Provided also that there shall be no consequential reduction in green area, such as forest area and agricultural area and efforts shall be made to reforest the unused or such unproductive agricultural areas.

(2) **Natural Springs.**—The catchment areas of all natural springs shall be identified and plans for their conservation and rejuvenation shall be incorporated in the Zonal Master Plan and the guidelines shall be drawn up by the State Government in such a manner as to prohibit development activities at or near these areas as which are detrimental to such areas.

(3) Tourism.—

(a) The activity relating to tourism within the Eco-sensitive Zone shall be as per the Tourism Master Plan, which shall form part of the Zonal Master Plan.

(b) The Tourism Master Plan shall be prepared by the Department of Tourism, Government of Maharashtra in consultation with Department of Revenue and Forests, Government of Maharashtra.

(c) The activity of tourism shall be regulated as under, namely:-

(i) all new tourism activities or expansion of existing tourism activities within the Eco-sensitive Zone shall be in accordance with the guidelines issued by the Central Government in the Ministry of Environment, Forest and Climate Change and the eco-tourism guidelines issued by National Tiger Conservation Authority, (as amended from time to time) with emphasis on eco-tourism, eco-education and eco-development and based on carrying capacity study of the Eco- sensitive Zone;

(ii) new construction of hotels and resorts shall not be permitted within one kilometer from the boundary of the Sanjay Gandhi National Park or the extent of Eco-sensitive Zone, whichever is nearer, except for accommodation for temporary structures for tourists related to Eco-friendly tourism activities:

Provided that beyond one kilometer from the boundary of protected area till the extent of the Eco-sensitive Zone, the establishment of new hotels and resorts shall be permitted only in pre-defined and designated areas for Eco-tourism facilities as per Zonal Master Plan;

(iii) till the Zonal Master Plan is approved, development for eco-tourism and expansion of existing tourism activities shall be permitted by the concerned regulatory authorities based on the actual site specific scrutiny and recommendation of the Monitoring Committee.

(4) **Natural Heritage**.—All sites of valuable natural heritage in the Eco-sensitive Zone, such as the gene pool reserve areas, water bodies, rock formations, waterfalls, springs, gorges, groves, caves, points, walks, rides, cliffs, etc. shall be identified and preserved and plan shall be drawn up for their protection and

conservation, within six months from the date of publication of this notification and such plan shall form part of the Zonal Master Plan.

(5) **Man-made heritage sites.**—Buildings, structures, artifacts, areas and precincts of historical, architectural, aesthetic, and cultural significance shall be indentified in the Eco-sensitive Zone and plans for their conservation shall be prepared within six months from the date of publication of this notification and incorporated in the Zonal Master Plan.

Noise pollution.—The Environment Department of the State Government or Maharashtra State Pollution Control Board shall implement the regulations for control of noise pollution in the Eco-sensitive Zone in accordance with the provisions stipulated of The Noise Pollution (Regulation And Control) Rules, 2000 under the Environment (Protection) Act, 1986.

(6) **Air pollution.**—The Environment Department of the State Government or Maharashtra State Pollution Control Board shall draw up guidelines and regulations for the control of air pollution in the Eco-sensitive Zone in accordance with the provisions of the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) and the rules made thereunder.

(7) **Discharge of effluents.**—The discharge of treated effluent in Eco-sensitive Zone shall be in accordance with the provisions of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974) and the rules made thereunder.

(9) **Solid wastes.**—Disposal of solid wastes shall be as under:-

(i) the solid waste disposal in Eco-sensitive Zone shall be carried out as per the provisions of the Solid Waste Management Rules, 2016 published by the Government of India, Ministry of Environment and Forests and Climate Change vide notification number S.O. 1357 (E), dated the 8th April, 2016 as amended from time to time;

(ii) the local authorities shall draw up plans for the segregation of solid wastes into biodegradable and non-biodegradable components;

(iii) the biodegradable material shall be recycled preferably through composting or vermiculture;

(iv) The inorganic material may be disposed in an environmental acceptable manner at site identified outside the Eco-sensitive Zone and no burning or incineration of solid wastes shall be permitted in the Eco-sensitive Zone.

(10) **Bio-medical waste.**— The bio-medical waste disposal in the Eco-sensitive Zone shall be carried out as per the provisions of the Bio-Medical Waste Management Rules, 2016 published by the Government of India, Ministry of Environment, Forest and Climate Change vide Notification number GSR 343 (E), dated the 28th March, 2016 as amended from time to time.

(11) **Vehicular traffic**.—The vehicular movement of traffic shall be regulated in a habitat friendly manner and specific provisions in this regard shall be incorporated in the Zonal Master Plan and till such time as the Zonal master plan is prepared and approved by the Competent Authority in the State Government, the Monitoring Committee shall monitor compliance of vehicular movement under the relevant Acts and the rules and regulations made thereunder.

(12) Industrial Units.—

(a) No establishment of new wood based Industries within the proposed Eco-sensitive Zone shall be permitted except the existing wood based Industries set up as per the Law.

(b) No establishment of any new Industry causing water, air, soil, noise pollution within the proposed Eco-sensitive Zone shall be permitted.

4. List of activities prohibited or to be regulated within the Eco-sensitive Zone.—All activities in the Eco sensitive Zone shall be governed by the provisions of the Environment (Protection) Act, 1986 (29 of 1986), and the rules made thereunder and be regulated in the manner specified in the Table below, namely:-

TABLE

S. No.	Activity	Remarks
	Prohibited Activities	
1.	Commercial Mining, stone quarrying and crushing units.	New and existing mining (minor and major minerals), stone quarrying and crushing units shall be prohibited except for the domestic needs of bona fide local residents with reference to digging of earth for construction or repair of houses and for manufacture of country tiles or bricks for housing for personal use. The license/lease of existing mines and stone crushers shall not be extended. If license violates the existing rules under different Acts, the license will be terminated The mining operations shall strictly be in accordance with the interim order of the Hon'ble Supreme Court dated 04.08.2006 in the matter of T.N. Godavarman Thirumulpad Vs. UOI in W.P.(C) No. 202 of 1995 and order of the Hon'ble Supreme Court dated 21.04.2014 in the matter of Goa Foundation Vs. UOI in W.P.(C) No. 435 of 2012.
2.	Setting up of saw mills.	No new or expansion of any existing saw mills shall be permitted within the Eco-sensitive Zone.
3.	Setting up of Industries causing water or air or soil or noise pollution	No new or expansion of polluting Industries in the Eco-sensitive Zone shall be permitted
4.	Establishment of hydroelectric projects and thermal power plants	Prohibited (except as otherwise provided) as per applicable laws.
5.	Use or production of any hazardous substances.	Prohibited (except as otherwise provided) as per applicable laws.
6.	Discharge of untreated effluents and solid waste in natural water bodies or land area.	Prohibited (except as otherwise provided) as per applicable laws.
7.	New wood based industry.	Establishment of new wood based industry shall not be permitted within the limits of Eco-sensitive Zone: Provided the existing wood-based industry may continue unless prohibited under any law for the time being force
8.	New encroachments and their regularization.	Encroachments of all kinds shall be prohibited.
9.	Lease out of submergence areas by irrigation department.	Total ban on lease for farming, fishing or any other activity in the submergence area, not related to the stated purpose (water supply & ancillary works thereto) of the lakes and tanks.
	Regulated Activities	
10.	Establishment of hotels and resorts.	No new commercial hotels and resorts shall be permitted, within one kilometer of the boundary of the Protected Area or the extent of Eco-sensitive Zone whichever is nearer, except related to eco-friendly tourism activities:

S. No.	Activity	Remarks
		Provided that beyond one km. from the boundary of the Sanjay Gandhi National Park area and up to the extent of the Eco-sensitive Zone, all new eco-tourism activities or expansion of existing activities shall be in conformity with the Zonal Master Plan.
11.	Construction activities.	Construction shall be permitted within the Eco-sensitive Zone as per the provisions of the approved Development Plan and other applicable rules and regulation under the Maharashtra Regional and Town Planning Act: Provided that the under construction/renovation of commercial buildings including group housing societies, offices, and services such as Information Technology/Information Technology Enabled Services, Parks, Roads, Power Transmission lines and cables, Telecommunication Towers and cables, Sewage lines, civic amenities, etc., and new construction projects such as Mumbai Metro Rail Shed, and creation of new civic amenities such as water supply related infrastructure and facilities and Operation & Maintenance of infrastructure, facilities of civic amenities sanctioned by concerned Local Self Government under approved Development Plan under the Maharashtra Regional and Town Planning Act, may be permitted within ESZ subject to applicable rules and regulations. Provided further that commercial redevelopment, reconstruction, repairs of existing structures which includes group housing societies, sanctioned by concerned Local Self Government under approved Development Plan under the Maharashtra Regional and Town Planning Act, may be allowed within Eco-sensitive Zone subject to applicable rules and regulations: Provided further that the commercial redevelopment reconstruction, repairs of existing structures which includes group housing societies, sanctioned by concerned Local Self Government under approved Development Plan under the Maharashtra Regional and Town Planning Act, may be allowed within the Eco-sensitive Zone subject to applicable rules and regulations. The construction activity related to small scale industries not causing pollution shall be permitted as per applicable rules and regulations, if any, with the prior permission from the competent authority. The Approved Development Plan shall be in conformity with the Zonal Master Plan taking into consideration the conservation aspects of the Eco-sensitive Zone.
12.	Felling of trees.	There shall be no felling of trees on the forest or Government or revenue or private lands without prior permission of the competent authority in the State Government.

S. No.	Activity	Remarks
		The felling of trees shall be regulated in accordance with the provisions of the concerned Central or State Act and the rules made thereunder.
13.	Commercial water resources including ground water harvesting.	The extraction of surface water and ground water shall be permitted only for bona fide agricultural use and domestic consumption of the occupier of the land. Extraction of surface water and ground water for industrial or commercial use including the amount that can be extracted, shall require prior written permission from the concerned regulatory authority: The construction activities of water supply infrastructure facilities of Municipal Corporation/Council related to maintenance, rehabilitation and augmentation are permitted. No extraction of surface water or ground water shall be permitted; however sale of bottled water, water in containers and tankers for the requirement as applicable shall be permitted. Steps shall be taken to prevent contamination or pollution of water from any source including agriculture.
14.	Erection of electrical cables and telecommunication towers.	Regulated as per applicable laws. Construction/Augmentation and renovation of Power Transmission lines and cables, Telecommunication Towers and cables is permitted. New underground cabling is promoted.
15.	Fencing of existing premises of hotels and lodges.	Regulated as per applicable laws. A tall fence shall be erected over the existing boundary wall of the Sanjay Gandhi National Park.
16.	Widening and strengthening of existing roads, bridges, infrastructure and construction of new roads, public utility or community buildings.	Shall be done as per applicable laws to these activities without adverse impact within the Eco-sensitive Zone.
17.	Movement of vehicular traffic at night.	Regulated for commercial purpose under applicable laws.
18.	Introduction of exotic species.	Regulated as per applicable laws.
19.	Protection of hill slopes and river banks.	Regulated as per applicable laws.
20.	Discharge of treated effluents in natural water bodies or land area.	Recycling of treated effluent shall be encouraged and for disposal of sludge or solid wastes shall be in accordance with the applicable regulations
21	Commercial Sign boards and hoardings.	Regulated as per applicable laws.
22.	Small scale industries not causing pollution.	Non-polluting, non-hazardous, small-scale and service industry, agriculture, floriculture, horticulture or agro-based industry producing products from indigenous goods from the Eco- Sensitive Zone, and which do not cause any adverse impact on environment shall be permitted.

S. No.	Activity	Remarks
23.	Collection of Forest produce or Non-Timber Forest Produce (NTFP).	No collection centre shall be permitted within hundred metres from the boundary of Wild Life Sanctuary or National Park
24	Air and vehicular pollution.	Regulated as per applicable laws.
25	Use of polythene bags by shopkeepers.	Regulated as per applicable laws.
26.	Drastic Change of Agriculture systems.	Regulated as per applicable laws.
27.	Commercial use of firewood.	Regulated (except as otherwise provided) as per applicable laws.
28.	Undertaking activities related to tourism such as over-flying the National Park Area by aircraft, hot-air balloons, drones, etc.	Regulated (except as otherwise provided) as per applicable laws.
29.	Solid Waste Management.	Regulated (except as otherwise provided) as per applicable laws.
30.	Eco-Tourism.	Regulated (except as otherwise provided) as per applicable laws.
Promoted Activities		
31.	Ongoing agriculture and horticulture practices by local communities along with dairies, dairy farming, aquaculture and fisheries.	Permitted under applicable laws
32.	Rain water harvesting.	Shall be actively promoted.
33.	Organic farming.	Shall be actively promoted.
34.	Adoption of green technology for all activities.	Shall be actively promoted.
35.	Cottage industries including village industries, convenience stores, local amenities, public utility and community buildings.	Shall be actively promoted.
36.	Use of renewable energy sources.	Bio gas, solar light etc. to be promoted
37.	Agro-Forestry.	Shall be actively promoted
38.	Skill Development.	Shall be actively promoted
39.	Environment Awareness.	Shall be actively promoted

5. Monitoring Committee.— (1) The Central Government for effective monitoring of the Eco-sensitive Zone, hereby constitutes a Monitoring Committee, which shall comprise of the following, namely:-

(a) Municipal Commissioner/ Additional Municipal Commissioner, Municipal Corporation of Greater Mumbai (MCGM). - Chairman

(b) Chief Conservator of Forests and Director, Sanjay Gandhi National Park. - Member

(c)	Additional Municipal Commissioner, Municipal Corporation of Thane	-	Member
(d)	Deputy Collector Mumbai Suburban District.	-	Member
(e)	Deputy Collector, Thane District		Member
(f)	Deputy Collector, Palghar District	-	Member
(g)	One representative of Non Governmental Organisation working in the field of environment to be nominated by the Government of Maharashtra for a term of one year in each case.	-	Member
(h)	One expert in the area of ecology and environment to be nominated by the Government of Maharashtra	-	Member
(i)	Regional Officer, Maharashtra State Pollution Control Board, Mumbai/Thane.	-	Member
(j)	Town Planning Officer, Mumbai/Thane/Palghar.	-	Member
(k)	Assistant Conservator of Forest (L.R.P.) Thane.	-	Member
(l)	Member of State Biodiversity Board	-	Member
(m)	Deputy Conservator of Forests, Thane Forest Division	-	Member Secretary

6. Terms of Reference

(a) The Monitoring Committee shall monitor the compliance of the provisions of this notification.

(b) The tenure of the Monitoring committee is for three (3) years.

(c) The activities that are covered in the Schedule to the notification of the Government of India in the erstwhile Ministry of Environment and Forest number S.O. 1533(E), dated the 14th September, 2006, and are falling in the Eco-sensitive Zone, except for the prohibited activities as specified in the Table under paragraph 4 thereof, shall be scrutinized by the Monitoring Committee based on the actual site-specific conditions and referred to the Central Government in the Ministry of Environment, Forests and Climate Change for prior environmental clearances under the provisions of the said notification.

(d) The activities that are not covered in the Schedule to the notification of the Government of India, Ministry of Environment and Forest and Climate Change number S.O. 1533 (E), dated the 14th September, 2006 and are falling in the Eco-sensitive Zone, except for the prohibited activities as specified in the Table under paragraph 4 thereof, shall be scrutinised by the Monitoring Committee based on the actual site-specific conditions and referred to the concerned regulatory authorities.

(e) The Member Secretary of the Monitoring Committee or the concerned Collector(s) or the concerned Forest Officers shall be competent to file complaints under section 19 of the Environment (Protection) Act, 1986 against any person who contravenes the provisions of this notification.

(f) The Monitoring Committee may invite representatives or experts from concerned Departments, representatives from Industry Associations or concerned stakeholders to assist in its deliberations depending on the requirements on issue to issue basis.

(g) The Monitoring Committee shall submit the annual action taken report of its activities as on 31st March of every year by 30th June of that year to the Chief Wildlife Warden of the State as per pro forma given in **Annexure IV.**

(h) The Central Government in the Ministry of Environment, Forest and Climate Change may give such directions, as it deems fit, to the Monitoring Committee for effective discharge of its functions.

7. The Central Government and State Government may specify additional measures, if any, for giving effect to provisions of this notification.

8. The provisions of this notification are subject to the orders, if any, passed, or to be passed, by the Hon'ble Supreme Court of India or the High Court or National Green Tribunal (NGT).

Annexure I

A. **Description of Boundaries of proposed Eco-sensitive Zone of Sanjay Gandhi National Park**

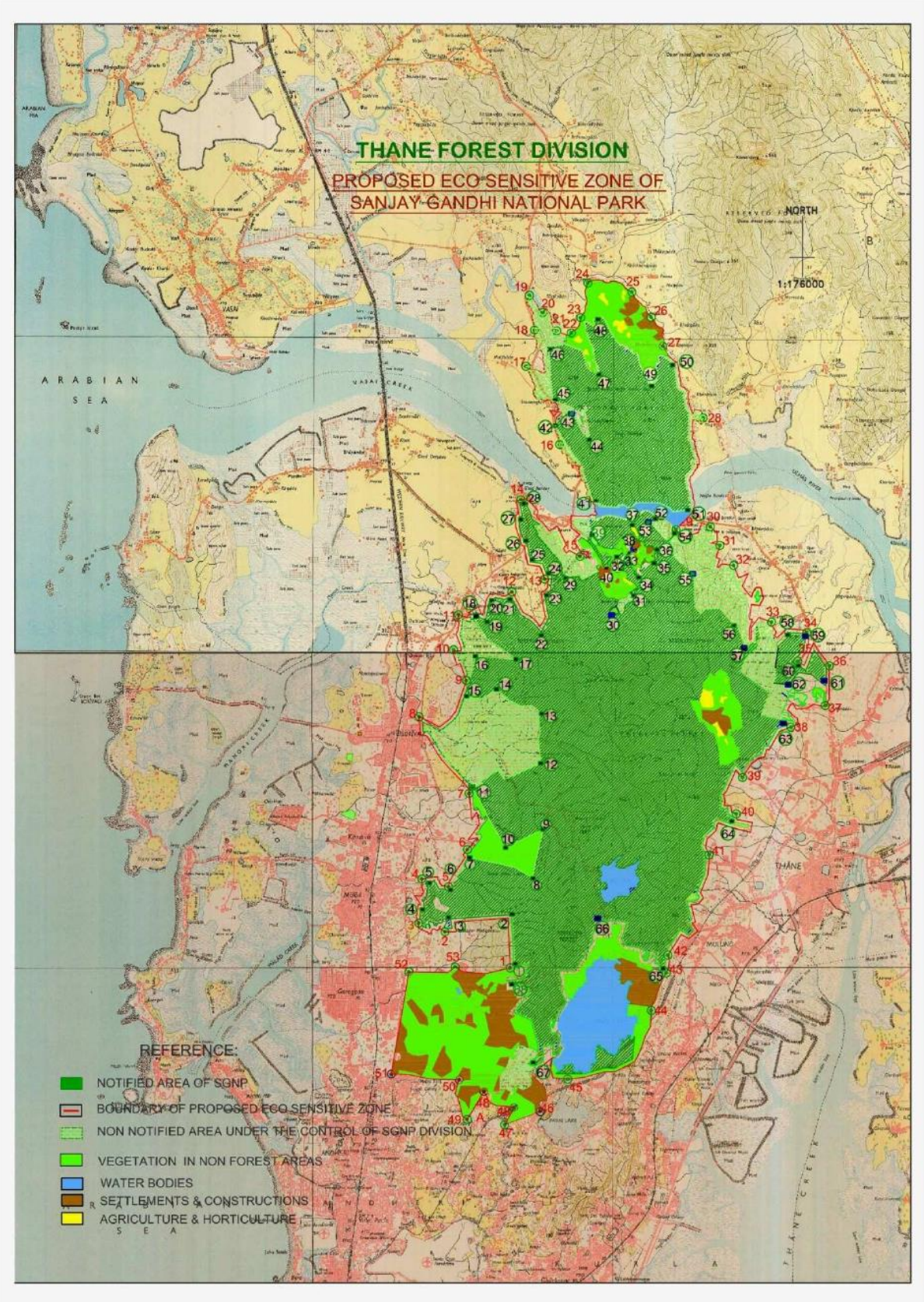
Direction	Bounded by
North	Boundary of Sasunavghar (Malji pada) Nala. [Latitude 19020'48.91"N] [Longitude 72053'32.47"E]
East	Boundary of Nagle (pt), Owala (pt.), Borivade (pt.) Vadavali (pt.), Kavesar (pt), Kolshet (pt.), Manpada (pt.), Majiwada (pt.), Pachpakhadi (Pt.), Mulund (Pt.), Nahur (Pt.), Clerabad (Pt.), Vihar. [Latitude 19014'39.38"N] [Longitude 72053'11.73"E]
South	Area of Aarey Dairy Division Boundary, Villages Sai (Pt.). [Latitude 19007'45.13"N] [Longitude 72052'46.89"E]
West	Area of Aarey Dairy Division Boudary, Malad (Pt.), Akurli (pt.), Poisar (Pt.), Magathane (Pt.), Kanheri (Pt.), Dahisar(Pt.), Kashi (Pt.), Mira (Pt.), Ghodbunder (Pt.), Varsave (Pt.), Sasunavghar (Pt.) [Latitude 19013'53.22"N] [Longitude 72051'45.76"E]

B. GPS readings of the Location points on the Boundary of Notified Area of the Sanjay Gandhi National Park,

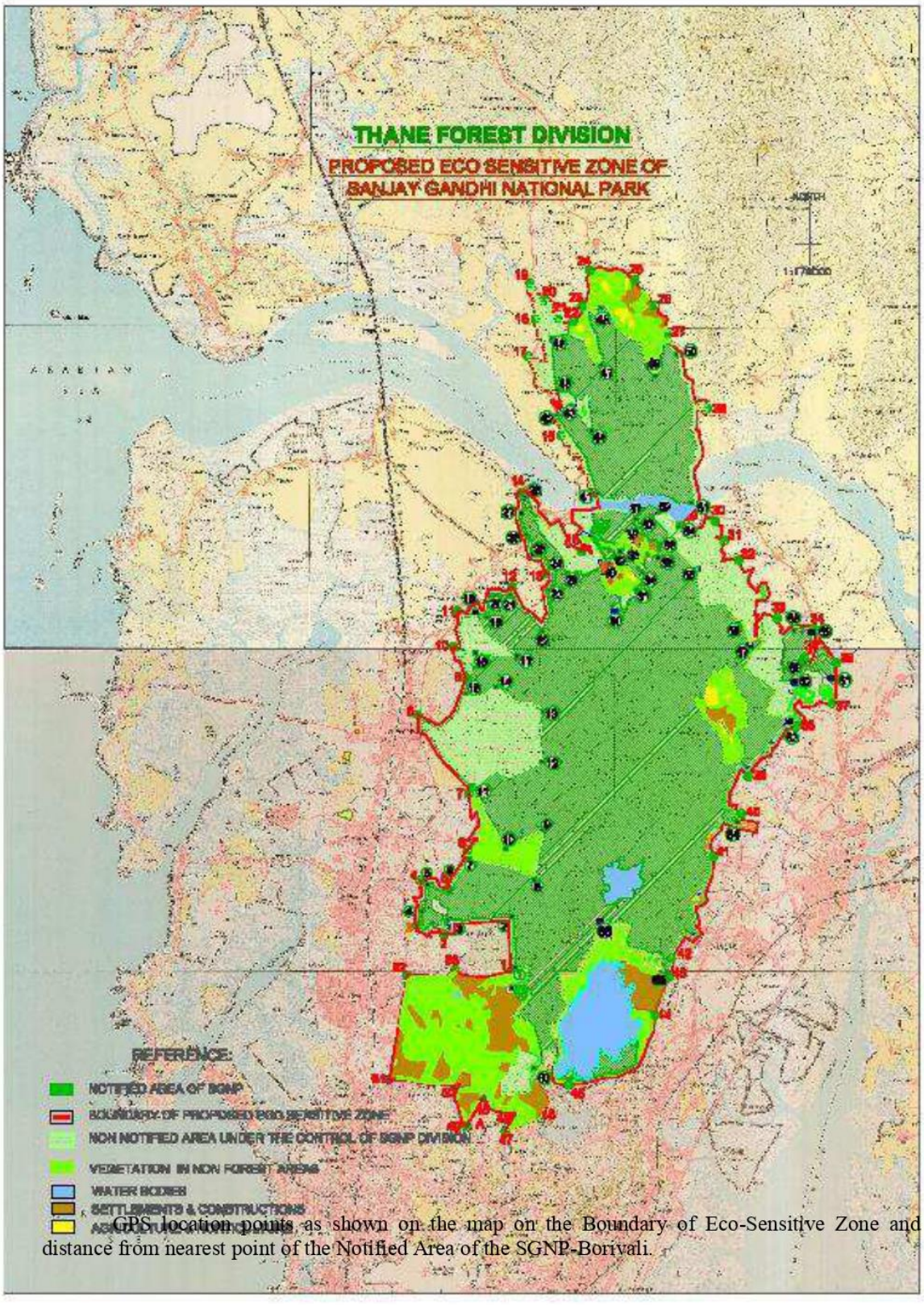
Point No.	Latitude (North)	Longitude (East)
1	19°10'8.16"	72°53'24.20"
2	19°10'54.76"	72°53'21.39"
3	19°10'52.86"	72°52'24.25"
4	19°11'3.42"	72°51'57.48"
5	19°11'29.34"	72°52'11.50"
6	19°11'16.29"	72°52'28.47"
7	19°11'39.98"	72°52'37.72"
8	19°11'27.68"	72°53'37.85"
9	19°12'15.25"	72°53'47.49"
10	19°11'59.78"	72°53'10.39"
11	19°12'49.65"	72°52'53.93"
12	19°13'19.23"	72°53'46.01"
13	19°14'6.58"	72°53'47.26"
14	19°14'30.32"	72°53'2.28"
15	19°14'24.12"	72°52'29.69"
16	19°15'2.33"	72°52'41.47"
17	19°14'58.68"	72°53'22.63"
18	19°15'36.10"	72°52'41.70"
19	19°15'37.22"	72°52'50.51"
20	19°16'1.54"	72°52'58.31"
21	19°16'5.97"	72°53'10.06"
22	19°15'26.30"	72°53'45.42"
23	19°16'17.91"	72°53'50.70"

Point No.	Latitude (North)	Longitude (East)
24	19°16'45.43"	72°53'28.84"
25	19°16'57.91"	72°53'23.54"
26	19°17'11.76"	72°53'25.25"
27	19°17'11.02"	72°53'33.71"
28	19°17'35.83"	72°53'25.07"
29	19°16'11.23"	72°54'17.76"
30	19°15'52.51"	72°55'11.79"
31	19°16'9.14"	72°55'26.93"
32	19°16'36.03"	72°55'2.82"
33	19°16'41.23"	72°55'15.57"
34	19°16'22.88"	72°55'24.78"
35	19°16'34.36"	72°55'42.66"
36	19°16'47.70"	72°55'44.04"
37	19°17'7.19"	72°55'16.90"
38	19°16'43.05"	72°55'18.63"
39	19°17'5.25"	72°54'34.73"
40	19°16'25.43"	72°54'50.96"
41	19°17'27.38"	72°54'40.61"
42	19°18'42.31"	72°53'57.51"
43	19°19'0.11"	72°54'12.05"
44	19°18'34.46"	72°54'30.47"
45	19°19'8.68"	72°53'56.70"
46	19°20'3.00"	72°53'50.52"
47	19°19'36.40"	72°54'40.11"
48	19°20'28.82"	72°54'38.73"
49	19°19'23.77"	72°55'34.30"
50	19°19'44.11"	72°55'58.89"
51	19°17'22.34"	72°56'13.89"
52	19°17'18.29"	72°55'37.79"
53	19°16'49.75"	72°55'45.22"
54	19°17'7.38"	72°56'1.54"
55	19°16'15.25"	72°56'19.81"
56	19°15'17.36"	72°57'3.70"
57	19°14'24.40"	72°57'40.96"
58	19°15'21.93"	72°57'36.87"
59	19°15'33.26"	72°58'10.71"
60	19°14'50.47"	72°58'3.69"
61	19°14'30.88"	72°58'29.70"
62	19°14'8.58"	72°57'32.63"
63	19°13'55.19"	72°57'53.22"
64	19°12'21.27"	72°56'58.75"
65	19° 9'58.36"	72°55'43.04"
66	19°10'52.55"	72°54'41.24"
67	19° 8'32.17"	72°53'37.74"
68	19° 9'49.24"	72°53'22.17"

Anne


THANE FOREST DIVISION
PROPOSED ECO SENSITIVE ZONE OF
SANJAY GANDHI NATIONAL PARK
NORTH
1:176000
ARABIAN SEA
REFERENCE:
NOTIFIED AREA OF SGNP
BOUNDARY OF PROPOSED ECO SENSITIVE ZONE
NON NOTIFIED AREA UNDER THE CONTROL OF SGNP DIVISION
VEGETATION IN NON FOREST AREAS
WATER BODIES
SETTLEMENTS & CONSTRUCTIONS
AGRICULTURE & HORTICULTURE
THANE

Map of proposed Eco-sensitive Zone



GPS location points as shown on the map on the Boundary of Eco-Sensitive Zone and it distance from nearest point of the Notified Area of the SGNP-Borivali.

GPS location points as shown on the map on the Boundary of Eco-Sensitive Zone and its distance from nearest point of the Notified Area of the SGNP-Borivali.

Sr. No.	Latitude (North)	Longitude (East)	Notified Boundary To ESZ
	(° ' '')	(° ' '')	Distance in meters
1	19°10'7.33"N	72°53'20.36"E	100
2	19 10 42.01	72 52 21.82	100
3	19 10 41.65	72 51 56.55	100
4	19 11 27.24	72 51 59.99	100
5	19 11 20.03	72 52 24.92	100
6	19 12 03.61	72 52 44.92	530
7	19 12 33.41	72 52 38.67	507
8	19 14 01.10	72 51 51.00	1315
9	19 14 41.89	72 52 28.62	100
10	19 15 04.87	72 52 26.54	445
11	19 15 34.25	72 52 28.24	400
12	19 16 09.27	72 53 09.77	100
13	19 16 17.51	72 53 47.27	100
14	19 17 38.17	72 53 22.57	400
15	19 16 35.7	72 54 21.79	430
16	19°18'44.12"N	72°53'54.18"E	100
17	19 19 42.19	72 53 36.70	465
18	19 20 08.69	72 53 43.42	270
19	19 20 48.96	72 53 32.00	1506
20	19 20 32.48	72 53 42.83	918
21	19 20 37.33	72 53 49.27	1029
22	19 20 14.17	72 54 02.26	300
23	19 20 16.55	72 54 19.91	232
24	19 20 40.08	72 54 31.92	400
25	19 20 56.58	72 55 11.92	1065
26	19 20 30.07	72 55 35.20	1234
27	19 20 04.68	72 55 47.52	755
28	19°18'57.47"N	72°56'23.32"E	260
29	19 17 13.36	72 55 50.05	278
30	19 16 54.85	72 56 14.70	335
31	19 17 02.18	72 56.35.87	1050
32	19 16 25.52	72 57 02.91	1300
33	19 15 30.43	72 57 22.05	500

34	19 15 31.11	72 58 06.74	100
35	19 14 59.98	72 58 06.68	100
36	19 14 44.52	72 58 29.48	100
37	19 14 15.97	72 58 14.68	610
38	19 13 49.34	72 57 51.14	100
39	19 13 10.04	72 57 12.78	100
40	19 12 28.47	72 57 03.00	100
41	19 11 49.28	72 56 35.04	100
42	19 09 54.26	72 55 46 .88	100
43	19 09 53.97	72 55 42.13	133
44	19° 9'30.55"N	72°55'36.69"E	862
45	19 08 22.37	72 54 07.46	100
46	19 08 07.10	72 53 52.00	880
47	19 07 45.34	72 53 11.68	1618
48	19 08 01.73	72 53 20.47	1053
48A	19 08 16.61	72 52 51.16	1430
49	19 07 50.02	72 52 35.15	2225
50	19 08 26.73	72 52 26.93	2060
51	19 08 31.42	72 51 19.31	4000
52	19 10 10.93	72 51 34.02	3216
53	19 10 04.35	72 52 15.28	2011

Annexure-III

A. List of village/township, inside the Eco-sensitive Zone along with 'Lat-Long' with respect of the Protected Area (Coordinates of at least one point therein)

S. No.	**Villages**	**Latitude (North)**	**Longitude**
1	Tusli Lake in village Tulsi	19° 11' 25.99"	72° 55' 00.72"
2	Clerabad	19° 09' 59.11"	72° 55' 42.14"
3	Mulund	19°10' 47.09"	72°56' 19.99"
4	Nahur	19°10' 02.33"	72°55' 52.84"
5	Gundgoan (Vihar Lake)	19° 10' 10.59"	72° 55' 19.52"
6	Vihar (Vihar Lake)	19° 08' 45.58"	72° 55' 22.43"
7	Kanjur	19° 08' 32.66"	72° 55' 13.80"
8	Paspoli	19° 08' 19.32"	72° 54' 26.38"
9	Saie	19° 08' 22.89"	72° 54' 31.23"
10	Area of Aarey (Dairy Development Division)	19° 09' 59.24"	72° 51' 31.90"
11	Aarey	19° 10' 04.75"	72° 52' 31.31"

S. No.	Villages	Latitude (North)	Longitude
12	Marol (Moroshi)	19° 08' 22.27"	72° 53' 37.37"
13	Malad	19° 10' 50.99"	72° 52' 54.28"
14	Akurli	19° 11' 51.86"	72° 52' 42.88"
15	Poisar	19° 12' 45.92"	72° 52' 37.54"
16	Kandivali	19° 12' 28.52"	72° 50' 38.93"
17	Magathane	19° 13' 07.72"	72° 52' 23.75"
18	Kanheri	19° 13' 52.58"	72° 51' 45.53"
19	Shimpoli	19° 13' 10.14"	72° 50' 45.17"
20	Borivali Tarf Malad	19° 14' 07.70"	72° 50' 15.02"
21	Dahisar	19° 14' 16.12"	72° 52' 22.34"
22	Kashi	19° 15' 43.13"	72° 52' 48.54"
23	Mira	19° 15' 27.70"	72° 53' 47.65"
24	Ghodbunder	19° 17' 31.44"	72° 53' 22.10"
25	Varsava	19° 16' 37.12"	72° 54' 24.26"
26	Chene	19°16' 28.17"	72°55' 01.30"
27	Owala (Old Village - including new village (Bhayanderpada)	19°17' 06.44"	72°56' 23.27"
28	Vadavali	19°15' 28.32"	72°57' 18.84"
29	Borivade	19°15' 24.04"	72°57' 35.51"
30	Kavesar	19°15' 33.30"	72°57' 55.78"
31	Kolshet	19°14' 58.33"	72°58' 28.02"
32	Manpada	19o14' 13.46"	72°58' 26.87"
33	Majiwada	19o13' 43.89"	72°57' 43.25"
34	Pachpakhadi	19°12' 15.06"	72°57' 15.79"
35	Yeur	19° 14' 01.49"	72° 56' 40.71"
36	Sasunavghar	19° 19' 15.85"	72° 53' 37.82"
37	Mori	19° 20' 53.73"	72° 54' 35.26"
38	Poman	19° 20' 22.36"	72° 55' 42.07"
39	Kaman	19° 20' 59.72"	72° 54' 56.78"
40	Shilottar	19° 20' 00.32"	72° 55' 46.02"
41	Nagale	19° 18' 57.18"	72° 56' 23.63"

B. Villages and survey numbers with its area included in the Eco-sensitive Zone

Sl. No.	Taluka	Name of Villages	Eco-sensitive Zone				Total (Ha.)
			Private Land Survey No.	**Private Land (Ha.)**	Forest land Survey no.	**Forest Area (Ha.)**	
1	Kurla	Mulund	377/351pt, 380pt, 247pt, 232pt, 247pt, 248pt, 249pt, 251pt, 250pt, 245pt.	**18.5900**	377/351pt	**2.8000**	**21.3900**
2		Nahur	150pt (17Apt), 147pt, 146pt, 155pt, 176/148, 165, 167.	**15.6800**	177/148pt	**2.8730**	**18.5530**
3	Borivali	Gundgoan (Vihar Lake)	Vihar Lake.	**293.1100**	124pt,	**45.5270**	**338.6370**
4		Vihar (Vihar Lake)	61, 62, 63, 58, Vihar Lake.	**510.7900**			**510.7900**
5		Area of Aarey Dairy Division & areas handed by Aarey to other State Departments	-	**1114.7400**			**1114.7400**
6	Borivali	Area of the Filmcity - Maharashtra Film, Stage and Cultural Development Department. (under village Aarey-pt, Saei- pt & Gundgaon pt)	1/1, 1/3 pt, 1/4pt, 188pt (124pt), 19pt.	**210.8300**			**210.8300**
7	Andheri	Marol (Moroshi)	169	**97.0000**	CTS Nos.	**76.0000**	**173.0000**
8	Borivali	Saie	162, 168, 6, 7, 160, 118pt, 8, 179, 9, 10, 128, 19, 18, 5, 169, 12, 15, 170, 17, 16, 173, Lake.	**137.3100**	19pt	**3.3150**	**140.6250**
9		Clerabad	55,56.	**10.6817**	57pt	**0.3950**	**11.0767**
10		Malad	239/1pt, 269, 267pt, 271, 272, 253pt, 273pt, 274pt, 275pt, 276, 277pt, 278pt, 237pt, 221pt, 227pt, 226pt, 224, 223pt, 234, 222pt, 225pt, 228pt, 233pt, Kurar village part area.	**95.1200**			**95.1200**
11		Akurli	88pt, 86pt, 87A-pt.	**17.2300**	87A-pt	**99.7090**	**116.9390**
12		Poisar	41pt, 42Apt.	**16.1200**	42/A-pt, 46	**119.4910**	**135.6110**

Sl. No.	Taluka	Name of Villages	Eco-sensitive Zone				Total (Ha.)
			Private Land Survey No.	**Private Land (Ha.)**	Forest land Survey no.	**Forest Area (Ha.)**	
13		Magathane	148pt, 80, 88pt, 99pt, 98pt, 97pt, 96pt, 105pt, 95pt, 94pt, 57pt, 58pt, 50pt, 34pt, 47pt, 48pt, 89pt, 34B-pt.	**26.2800**	34B-pt	**575.3310**	**601.6110**
14		Kanheri	17pt, 16pt, 18Apt, 18B, 19pt, 21pt, 10pt, 97pt, 20pt, 9pt.	**19.7700**	11, 12, 13, 14, 15.	**12.6060**	**32.3760**
15		Dahisar	345C-pt, 210pt, 211pt, 164pt, 163pt, 151pt, 149pt, 147pt, 146pt, 101pt, 100pt, 99pt, 98pt.	**39.7400**	345A-pt	**87.8330**	**127.5730**
16	Thane	Kashi	89pt, 83pt, 82,79pt, 80, 90pt, 103pt, 77pt, 69pt, 68pt, 66pt, 58pt, 65, 64pt, 61pt, 62, 100pt, 101, 60, 55pt, 96pt, 102pt, 54pt, 52pt, 104pt, 53,63, 47pt, 67pt, 43pt, 44pt, 45pt, 94pt, 50pt.	**34.0900**			**34.0900**
17		Mira	95pt, 96pt, 94pt, 93pt, 92, 85pt, 84pt, 83pt, 79pt, 78pt, 77pt, 76pt, 69pt, 68pt, 67pt, 66pt, 65pt, 98pt, 70.	**23.0000**			**23.0000**
18		Ghodhunder	Khadi part, 244, 205, 241pt, Gavthan, Gavthan (pt) 236, 235, 237, 202, 203pt, 200, 240, 198, 14pt, 17pt, 18pt, 19pt, 191, 193pt, 188, 187pt, 186, 184, 183pt, 185pt, 177, 178pt, 215, 176pt, 174pt, 173, 216pt, 182pt, 180pt.	**38.0400**	217 pt	**0.5570**	**38.5970**
19		Versava	5pt, 6, 7, 10, 9pt, 11, 13, 14, 15, 16pt, 2, Gavthan, 109pt, 105pt, 106, 107, 108, 103, 102, 101pt, 91, 88, 89 , 90, 87pt, 85pt, 86, 80pt, 78, 79, 77, 69, 68, 67, 66, 65, 72pt, 70, 71, 58, 62, 63, 64, 61, 57, 59, 60, 56pt, 52pt, 53pt, 54pt, 34pt, 21pt, 36pt, 35pt, 42pt, 27pt, 28, 29, 30.	**58.6500**	3pt, 34pt, 31, 32pt, 33pt.	**102.0840**	**160.7340**
20		Chene	Whole Area.	**185.3700**	101pt, 9pt,	**13.9150**	**199.2850**
21		Owala	Khadi part, 296, 286, 287, 288, 291pt, 285pt, 274pt,	**92.6500**	120/11, 273/3, 273/5,	**415.1470**	**507.7970**

Sl. No.	Taluka	Name of Villages	Eco-sensitive Zone				Total (Ha.)
			Private Land Survey No.	**Private Land (Ha.)**	Forest land Survey no.	**Forest Area (Ha.)**	
			273pt, 275pt, 276pt, 268pt, 269pt, 271, 272pt, 250pt, 245pt, 244, 243pt, 241pt, 240, 238, 239, 162pt, 161pt, 124pt, 121pt, Lake, 251pt, 249pt, 247pt, 237pt. 119, 120/1-10, 122pt, 117pt, 118pt, 106pt, 115pt, 113pt, 124pt.		291, 297		
22		Vadavali	19pt.	**1.9100**			**1.9100**
23		Borivade	1/2, 1/1pt, 2/6, 2/5, 2/4, 2/3, 2/2, 2/1, 3pt, 4/2, 4/1, 4/3, 6/3pt, 5/2, 6/1, 6/2, 8/5pt, 8/4, 8/1pt, 74pt., 75pt., 78pt, 91/3, Gavthan, 91/1pt, 91/2pt, 92pt.	**11.5900**	83/1, 2, 4, 9, 10, 5/1, 84/1/1, 85/1/2, 86/1/2, 79, 80.	**136.8300**	**148.4200**
24		Kavesar	142, 143pt, 145pt, 154pt, 151pt, 147pt, 149, 150, 158pt, 159, 160, 161, 163pt, 162pt, 165pt, 166pt, 168pt, 170pt, 169pt, 196pt, 193pt, 185pt, 196, 197, 198, 141pt, 139pt, 146pt.	**42.0000**			**42.0000**
25		Kolshet	291pt, 100pt, 99pt, 114pt, 113pt, 112, 111pt, 110pt, 109/107, 108pt, 107, 106, 285pt.	**10.8400**			**10.8400**
26		Manpada	57/3, 57/1pt, 57/2, 59A/30/1pt, 59A/31pt, 59/32, 59/27, 58/1pt, 59B-pt, 59/1pt, 59/16pt, 59/18pt, 59/19pt, 59A/28pt, 59A/20, 59A/2, 59A/3, 59A/4, 59A/5, 59A/13, 59A/11pt, 70, 59A/10, 71,59/C, 59A/6, 59A/7, 59A/8, 59A/9.	**49.4054**	59/1pt	**68.1410**	**117.5464**
27		Majiwada	380pt, 254pt, 260pt, 261pt, 269, 263pt, 264pt, 268pt.	**66.8900**	419pt	**1.7200**	**68.6100**
28		Pachpakhadi	432pt, 431pt, 430pt, 423pt, Dheari nursary area, 263pt, 264pt, 265pt, 266pt, 267pt, 520pt, 373pt, 371pt, 270pt, 287pt, 288pt, 286pt, 285pt, 289pt, 291pt, nala area-pt, 163pt, 160pt, 159, 158pt.	**42.0000**	519pt, 520pt	**4.8350**	**46.8350**
29		Yeur	Whole Area.	**197.4530**	42/1, 14, 20,	**6.1690**	**203.6220**
30	Vasai	Sasunavghar	312/A/1/(80), 312pt, 249pt, Gavthan, 38(81),	**103.3200**	312pt, 249	**130.5810**	**233.9010**

Sl. No.	Taluka	Name of Villages	Eco-sensitive Zone				Total (Ha.)
			Private Land Survey No.	**Private Land (Ha.)**	Forest land Survey no.	**Forest Area (Ha.)**	
			Gavthan, 232(79), 244(77), 245(73), 248(76), 362pt, 251, 328, 68, 13(66), 12(67), 14(64), 16(65), 15(63), 17(62), 18(61), 374(60), 19(59), 11(69), 355(77), 21(78), 22(79), 23(80), 28(82), 26(83), 27(84), 24(81), 28(85), 32 (86), 33(88), 34(87), 35(91), 36(90), 37(92), 38(96), 39(97), 71(154), 72(157), 74(156), 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 21, 22, 23, Karnala pada 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57.				
31		Mori	Whole Area.	**164.5300**			**164.5300**
32		Poman	220, 188, 187, 217, Pada, 216, 212, 214, 185, 219, 249, 184, 183, 221, 222, 186, 181, 182, 17, 175, 176, 174, 179, 223, 178, 177, 211, 169, 173, 172, 171, 247, 170, pada, 168, 167, 163, 164, 160, 161, 162, 166, 165.	**79.1300**			**79.1300**
33		Kaman	99, 149, 148, 147.	**12.1400**			**12.1400**
34		Shilottar	5, 4, 3, 1pt, 21pt, 6.	**3.6300**			**3.6300**
35	Borivali	Shimpoli	-		20	**4.8460**	**4.8460**
36		Borivali Tarf Malad			143, 146, 147	**7.2490**	**7.2490**
37		Kandivali			164A	**0.7520**	**0.7520**
38		Tulsi	Lake	**120.0000**			**120.0000**
39		Nagle	7, 72pt, 6, 65pt, 92pt, 5, 4pt, 16pt, 15pt, 14pt, 21pt, 20pt, 70, 69, 22, 11, 67, 24pt, 10pt, 25pt, 29pt, 66, 30pt, 32pt, 33pt, 35pt, 34pt, 59pt, 37pt, 38pt, 39pt.	**39.3202**	23	**6.2625**	**45.5827**
40		Paspoli	22pt, 23pt.	**18.7100**			**18.7100**
41		Kanjur		**3.0000**			**3.0000**

Sl. No.	Taluka	Name of Villages	Eco-sensitive Zone				Total (Ha.)
			Private Land Survey No.	**Private Land (Ha.)**	Forest land Survey no.	**Forest Area (Ha.)**	
	Total			**4020.6603**		**1924.9685**	**5945.6288**
N.B.: 1. The above survey numberwise list is as per available village maps and records of the office of the DCF, Thane.							

ANNEXURE-IV

Performa of Action Taken Report: - Eco-sensitive Zone Monitoring Committee.—

1. Number and date of meetings :
2. Minutes of the meetings: mention main noteworthy points. Attach Minutes of the meeting as separate Annexure.
3. Status of preparation of Zonal master Plan including Tourism master Plan :
4. Summary of cases dealt for rectification of error apparent on face of land record : Details may be attached as Annexure
5. Summary of cases scrutinised for activities covered under the Environment Impact Assessment Notification, 2006: Details may be attached as separate Annexure.
6. Summary of cases scrutinised for activities not covered under the Environment Impact Assessment Notification, 2006: Details may be attached as separate Annexure.
7. Summary of complaints ledged under Section 19 of the Environment (Protection) Act, 1986 :
8. Any other matter of importance:

[F. No. 25/47/2014-ESZ-RE]

Dr. T. CHANDINI, Scientist 'G'

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10.3 ANNEXURE-III-SGNP Forest Notification

10.3.1 SGNP Forest Notification, 1996

APPENDIX - XXXIX

महाराष्ट्र शासन राजपत्र, फेब्रुवारी ८, १९९६/ माघ १९, शके १९१७ (भाग चार-अ)

REVENUE AND FORESTS DEPARTMENT
Mantralaya, Mumbai 400 032, Dated the 16th January, 1996.

28
WILDLIFE (PROTECTION) ACT, 1972.

No. WLP/1094/OR 177/F-I—Whereas by Government Notification, Revenue and Forests Department, No. PGS. 1081/131724/F-5, dated the 4th February 1983, issued under sub-sections (*1*) and (*2*) of section 35 of the Wildlife (Protection) Act, 1972 (53 of 1972), the Government of Maharashtra had declared its intention to constitute the area specified in the Schedule thereto appended as National park to be known as the "Sanjay Gandhi Rashtriya Udyan" and had defined the limits thereof ;

AND WHEREAS the period for preferring the claims has elasped and all claims made in relation to lands in the area intended to be declared as a National park to be known as "Sanjay Gandhi Rashtriya Udyan" have been disposed of by the State Government ;

AND WHEREAS all rights in respect of lands proposed to be included in the National Park to be known as "Sanjay Gandhi Rashtriya Udyan" have become vested in the State Government ;

NOW, THEREFORE, in exercise of the powers conferred by sub-section (*4*) of section 35 of the Wildlife (Protection) Act, 1972 (53 of 1972) the Government of Maharashtra hereby—

(a) specifies the limits of the area, as specified in Schedule appended hereto, which shall be comprised within the National park to be the known as "Sanjay Gandhi Rashtriya Udyan" ;
(b) declares that, on and from the date of publication of this specification in the *official Gazette*, the said area shall be a National Park to be known as "Sanjay Gandhi Rashtriya Udyan" .

SCHEDULE

Situation and limits of the Sanjay Gandhi Rashtriya Udyan, Borivali

Name of the villages included in the Sanjay Gandhi Rashtriya Udyan, Borivali.

Serial No.	Village	Survey Nos.	Area			
			A.	G.	As.	Hectares
(1)	(2)	(3)	(4-a)			(4-b)
(i) Revenue Villages of Thane District—						
1	Kashi	106	842	32	00	341.06873
2	Mira	260	339	31	00	137.50162
3	Ghodbunder	192,217,243	171	25	00	69.45392
4	Yewoor	106	3,131	20	00	1,267.27434

Party IC-A [400-8-2-96]-I

(1)	(2)	(3)	(4-a)			(4-b)
5	Majiwade	418,419,420	356	10	08	144.17422
6	Panchpakhadi	519,520,521	507	05	00	205.22658
7	Kavesar	156,291,292	321	31	00	130.21762
8	Kolshet	291	34	27	10	14.03875
9	Nagla	73	1,085	25	00	439.33722
10	Sarjamore	165	225	30	00	91.35751
11	Sasunavghar	385	2,861	05	00	1,157.85658
12	Shilottar	23	10	12	00	4.16825
13	Chene	7,8,10,27,28, 37,89,99,101	2,845	24	04	1,151.57633
14	Ovale	289	17	17	00	7.05167
15	Borivare	82,87,88	35	04	00	14.20447
		Total	**12,786**	**19**	**06**	**5,174.50781**

(ii) Revenue Villages of Bombay Suburban District—

1	Gundgaon	84, 120,124	1,199	03	13	485.25653
2	Sai	13,19,163,175	192	02	00	77.72022
3	Clearabad	54,57	54	15	04	22.00727
4	Mulund	356,357,374, 376,378	191	28	12	77.58586
5	Nahur	166,167,175, 177,148	156	11	00	63.24228
6	Tulsi	6	1,841	20	00	745.22930
7	Vihar	188	542	15	00	219.49175
8	Dahisar	345/B	365	00	00	147.71004
9	Akurli	87/B	49	23	00	20.06227
10	Poisar	42/B	355	21	04	224.81597
11	Magathane	34/B	2,707	08	06	1,095.56973
12	Malad	239/1	848	20	12	343.38291
		Total	8,703	09	03	3,522.07413

Total area of Thane and Bombay Suburban District included in Sanjay Gandhi Rashtriya Udyan, Borivali is 8,696.58194 hectares or 86.965 sq.km.

The Forest Ranges included in the Sanjay Gandhi Rashtriya Udyan, Borivali are as under

i) Sanjay Gandhi Rashtriya Udyan, Borivali Range.

ii) Yewoor Range.

10.4 ANNEXURE-IV-List of Flora in Pre-Monsoon and Post Monsoon Survey

10.4.1 List of Flora found in Pre-Monsoon Survey

Sr. No.	Common Name/Local Name	Botanical Name
1	Aapte	*Aapte*
2	Alba	*Himantanthus Bracteatus*
3	Apta	*Bauhinia Racemosa*
4	Arrowleaf Elephant Ear	*Xanthosoma Sagittifolium*
5	Badam	*Termialia Catappa*
6	Bamboo	*Bambusa Vulgaris*
7	Banyan Tree	*Ficus Benghalensis*
8	Bhandhari	*Anticharis Senegalensis*
9	Black Nightshade	*Solanum Nigrum*
10	Blue Eranthemum	*Eranthemum Roseum*
11	Blue Mistflower	*Conoclinium Coelestinum*
12	Boat Lily	*Tradescantia Spathacea*
13	Bodhi Tree	*Ficus Religiosa*
14	Bogenvel	*Bogenvel*
15	Buffel Grass	*Cenchrus Ciliaris*
16	Cabbage Palm	*Sabal Mexicana*
17	Caesarweed	*Urena Lobata*
18	Cashew	*Anacardium Occidentale*
19	Castor Oil Plant	*Ricinus Communis*
20	Chafa	*Plumeria Alba*
21	Chiku	*Manilkara Zapota*
22	Chinese Ladder Brake.	*Pteris Vittata*
23	Chinese Mustard	*Brassica Juncea*
24	Cocoa	*Gliricidi Sepium*
25	Coconut	*Cocus Nucifera*
26	Copper Pod	*Peltophorum Pterocarpum*
27	Coral Vine	*Antigonon Leptopus*
28	Creeping Dayflower	*Commelina Diffussa*
29	Devil'S Backbone	*Euphorbia Tithymaloides*
30	Drumstick	*Moringa Oleifera*
31	Dwarf Cavendish Banana	*Musa Acuminata*
32	Eucalyptus	*Eucalyptus Globus*
33	False Ashoka	*Polyalthia Longifolia*
34	False Ashoka	*Monoon Longifolium*
35	Fig	*Ficus Carica*
36	Firecracker Flower	*Crossandra*
37	Fishtail Palm	*Caryota Mitis*
38	Florida Betony	*Stachys Floridana*
39	Ghaneri	*Lantana Camara*

Sr. No.	Common Name/Local Name	Botanical Name
40	Giant Milkweed	*Calotropis Gigantea*
41	Guava	*Psidium Guajava*
42	Gulmohar	*Delonix Regia*
43	Gumbo-Limbo	*Bursera Simaruba*
44	Hibiscus	*Hibiscus Rosa-Sinensis*
45	Horse Raddish	*Moringa Oleifera*
46	Indian Almond	*Terminalia Catappa*
47	Indian Banyan Tree	*Ficus Benghalensis*
48	Jackfruit	*Artocarpus Heterophyllus*
49	Jamun	*Syzygium Cumini*
50	Jangali Chaulai	*Amaranthus Viridis*
51	Jungli Jalebi	*Amaranthus Viridis*
52	Kapok Tree	*Ceiba Pentandra*
53	Karvand	*Carissa Carandas*
54	Katesavar	*Bombax Ceiba*
55	Kulikhara	*Asteracantha Longifolia*
56	Lantana Weed	*Lantana Camara*
57	Lightwood	*Acacia Implexa*
58	Limbu	*Citrus Limon*
59	Lvy Woodrose	*Merremia Hedercea*
60	Majestic Palm	*Ravenea Rivularis*
61	Malayan Tree Spurge	*Euphorbia Antiquroum*
62	Mango Tree	*Mangifera Indica*
63	Mehandi	*Lawsonia Inermis*
64	Mesquite	*Prosopis Spp*
65	Mexican Prickly Poppy	*Argemone Mexicana*
66	Ming Aralia	*Polyscias Balfouriana*
67	Morning Glory	*Ipomoea Obscura*
68	Mother Of Cocoa	*Gliricidia Sepium*
69	Nilgiri	*Eucalyptus Alba*
70	Nodeweed	*Synedrella*
71	Papaya Tree	*Carcia Papaya*
72	Papdi	*Dolichos Lablab*
73	Parthenium Weed	*Parthenium Hysterophorus*
74	Peepal Tree	*Ficus Religosa*
75	Peru	*Peru*
76	Pink Bogenvel	*Bougainvillea Glabra*
77	Purple-Heart Tradescantia	*Tradescantia Pallida*
78	Red Cotton Tree	*Bombax Ceiba*
79	River Tamarind	*Leucaena Leucocephala*
80	Seashell Devil'S Backbone	*Pedilanthus Tithymaloides*
81	Sessile Joyweed	*Alternanthera Sessilis*
82	Siam Weed	*Chromolaena Odorata*

Sr. No.	Common Name/Local Name	Botanical Name
83	Siam Wood	*Polycias Balfouriana*
84	Sickel Pod	*Cassia Tora*
85	Simpleleaf Chastetree	*Vitex Trifolia*
86	Sitafal	*Annona Squamosa*
87	Sonmohar	*Peltophorum Pterocarpum*
88	Spike Lavender	*Eucalyptus Globulus*
89	Sweet Almond	*Prunus Dulci*
90	Takla	*Cassia Tora*
91	Tamrind	*Tamarindus Indica*
92	Tapering Glade Fern	*Deparia Pycnosra*
93	Weeping Fig	*Ficus Benjamina*
94	White Bogenvel	*Bougainvillea Alba*
95	Yellow Oleander	*Cascabela Thevetia*

10.4.2 List of Flora found in Post-Monsoon Survey

Sr. No.	Common Name/ Local Name	Botanical Name
1	Aal Tree	*Morinda Citrifolia*
2	Andean Walnut	*Juglans Neotropica Diels*
3	Apapo, Ipado	*Lonchocarpus Sericeus*
4	Apta	*Bauhinia Racemosa*
5	Bamboo	*Bambusa Vulgaris*
6	Banana Tree	*Musa Acuminata Cavendish*
7	Bando Lata	*Spatholobus Parviflorus*
8	Bayan Tree,Fig	*Ficus Benghalensis*
9	Bitterbush	*Chromolaena Odorata*
10	Blue Trumpet Vine	*Thunbergia Laurifolia*
11	Bodhi Tree, Pimpal Tree	*Ficus Religiosa*
12	Broome Raintree	*Albizia Lebbeck*
13	Bush Clock Vine	*Thunbergia Erecta*
14	Cannonball Tree	*Couroupita Guianensis*
15	Cashew Nut Tree	*Anacardium Occidentale*
16	Castor Plant	*Ricinus Communis*
17	Cat'S Claw	*Dolichandra Unguis Cati*
18	Chal Chal	*Allophylus Edulis*
19	Champa Tree	*Plumeria Montana*
20	Chiku	*Manikara Zapota*
21	Chinch	*Tamarindus Indica*
22	Chinensis Ixora	*Ixora Chinensis*
23	Chitrak	*Plumbago Zeylanica*
24	Christ'S Thorn Jujube	*Ziziphus Spina -Christi*
25	Coast Cotton Wood	*Hibiscus Tilliaceus*
26	Coconut Tree	*Cocos Nucifera*

Sr. No.	Common Name/ Local Name	Botanical Name
27	Copper Pod	*Peltophorum Pterocarpum*
28	Cotton Morning Glory	*Ipomoea Cordatotriloba Dennst*
29	Croftonweed	*Ageratina Adenophora*
30	Crown Flower	*Calotropis Gigantea*
31	Devils Backbone	*Euphorbia Tithymaloides*
32	Dhobi Plant	*Mussaenda Philippica*
33	Dwarf Date Palm	*Phoenix Roebelenii*
34	East Inadian Walnut	*Albizia Lebbeck*
35	False Ashoka	*Monoon Longifolium*
36	Fan Palm	*Washingtonia Robusta*
37	Field Bindweed	*Convolvlus Sagittatus*
38	Flame Of The Forest	*Butea Monosperma*
39	Frywood,Koko	*Albizia Chinensis*
40	Giripushpa	*Gliricidia Sepium*
41	Guava	*Psidium Guajava*
42	Gulmohar	*Delonix Regia*
43	Hibiscus	*Hibiscus Rosa-Sinensis*
44	Hooker	*Cleistanthus Collinus*
45	Horseradish Tree	*Moringa Oleifera*
46	Indian Almond	*Terminalia Catappa*
47	Indian Camphorweed	*Pluchea Indica*
48	Indian Gooseberry	*Phyllanthus Acidus*
49	Indian Heliotrope	*Heliotropium Indicum*
50	Indian Jalap	*Operculina Turpethum*
51	Indian Tulip Tree,Portia Tree	*Thespesia Populnea*
52	Jackfruit	*Artocarpus Heterophyllus*
53	Jamun Tree,Java Plum	*Syzygium Cumini*
54	Japanese Morning Glory	*Ipomoea Nil*
55	Kadambo	*Acacia Auriculiformis*
56	Kaner	*Nerium Oleander*
57	Kapok Tree	*Ceiba Pentandra*
58	Karanja	*Pongamia Pinnata*
59	Kargol	*Sterculia Urens*
60	Katesver	*Bombax Ceiba*
61	Katsura	*Cercidiphyllum Japonicum*
62	Kawali	*Sterculia Urens*
63	Kharpat,Kakad	*Garuga Pinnata*
64	Kratom	*Mitragyna Speciosa*
65	Lal Bottle Brush	*Callistemon Citrinus*
66	Light Wood	*Acacia Implexa*
67	Lipstick Tree	*Bixa Orellana*
68	Lucky Nut Tree	*Thevetia Peruviana*
69	Madhumalti	*Combretum Indicum*

Sr. No.	Common Name/ Local Name	Botanical Name
70	Maiden Hair Fern	*Adiantum*
71	Mango Tree	*Mangifera Indica*
72	Manila Tamarind	*Pithecellobium Dulce*
73	Mesquite	*Prosopis Spp.*
74	Milkwood Pine	*Alstonia Scholaris*
75	Moringa	*Moringa Oleifera*
76	Moss Locust	*Robinia Hispida*
77	Mother Of Cocoa	*Gliricidia Sepium*
78	Mountain Ebony	*Bauhini Purpurea*
79	Neem	*Azadirachta Indica*
80	Nilgiri Tree	*Eucalyptus Rahman*
81	Norfolk Island Pine	*Araucaria Heterophylla*
82	Orchid	*Orchidaceae*
83	Papaya	*Carica Papaya*
84	Paperflower	*Bougainvillea Glabra*
85	Parijat	*Nyctanthes Arbor Tristis*
86	Peacock Flower, Momoqui.	*Caesalpinia Pluviosa*
87	Peepal	*Ficus Religiosa*
88	Piyasal, Pitsal	*Pterocarpus Marsupium*
89	Portia Tree	*Thespesia Populnea*
90	Quininetree	*Rauvolfia Caffra Sond.*
91	Red Cotton Tree	*Bombax Ceiba*
92	Red Cotton Tree	*Katesavar Bombax Ceiba*
93	Red Flag Bush	*Mussaenda Erythrophylla*
94	River Tamarind	*Leucaena Leucocephala*
95	Royal Bottle Palm	*Roystonea Regia*
96	Royal Palm	*Roystonea Regia*
97	Sadaphuli	*Catharanthus Roseus (L.) G.Don*
98	Sandbox Tree	*Hura Crepitans*
99	Scarlet Bell Flower	*Spathodea Campanulata*
100	Scarlet Creeper	*Ipomoea Hederifolia*
101	Scarlet Gourd	*Coccinia Grandis*
102	Sessile Joyweed	*Alternanthera Sessilis*
103	Shevga Tree	*Moringa Oleifera*
104	Silver Cock'S Comb	*Celosia Argentea*
105	Sitafal	*Annona Squamosa*
106	Spike Lavender	*Eucalyptus Globulus*
107	Star Pine	*Araucaria Heterophylla*
108	Sudan Teak	*Cordia Africana*
109	Tala, Tal Palm	*Borassus Flabellifer*
110	Tamarind,Chinch	*Tamarindus Indica*
111	Teak,Saag Tree	*Tectona Grandis*
112	Tivra Gandha	*Chromolaena Odorata*

Sr. No.	Common Name/ Local Name	Botanical Name
113	Toddy Palm	*Borassus Flabellifer L.*
114	Toothbrush Tree	*Salvadora Persica*
115	Tropical Spiderwort, Day Flower	*Commelina Benghalensis*
116	Tung Oil Tree	*Vernicia Fordii*
117	Umber	*Ficus Racemosa*
118	Valleybush Euphorbia	*Euphorbia Grandidens*
119	White Ash	*Fraxinus Americana L.*
120	White Morning Glory, Whitestar	*Lpomoea Lacunosa*
121	Wild Sage,Kongini	*Lantana Camara*
122	Wild Snake Gourd, Pointed Gourd	*Trichosanthes Sp.*
123	Yellow Trumpet Vine	*Thunbergia Laurifolia*

10.5 ANNEXURE-V- List of Fauna in Pre-Monsoon and Post Monsoon Survey

10.5.1 List of Fauna observed in Pre-Monsoon Survey

Sr. No.	Common Name/ Local Name	Species Name
1	Ashy Drongo	*Dicrurus Leucophaeus*
2	Asian Palm Swift	*Cypsiurus Parvus*
3	Asian Zebra Blue	*Leptotes Plinius Plinius*
4	Black-Hooded Oriole	*Oriolus Xanthornus*
5	Black-Rumped Flameback	*Dinopium Benghalense*
6	Blyth'S Reed Warbler	*Acrocephalus Dumetorum*
7	Buffalo	*Bubalus Bubalis*
8	Cat	*Felius Catus*
9	Common Leopard Butterfly	*Phalanta Phalantha*
10	Common Salior	*Neptis Hylas*
11	Cow	*Bos Taurus*
12	Crimson Marsh Glider	*Trithemis Aurora*
13	Crow	*Corvus*
14	Dog	*Indian Pariha Dog*
15	Eurasian Marsh-Harrier	*Eurasian Marsh-Harrier*
16	Glossy Ibis	*Plegadis Falcinellus*
17	Goat	*Capra Hircus*
18	Greater Coucal	*Centropus Sinensis*
19	Hens	*Gallus Gallus Domesticus*
20	Indian Paradise-Flycatcher	*Terpsiphone Paradisi*
21	Indian Wanderer	*Parernoia Hippa*
22	Jewel Beetle	*Buprestidae*
23	Kite	*Haliastur Indus*
24	Long-Tailed Shrike	*Lanius Schach*
25	Moth	*Asoto Caricae*
26	Parrots	*Psittacula Krameri Manillensis*
27	Pied Bushchat	*Hirundo Smithii*
28	Pigs	*Sus Scrofa Domesticus*
29	Praying Mantis	*Hestiasula Brunneriana*
30	Ravens	*Corvus Corax*
31	Red Cotton Stainer	*Dysdercus Cingulatus*
32	Rock Pigeon (Blue Rock Pigeon)	*Columba Livia*
33	Roosters	*Gallus Gallus Domesticus*
34	Rufous Woodpecker	*Micropternus Brachyurus*
35	Salunki	*Acridotheres Tristis*
36	Signature Spider	*Argiope Aemula*
37	Spotted Dove	*Spilopelia Chinensis*
38	Spotted Owlet	*Athene Brama*
39	Tambat	*Psilopogon Haemacephalus*

Sr. No.	Common Name/ Local Name	Species Name
40	Western Yellow Wagtail	*Motacilla Flava*
41	White-Breasted Waterhen	*Amaurornis Phoenicurus*

10.5.2 List of Fauna observed in Post-Monsoon Survey

Sr. No.	Common Name/Local Name	Species Name
1	Buffalo	*Bubalus Bubalis*
2	Butterfly	*Cepora Nerissa Phryne*
3	Cat	*Felius Catus*
4	Common Sailor Butterfly	*Neptis Hylas*
5	Cow	*Bos Taurus*
6	Desi Duck	*Anas Platyrhynchos Domesticus*
7	Dog	*Indian Pariah Dog*
8	Hens	*Gallus Gallus Domesticus*
9	Indian Monkey	*Macaca Mulatta*
10	Intermediate Egret	*Ardea Intermedia*
11	Langur	*Semnopithecus Entellus*
12	Pagoda Ants	*Crematogaster Sp.*
13	Pig	*Sus Scrofa Domesticus*
14	Pigeon	*Columba Livia Domestica*
15	Ravens	*Corvus Corax*
16	Roosters	*Gallus Gallus Domesticus*
17	Signature Spider	*Argiope Anasuja*
18	Striped Tiger Butterfiy	*Danaus Genutia*
19	Zebra Swallowtail Butterfly	*Eurytides Marcellus*

10.6 ANNEXURE-VI-List of CTS/Survey numbers[11] in various identified prohibited activities

10.6.1 List of CTS/ Survey numbers in Prohibited Activities – Industrial

10.6.1.1 List of CTS numbers in Prohibited Activities – Industrial – BMC

Sr. No.	Ward	Name of Location	CTS Number	Type	Estimated Area (Sq.M)
1	R/North	Konkani Pada, Dahisar East	2330A/1/1(Pt), 2437(Pt).	RMC Plant	12981.20
2	P/South	Aarey, Jogeshwari East	258(Pt).	RMC Plant	18,479.70
3	K/E	Prajapur	1(Pt)	Bakery	3748.62
	P/S	Aarey	258(Pt)		1414.81

10.6.1.2 List of Survey numbers in Prohibited Activities – Industrial – MBMC

Sr. No.	Village	Survey Number	Type	Estimated Area (Sq.M)
1	Ghodbunder	14(Pt)	RMC	1857.328
2	Ghodbunder	15(Pt)	RMC	1019.357
3	Ghodbunder	18(Pt), 18(Pt), 17(Pt)	RMC	8769.421
4	Chene	146(Pt), 150(Pt), 151, 124, 121, 111, 122, 116(Pt), 114(Pt), 115(Pt), 123(Pt), 113(Pt), 105(Pt), 120, 119(Pt), 117(Pt), 102, 152(Pt), 147(Pt), 144(Pt), 132, 133, 134, 130, 129, 128(Pt), 127, 110, 126, 137, 136, 135, 109, 107, 108, 106, 125, 139, 138, 140, 143, 112, 142, 141, 145(Pt), 101	J Kumar Casting yard	171815.6
5	Ghodbunder	185(Pt), 185(Pt), 184(Pt), 183(Pt), 182(Pt), 186(Pt)	Construction Material	5452.075
6	Ghodbunder		Construction Material	225.621
7	Chene	132, 133, 134, 130, 129, 136, 135, 101, 131	Construction Material	31236.66
8	Versave	GAOTHAN(Pt)	Construction Material	173.808
9	Ghodbunder	198(Pt)	Anu Industries (paper & ink manufacturing)	3590.272
10	Chene	85(Pt), 84(Pt), 82(Pt), 83(Pt), 89(Pt)	Cement, Concrete Footpath	6389.636

[11] Survey numbers/CTS numbers mentioned are to be referred from the respective revenue records and relevant land records from the respective offices.

Sr. No.	Village	Survey Number	Type	Estimated Area (Sq.M)
			Interlocking Tile	
11	Chene	40(Pt), 39(Pt), 41(Pt), 38(Pt), 43(Pt)	Concrete Pavers Manufacturing	7136.52
12	Versave	5(Pt), 7(Pt), 9(Pt), 10(Pt), 11(Pt)	Suryadipta Projects Pvt. Ltd.	12990.26
13	Versave	8(Pt), 5(Pt), 7(Pt), 6(Pt), 9(Pt),	Shree buddheshwar private limited estate	9528.907
14	Versave	Null(Pt)	Metal Parts Manufacturer	1607.724
15	Kashi	79(Pt), 103(Pt)	Deying Factory	2606.697
16	Mire	12(Pt), 88(Pt), 87(Pt), 91(Pt), 91(Pt)	Manufacturing construction material	31456.33
17	Kashi	80(Pt)	Card Board Factory	1467.224

10.6.1.3 List of Survey numbers in Prohibited Activities – Industrial – VVCMC

Sr. No.	Village	Survey Number	Type	Estimated Area (Sq.M)
1	Sasunawaghar	374(Pt), 251(Pt)	Bone and Tallow Industry	5730.820
2	Sasunawaghar	57(Pt), 108(Pt)	Ice factory	1239.361
3	Sasunawaghar	43(Pt), 40(Pt)	Petron F Global	856.330
4	Sasunawaghar	160(Pt), 155(Pt), 154(Pt)	RMC Plant	312.598
5	Sasunawaghar	97(Pt)	Skymix Concrete RMC Plant	1499.210

10.6.1.4 List of Survey numbers in Prohibited Activities – Industrial – Vasai Taluka

Sr. No	Village	Survey Number	Type	Estimated Area (Sq. M)
1	Mori	7/1(Pt), 35(Pt)	Saree printing industry	3167.111
2	Mori	37(Pt), 35(Pt)	Saree printing industry	3795.921
3	Mori	57(Pt), 44(Pt)	Mixcrete India (construction chemicals,	502.277

Sr. No	Village	Survey Number	Type	Estimated Area (Sq. M)
			coatings, and waterproofing products)	
4	Mori	35(Pt), 36(Pt)	Shree Powerex (Industrial Brushes)	530.406
5	Mori	PADA(Pt)	Pioneer Power International	743.508
6	Mori	35(Pt)	Amar Textiles	2648.035
7	Mori	35(Pt)	Saree printing industry	5097.607
8	Mori	PADA (Pt), 7/1, 34(Pt)	VTech Offshore Service Pvt. Ltd.	957.397
9	Mori	35(Pt)	Card Board Manufacturing	2308.67
10	Mori	15(Pt)	Yess Industry (Polishing Products)	325.046
11	Mori	15(Pt), 32(Pt)	SS Galvanizers	334.491
12	Mori	35(Pt), 36(Pt)	Mamta Insulations	392.781
13	Mori	35(Pt)	Spaciyo Enterprises Pvt Ltd (Manufacturer of modular furniture)	2368.05
14	Mori	35(Pt)	Amrit Prints (Saree Printing)	3580.89
15	Poman	164(Pt)	Sarvadnya Udyog Pvt Ltd (Manufacturing of electrical machinery)	2586.438
16	Poman	180(Pt)	Pentagon Tapes (manufacturing pressure-sensitive adhesive tapes)	910.440
17	Poman	175(Pt), 223(Pt)	Apollo Ropes and Alloys pvt ltd (manufacture in high-quality wire ropes)	1625.349
18	Poman	163(Pt)	Sky Global Chemicals	377.390
19	Poman	185(Pt), 186(Pt), 214(Pt)	Thermacol manufacturing industry	1101.138
20	Poman	180(Pt), 184(Pt)	Ikon Lamicoats (PVC Coated Polyster fabric)	1495.748
21	Poman	181(Pt), 183(Pt)	Mariyam PET Blow	300.206
22	Poman	181(Pt), 184(Pt)	Heavy metal springs manufacturing	889.242
23	Poman	178(Pt)	Rubber industry	210.24
24	Poman	175(Pt), 180(Pt)	R K Techniques (PVC-Coated Polyester Fabric Manufacturing)	1342.117
25	Poman	186(Pt), 213(Pt)	Card Board Manufacturing	46.16
26	Poman	185(Pt), 214(Pt), 221(Pt)	Magnet Adhesive Solutions	946.540
27	Poman	160(Pt), 161(Pt)	Chem Sells	1123.555
28	Poman	164(Pt), 167(Pt)	UHPC India Pvt Ltd (UHPC dry premix, wet-mix, and precast long-span girders)	613.749
29	Poman	164(Pt)	Steelfab Industries	1207.390

Sr. No	Village	Survey Number	Type	Estimated Area (Sq. M)
30	Poman	162(Pt), 164(Pt)	Sauradip Chemicals Pvt Ltd	1350.487
31	Poman	162(Pt)	Industrial Vessel Manufacturing	583.240
32	Poman	213(Pt)	Spaciyo Enterprises Pvt Ltd (Manufacturer of modular furniture)	73.71
33	Poman	186(Pt)	Amrit Prints (Saree Printing)	816.64
34	Poman	185(Pt)	Plywood Factory	767.019
35	Poman	185(Pt)	Duo Exam Board Manufacturing	656.554
36	Poman	185(Pt), 214(Pt)	Alphabet Imaging Technologies Pvt Ltd	1024.826
37	Poman	180(Pt)	Industrial Vessel Manufacturing	575.869
38	Poman	180(Pt)	V5 Interiors (Wood Based industry)	560.167
39	Poman	180(Pt)	Nilkanth Plasto Pack	512.324
40	Poman	180(Pt)	Plastic bottle manufacturing industry	542.915
41	Poman	175(Pt), 180(Pt)	Royal Industries (Extruded Rubber Profiles Manufacturing)	970.172
42	Poman	175(Pt)	Mutual Engineering Pvt Ltd (precision tooling and mould manufacturing)	2276.344
43	Poman	174(Pt)	Selver Conveyors Pvt Ltd	2642.339
44	Poman	174(Pt), 175(Pt), 182(Pt)	Helli Moulds Pvt Ltd (precision injection mould manufacturing and CNC machining)	1668.298
45	Poman	174(Pt), 175(Pt), 176(Pt)	Hitech Moulds Pvt Ltd (precision injection mould manufacturing)	2003.434
46	Poman	178(Pt), 223(Pt)	Dhaval Products (Manufactures and supplies various liquid cleaning products)	797.568
47	Poman	178(Pt)	Rubber industry	2339.608
48	Poman	178(Pt)	Brio industries (brass components and metal forgings)	550.797
49	Poman	178(Pt)	Plywood dealer	551.381
50	Poman	180(Pt)	Ananta Infrachem LLP (Manufacturer of metals and chemicals)	398.739
51	Poman	175(Pt), 180(Pt)	Street light manufacturing industry	2418.361

Sr. No	Village	Survey Number	Type	Estimated Area (Sq. M)
52	Poman	181(Pt)	E-Luna (E-Bike Manufacturing)	938.916
53	Poman	181(Pt)	Jumbo Quality Metal Prints and Pack	779.000
54	Poman	181(Pt), 184(Pt)	Krishna Shivam DIgitex	2208.660
55	Poman	182(Pt)	M S Petro Chemical	1127.621
56	Shilottar	4(Pt), 23(Pt)	Petron F Global	345.940

10.6.1.5 List of Survey numbers in Prohibited Activities – Industrial – TMC

Sr. No	Village	Survey Number	Type	Estimated Area (Sq. M)
1	Chitalsar manpada	59A/9(Pt)	Application Systems	248.77
2	Pachpakhadi	265(Pt)	Associated Engineers	992.36
3	Chitalsar manpada	59A/1 P(Pt), 59A/5 P(Pt), 59A/11(Pt)	Construction materials	911.84
4	Kavesar	149(Pt), 158(Pt)	Dalal Engineering Pvt Ltd (stainless steel process equipment)	3511.35
5	Majiwade	263(Pt)	Dhiman Rubber Machinery Manufacturer	250.05
6	Pachpakhadi	265(Pt)	Elvee Industries	42.37
7	Pachpakhadi	265(Pt), 520(Pt), ROAD(Pt)	International Industrial Springs	929.83
8	Bhaindar pada	Road (Pt), 21(Pt), Road (Pt), 16 P(Pt), 18(Pt), 20(Pt), 17P(Pt), 22(Pt)	J Kumar Infraprojects Pvt Ltd (Pier and Girders for Metro)	15920.44
9	Pachpakhadi	287(Pt)	Lance Auto Parts	1150.33
10	Boriwade	79 P(Pt), 2/1(Pt), 5/2(Pt), 74(Pt), 76(Pt), 72(Pt), 1/2(Pt), 1/1(Pt), 3(Pt), 5/1(Pt), 6/2(Pt), 8/5(Pt), 8/1(Pt), 8/4(Pt), 6/3(Pt), 6/1(Pt), 2/4, 2/3, 2/5, 2/2, 6/5, 4/1, 4/2	Megha Engineering & Infrastructures Ltd (MEIL)	80274.60
11	Chitalsar manpada	59A/9(Pt)	Mikron Teknik Pvt. Ltd	625.04
12	Majiwade	263(Pt)	Mukesh Heavy Industries	300.76
13	Majiwade	263(Pt)	Laxmi Traders	165.86
14	Chitalsar manpada	59A/8(Pt), 59A/1 P(Pt)	Plywood and woodworks	654.97
15	Chitalsar manpada	59A/9(Pt)	Plywood and woodworks	474.47

Sr. No	Village	Survey Number	Type	Estimated Area (Sq. M)
16	Chitalsar manpada	59A/9(Pt)	Plywood and woodworks	395.26
17	Chitalsar manpada	59A/9(Pt)	Plywood and woodworks	395.51
18	Chitalsar manpada	59A/9(Pt), 59A/11(Pt)	Ramco Ancillary (Plastic Packaging)	643.55
19	Pachpakhadi	265(Pt)	Rao Engineering Pvt. Ltd.	670.33
20	Chitalsar manpada	59A/9(Pt), 59A/11(Pt)	Revansh foods LLP	212.45
21	Pachpakhadi	287(Pt)	Rubicon Research Pvt. ltd.	332.14
22	Majiwade	263(Pt)	S. K. Engineering Works	131.73
23	Pachpakhadi	520(Pt)	S.S. Enterprises	53.14
24	Majiwade	233(Pt)	Dabir Mechanical works	371.08
25	Pachpakhadi	265(Pt)	Super Electricals	996.09
26	Chitalsar manpada	59A/9(Pt), 59A/1 P(Pt)	Shree Balaji Wood Works	88.39
27	Chitalsar manpada	59A/1 P(Pt)	Gotey Automation	359.33
28	Majiwade	263(Pt)	Tathastu Engineering (Fabrications)	135.00
29	Pachpakhadi	265(Pt)	Tower Engineering Pvt. Ltd.	1320.06
30	Majiwade	318(Pt), 320(Pt), 319(Pt), 420(Pt), 291(Pt), 291(Pt), 291(Pt), 291(Pt), 321(Pt), 321(Pt), 321(Pt), 321(Pt)	Uni Abex Alloy Products Ltd. (Centrifugal and Static Castings)	18138.49
31	Majiwade	321(Pt)	Uni Deritend Limited (Investment casting)	10719.79
32	Chitalsar manpada	59A/8(Pt), 59A/9(Pt)	Unity Enterprises (Industrial Fabricated items, supplier of electrical switchgear items)	398.69
33	Chitalsar manpada	59A/5 P(Pt) 59A/28(Pt) 59A/1 P(Pt)	Furniture Factory	1318.14
34	Majiwade	263(Pt)	Vijay Fabricators	147.88
35	Majiwade	233(Pt), 264(Pt)	Vignahar Engineering Works	270.45
36	Bhaindar pada	Road (Pt), 16P(Pt), 20(Pt), Khadi(Pt), 17 P(Pt)	Vinayaga Marine Petro Ltd (Maritime and Offshore Infrastructure)	37401.49
37	Majiwade	263(Pt)	Mumbai Wood works/ Daya Packers	132.87

Sr. No	Village	Survey Number	Type	Estimated Area (Sq. M)
38	Pachpakhadi	289(Pt), 291(Pt)	Kiron Textile Industries	2157.76
39	Majiwade	263(Pt)	Ratan Springs	127.41
40	Majiwade	263(Pt)	J.S Industries	543.87
41	Majiwade	233(Pt)	Enerjet Engineering Services (metal fabrication, machining, and assembly)	229.48
42	Majiwade	233(Pt)	Alfatech Engineering Private Limited / UNIVERSAL MEP Projects and Engineering Services Limited	332.61
43	Majiwade	233(Pt)	Jeetswara enterprises	286.99
44	Majiwade	268(Pt)	Shivanand Machine Tools	217.14
45	Majiwade	268(Pt)	Mayfair Machinekraft Pvt. Ltd.	295.45
46	Majiwade	268(Pt)	Gemini Tool Engineers	125.23
47	Chitalsar manpada	59A/9(Pt)	Navkar Furniture	263.48
48	Chitalsar manpada	59A/9(Pt)	Maestrotech Enterprises LLP	289.50
49	Majiwade	263(Pt)	Navin Engineers (precision parts, jigs and fixtures	286.99
50	Majiwade	268(Pt)	Smita Engineering Works	56.77
51	Chitalsar manpada	59A/9(Pt)	Alpha Beltech & Systems	243.22
52	Chitalsar manpada	59A/9(Pt), 59A/1 P(Pt)	Eurospin Dry Cleaners Higin Cleaning Systems	212.15
53	Chitalsar manpada	59A/9(Pt), 59A/1 P(Pt)	Saw Mill	222.24
54	Majiwade	263(Pt)	Megha Pattern Works (Metal and Wooden Pattern)	108.67
56	Majiwade	263(Pt)	Reyansh Engineering Works (Metalworking & fabrication)	277.93
57	Pachpakhadi	Road (Pt), 520(Pt), 265(Pt)	Metals and Allied products	1119.86

Sr. No	Village	Survey Number	Type	Estimated Area (Sq. M)
58	Chitalsar manpada	59A/9(Pt)	Star Perfumery Works	326.65
59	Pachpakhadi	287(Pt)	Electroteknics (Manufacturer of electrical equipment)	679.81
60	Chitalsar manpada	59A/5 P(Pt), 59A/28(Pt)	Wood I Land Interiors	676.88
61	Chitalsar manpada	59A/9(Pt)	UNITOP Multitech (I) Pvt. Ltd.	277.48

10.6.2 List of CTS/ Survey numbers [12] in Prohibited Activities – Mining

10.6.2.1 List of CTS numbers in Prohibited Activities – Mining – BMC

Sr. No.	Ward	Name of Location	CTS Number	Type	Estimated Area (Sq.M)
1	R/North	Ketki Pada, Dahisar	3000(Pt), 3010(Pt), 3010(Pt), 3035(Pt), 3036(Pt), 3039(Pt), 3065(Pt), 3065(Pt), 3066(Pt), 3066, 3066, 3066(Pt), 3067, 3069, 3070, 3071(Pt), 3071(Pt), 3073(Pt), 3107A(Pt), 3107A(Pt), 3095(Pt), 3098, 3099, 3100, 3101, 3102(Pt), 3103(Pt), 3104(Pt), 3105(Pt), 3107A(Pt), 3119(Pt).	Mining	6,01,975.98
2	R/South	Poisar, Kandivali East	174E/1(Pt), 874B/1(Pt), 874B/2, 874C/10(Pt), 874C/12 (Pt) 874C/13(Pt), 874C/15(Pt).	Mining	1,54,221.89

10.6.2.2 List of Survey CTS numbers in Prohibited Activities – Mining – TMC

Sr. No.	Village	Survey Number	Type	Estimated Area (Sq.M)
1	Bhyanderpada	Khadi (Pt)	Mining	14,545.18

[12] Survey numbers/CTS numbers mentioned are to be referred from the respective revenue records and relevant land records from the respective offices.

10.6.3 List of CTS/ Survey numbers[13] in Prohibited Activities – Slums

10.6.3.1 List of CTS numbers in Prohibited Activities – Slums – BMC

Sr. No.	Ward	Name of Slum	CTS Number	Estimated Area (Sq.M)
1	R/North	Ketki Pada, Dahisar	2776A(Pt), 2872/7(Pt), 2875(Pt), 2876(Pt), 2877, 2878(Pt), 2879(Pt), 2884, 2888(Pt), 2892, 2894(Pt), 2895(Pt), 2896(Pt), 2897(Pt), 2898, 2902, 2903(Pt), 2904, 2905, 2906, 2907(Pt), 2908, 2909, 2910, 2912, 2913, 2916, 2917, 2918, 2919, 2921, 2922, 2923, 2924, 2925, 2926, 2927, 2928, 2929(Pt), 2931, 2932, 2933, 2934, 2935, 2936, 2937, 2967E(Pt), 2967G(Pt), 2971C(Pt), 2976D(Pt), 2976F(Pt), 2979, 2980, 2981, 2982, 2983, 2984, 2985, 2986, 2987, 2988(Pt), 2989, 2990, 2991(Pt), 2992(Pt), 2993, 2994(Pt), 2995(Pt), 2996(Pt), 2997, 2998, 2999, 3000, 3001, 3002, 3003, 3004, 3005, 3006, 3007, 3008(Pt), 3009(Pt), 3010(Pt), 3011, 3012, 3013, 3014(Pt), 3015(Pt), 3016(Pt), 3017(Pt), 3018, 3019, 3020(Pt), 3021, 3022, 3023, 3026, 3027, 3028, 3030, 3031, 3032, 3033(Pt), 3034(Pt), 3035(Pt), 3036(Pt), 3039(Pt), 3040, 3041, 3042, 3043, 3044, 3045, 3046, 3047, 3048, 3049, 3050, 3051, 3052, 3053, 3054, 3055, 3056, 3057, 3058, 3059, 3060, 3061, 3062, 3065(Pt), 3066(Pt), 3071(Pt), 3072(Pt), 3073(Pt), 3074, 3075(Pt), 3076(Pt), 3077(Pt), 3078, 3080(Pt), 3081(Pt), 3082(Pt), 3083, 3084, 3085, 3087, 3088(Pt), 3088A/2(Pt), 3088B(Pt), 3088C(Pt), 3088D, 3092A/1(Pt), 3092A/5(Pt), 3092A/6(Pt), 3092A/7(Pt), 3094A(Pt), 3095(Pt), 3102(Pt), 3109C	36,306.009
2	R/North	Konkani Pada, Dahisar	2445(Pt), 2553(Pt), 2771(Pt), 2772A(Pt), 2772B(Pt), 2772C(Pt), 2772D, 2773(Pt), 2776A(Pt), 2776B(Pt), 2776D(Pt), 2781(Pt), 3039(Pt)	24,776.915
3	R/Central	Sukharwadi, Kanheri	523(Pt), 14-A-B(Pt), 521(Pt), 525/2(Pt), 522(Pt)	1,543.812

[13] Survey numbers/CTS numbers mentioned are to be referred from the respective revenue records and relevant land records from the respective offices.

Sr. No.	Ward	Name of Slum	CTS Number	Estimated Area (Sq.M)
4	R/Central	Kulupwadi, Kanheri	76(Pt), 79D(Pt), 544A(Pt), 547(Pt), 550(Pt)	987.58
5	R/Central	Devi Pade, Magathane	168(Pt), 215(Pt), 251(Pt), 252(Pt), 253(Pt), 254, 255, 256, 257, 258, 259(Pt), 262(Pt), 263(Pt), 264(Pt), 265(Pt), 265X(Pt), 266(Pt), 267(Pt), 268(Pt), 269(Pt), 270(Pt), 273A(Pt), 273C(Pt), 284(Pt)	37,977.80
6	R/Central	Siddhart Nagar, Magathane	267(Pt), 276(Pt)	272.226
7	R/Central	Janupada, Magathane	168(Pt) ,168/13(Pt)	752.95
8	R/South	Janupada, Poisar	21(Pt), 168/13(Pt), 809A/1/19A/1/1/1/1A/1A(Pt), 809A/1/19A/1/1/1C(Pt), 809A/1/19A/1/1/1C/1(Pt), 809A/1/19A/1/1/1C/2(Pt), 874D/1(Pt), 874D/2(Pt)	11,523.26
9	R/South	Damu Nagar, Akurli	171/1A/12(Pt), 171/1A/21(Pt), 174C, 174E/1(Pt), 174E/2(Pt)	16,202.90
10	R/South	Gautam Nagar, Akurli	171/1A/21(Pt), 174C(Pt)	2,155.02
11	R/South	Appa Pada, Akurli	171/4B (Pt), 174C (Pt).	3462.98
12	P/North	Appa Pada, Malad East	15A(Pt), 16A(Pt), 16B(Pt), 17(Pt), 21A(Pt), 21C(Pt), 22A(Pt), 23(Pt), 25B(Pt), 25C(Pt), 29(Pt), 30(Pt), 31(Pt), 32, 33(Pt), 34, 35(Pt), 36, 37, 38(Pt), 39(Pt), 40(Pt), 41(Pt), 42, 44, 45, 46, 47(Pt), 48, 49(Pt), 50(Pt), 51(Pt), 52(Pt), 53(Pt), 54, 55(Pt), 57(Pt), 58(Pt), 59, 63(Pt), 64, 65, 66, 67(Pt), 68(Pt), 69(Pt), 70(Pt), 171/4B(Pt), 174C(Pt).	1,30,300.00
13	P/North	Kurar, Malad East	70(Pt), 322(Pt), 326(Pt), 328/1, 330, 331, 336(Pt), 337(Pt), 496(Pt), 505, 506, 507, 508(Pt), 509(Pt), 509/1(Pt), 509/2(Pt), 509/3(Pt), 509/4(Pt), 509/5(Pt), 509/6(Pt), 509/7(Pt), 560.	29,567.70

Sr. No.	Ward	Name of Slum	CTS Number	Estimated Area (Sq.M)
14	P/North	Triveni Nagar	601(Pt), 701B/1A/1/1(Pt), 702, 703(Pt), 704, 705(Pt), 709A (Pt)	11,141.70
15	P/North	Pimpripada, Malad East	70(Pt), 156(Pt), 600(Pt), 601, 602(Pt), 603(Pt), 604(Pt), 605(Pt), 607(Pt), 610A/1A/1/1(Pt) (Pt), 610A/1A/1A(Pt), 610A/1A/2C(Pt), 626, 677B/1(Pt), 677B/5, 693(Pt), 694, 695, 696PT(Pt), 697(Pt), 700(Pt), 700/1, 703, 704, 705, 709A, 738B/1A (Pt), 827PT (Pt).	1,21,865.952
16	P/North	Aarey	1(Pt), 25(Pt)	38,894.60
17	P/South	Aarey	1(Pt), 5(Pt), 12(Pt), 17(Pt), 25(Pt), 25/7(Pt), 28/1(Pt), 29(Pt), 29/2(Pt), 29/13(Pt), 33(Pt), 36, 37(Pt), 1/31 (Pt), 1/32 (Pt), 190A/1A/1(Pt), 258(Pt), 626A (Pt), 626B (Pt), 1627(Pt), 1677(Pt), 1681(Pt), Null	483,085.12
18	P/South	Marol Maroshi	1627(Pt), 1677(Pt), 1681(Pt), 1689(Pt)	70,079.56
19	P/South	SAAI	24(Pt)	5470.62
20	K/East	PRAJAPUR	1(Pt), 2(Pt), 3(Pt), 5(Pt), 6(Pt), 8(Pt), 11(Pt).	90,828.06
21	K/East	VYARAVLI	1(Pt), 2(Pt)	24,669.14
22	S	Paspoli	1(Pt), 2(Pt), 5(Pt), 5/65(Pt), 82(Pt)	109809.00
23	S	Hanuman Nagar, KANJUR-W	203(Pt), 292(Pt)	14291.08
24	S	Konkan Nagar, Kanjur West	1(Pt), 200(Pt)	42,968.20

Sr. No.	Ward	Name of Slum	CTS Number	Estimated Area (Sq.M)
25	T	Tenbhipada	1(Pt), 6(Pt), 7(Pt), 7/5(Pt). 7/2(Pt), 7/1(Pt)	35,249.81
26	S	Tenbhipada	2(Pt), 8(Pt)	5355.66
27	S	Khindipada	3(Pt), 4A(Pt), 469(Pt), 480(Pt), 481(Pt).	10,677.439
28	T	Khindipada	9(Pt), 13_16(Pt), 470(Pt).	32337.241
29	T	Amar Nagar	469(Pt), 469/1(Pt), 469/3(Pt).	28,194.714
30	T	Rahul Nagar	259(Pt), 260/3(Pt), 469/1(Pt).	7670.10
31	T	Hanuman Pada	1(Pt), 1/A(Pt), 1B(Pt), 5(Pt), 5 (Pt) (Pt), 6, 7, 8, 9, 10, 11, 11-01, 12, 13, 13-01, 14, 15, 15-01, 15-02(Pt), 15-03(Pt), 15-06, 15-07, 15-08(Pt), 15-09(Pt), 15-10(Pt), 17, 18, 19(Pt), 20, 20-01, 21, 22, 23, 24, 25, 26, 26-01, 26-02, 27, 28(Pt), 28-01(Pt), 07-01, 08-01, 08-02, 201, 202, 203, 204, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 245/2, 246, 251(Pt), 252(Pt), 253(Pt), 254, 255, 256, 257(Pt), 257(Pt), 258(Pt), 260/3, 260/3, 106B/5, 422(Pt), 422(Pt), 422(Pt), 422(Pt), 9999.	51,923.632
32	T	Ghati Pada	3A(Pt), 3B/1(Pt), 4-01(Pt), 4-01(Pt), 4-01(Pt), 19-03(Pt), 19-03(Pt),	2859.225

10.6.3.2 List of Survey numbers in Prohibited Activities – Slums – MBMC

Sr. No	Village	Name of Slum	Survey Number	Estimated Area (Sq.M)
1	Ghodbunder	Dachkul Pada	172(Pt) , 185(Pt) , 180(Pt) , 178(Pt) , 177(Pt) , 215(Pt) , 178(Pt) , 191(Pt) , 215(Pt) , 176(Pt) , 185(Pt) , 180(Pt) ,	31217.30

Sr. No	Village	Name of Slum	Survey Number	Estimated Area (Sq.M)
			183(Pt) , 185(Pt) , 215(Pt) , 183(Pt) , 174(Pt) , 184(Pt), 173(Pt), 17(Pt)	
2	Ghodbunder	Kashimira	17((Pt)	2170.54
3	Versave	Jaihind Nagar	53(Pt) , 50(Pt) , 34(Pt) , 52(Pt)	9240.24
4	Mire	Mahajan Wadi	12 (Pt), 9(Pt) , 12(Pt) , 9(Pt) , 11(Pt) , 10(Pt) , 12(Pt) , 11(Pt) , 12(Pt) , 9(Pt)	16240.76
5	Kashi	Mandvi Pada	80(Pt) , 79(Pt) , 82(Pt) , 83(Pt) , 82(Pt) , 79(Pt) , 82 (Pt), 94(Pt) , 89(Pt) , 83(Pt),107(Pt)	17441.28
6	Kashi	Mashachapada	55 (Pt), 54(Pt) , 55(Pt) , 102 , 60 , 63 , 96(Pt) , 59(Pt) , 101(Pt) , 55(Pt)	22868.60
7	Mire	MIDC Mira Road East	91(Pt) , 88(Pt)	1092.92
8	Versave	Retibunder	12(Pt) , 11 (Pt), 9 (Pt), 11(Pt) , 9(Pt) , 7(Pt) , 11(Pt)	11639.90

10.6.3.3 List of Survey numbers in Prohibited Activities – Slums – TMC

Sr. No.	Village	Name of Slum	Survey Number	Estimated Area (Sq.M)
1	Pachpakhadi	Shree Nagar	432(Pt) ,519(Pt)	19429.71
2	Pachpakhadi	Kailash Nagar	423(Pt), 430(Pt), Nursary(Pt)	2,715.48
3	Pachpakhadi	Junagaon	Nursary(Pt)	7,767.35
4	Pachpakhadi	Hanuman Nagar	265(Pt), 266(Pt), 267(Pt), 288(Pt), 371(Pt), 373(Pt), 520(Pt), Nursary(Pt)	72161.54
5	Pachpakhadi	Ram Nagar	263(Pt), 265(Pt)	25611.40
6	Pachpakhadi	Karvalo Nagar	160(Pt), 163(Pt), 291(Pt), 373(Pt)	29,984.60
7	Pachpakhadi	Gangadhar Nagar	291(Pt), Nala(Pt)	4,043.46
8	Kolshet	Patlipada	108(Pt), 285(Pt), 291(Pt)	7472.88
9	Chitalsar manpada	Manpada	59A/1 P(Pt), 59A/6(Pt), 59A/7(Pt), 59A/8(Pt), 59A/9(Pt)	16,395.94
10	Majiwade	Lokmanya Nagar	253(Pt), 338 P(Pt), 380(Pt), 407(Pt), Road(Pt)	49,955.85
11	Pachpakhadi	Lokmanya Nagar	158(Pt), 159(Pt), 160(Pt), Road(Pt)	6,716.59
12	Majiwade	Konkanipada	273(Pt), 276(Pt), 292(Pt), 293(Pt), 301(Pt), 350(Pt), Road(Pt)	17,306.47
13	Chitalsar manpada	Konkanipada	57/2(Pt), 57/3(Pt)	1,130.13

10.7 ANNEXURE-VII-Sub Criteria AHP Calculation

10.7.1 Physical and Natural Feature- Sub Criteria AHP Calculation

Assigning of weights

Sub Criteria		Slope	Soil type	Tree Cover	Water body presence	Surface Contamination
C1.1	Slope	1	1	0.14	0.333333	3
C1.2	Soil type	1	1	0.142857	0.333333	5
C1.3	Tree Cover	7	7	1	5	7
C1.4	Water body presence	3	3	0.2	1	3
C1.5	Surface Contamination	0.333333	0.2	0.142857	0.333333	1
	SUM	**12.33333**	**12.2**	**1.628571**	**7**	**19**

Normalization of weights

Sub Criteria	C1.1	C1.2	C1.3	C1.4	C1.5	Total	Criteria weights (Average)	(Ratio)CM
C1.1	0.081081	0.081967	0.087719	0.047619	0.1578947	0.456281	0.091256	5.307408539
C1.2	0.081081	0.081967	0.087719	0.047619	0.2631579	0.561545	0.112309	5.136640616
C1.3	0.567568	0.57377	0.614035	0.714286	0.3684211	2.83808	0.567616	5.689097364
C1.4	0.243243	0.245902	0.122807	0.142857	0.1578947	0.912704	0.182541	5.728001567
C1.5	0.027027	0.016393	0.087719	0.047619	0.0526316	0.23139	0.046278	5.209670339
						5	λ max	5.414163685
							CI	0.103540921
							RI	1.12
							CR	0.092447251

10.7.2 Built Form- Sub Criteria AHP Calculation

Assigning of weights

Sub Criteria		Footprints	Existing Landuse	Slums/ encroachments	Population Density
C2.1	Footprints	1	0.333333	0.2	0.333333
C2.2	Existing Landuse	3	1	1	3
C2.3	Slums/ encroachments	5	1	1	3
C2.4	Population Density	3	0.333333	0.333333333	1
	SUM	**12**	**2.666667**	**2.533333333**	**7.333333**

Normalization of weights

Sub Criteria	C2.1	C2.2	C2.3	C2.4	Total	Criteria weights	(Ratio)CM
C2.1	0.0833333	0.125	0.078947368	0.045455	0.332735	0.083184	4.034512
C2.2	0.25	0.375	0.394736842	0.409091	1.428828	0.357207	4.165202
C2.3	0.4166667	0.375	0.394736842	0.409091	1.595494	0.398874	4.147195
C2.4	0.25	0.125	0.131578947	0.136364	0.642943	0.160736	4.120517
					4	λ max	4.116856
						CI	0.038952
						RI	0.9
						CR	0.04328

10.7.3 Disaster and Conflicts- Sub Criteria AHP Calculation

Assigning of weights

Sub Criteria		Man Animal Conflicts	Flood Prone areas
C5.1	Man Animal Conflicts	1	0.142857
C5.2	Flood Prone areas	7	1
	SUM	**8**	**1.142857**

Normalization of weights

Sub Criteria	C3.1	C3.2	Total	Criteria weights
C3.1	0.125	0.125	0.25	0.125
C3.2	0.875	0.875	1.75	0.875

10.7.4 Fauna- Sub Criteria AHP Calculation

Assigning of weights

Sub Criteria		Fauna Density	Fauna Natal Dispersal Distance	Fauna Age	Fauna Health	Fauna Location
C4.1	Fauna Density	1	9	5	3	9
C4.2	Fauna Natal Dispersal Distance	0.111111	1	0.142857	0.142857	0.3333333
C4.3	Fauna Age	0.2	5	1	0.333333	5
C4.4	Fauna Health	0.333333	7	3	1	7
C4.5	Fauna Location	0.111111	3	0.2	0.142857	1
	SUM	**1.755556**	**25**	**9.342857**	**4.619048**	**22.333333**

Normalization of weights

Sub Criteria	C9.1	C9.2	C9.3	C9.4	C9.5	Total	Criteria weights (Average)	(Ratio)CM
C4.1	0.56962	0.36	0.535168	0.649485	0.4029851	2.517258	0.503452	5.588823
C4.2	0.063291	0.04	0.015291	0.030928	0.0149254	0.164435	0.032887	5.039848
C4.3	0.113924	0.2	0.107034	0.072165	0.2238806	0.717003	0.143401	5.4183
C4.4	0.189873	0.28	0.321101	0.216495	0.3134328	1.320902	0.26418	5.621049
C4.5	0.063291	0.12	0.021407	0.030928	0.0447761	0.280402	0.05608	4.941133
						5	λ max	5.321831
							CI	0.080458
							RI	1.12
							CR	0.071837

10.7.5 Flora- Sub Criteria AHP Calculation

Assigning of weights

Sub Criteria		Flora Density	Flora Natal Dispersal Distance	Flora Age	Flora Health	Flora Location	Flora Permanence
C10.1	Flora Density	1	9	7	1	3	5
C10.2	Flora Natal Dispersal Distance	0.111111	1	0.2	0.111111	0.1428571	0.3333333
C10.3	Flora Age	0.142857	5	1	0.142857	0.2	3
C10.4	Flora Health	1	9	7	1	3	3
C10.5	Flora Location	0.333333	7	5	0.333333	1	3
C10.6	Flora Permanence	0.2	3	0.333333	0.333333	0.3333333	1
	SUM	**2.787302**	**34**	**20.53333**	**2.920635**	**7.6761905**	**15.333333**

Normalization of weights

Sub Criteria	C10.1	C10.2	C10.3	C10.4	C10.5	C10.6	Total	Criteria weights (Average)	(Ratio)CM
C10.1	0.35877	0.264706	0.340909	0.342391	0.390818 9	0.326087	2.023682	0.33728	6.907762
C10.2	0.039863	0.029412	0.00974	0.038043	0.018610 4	0.021739 1	0.157408	0.026235	6.183251
C10.3	0.051253	0.147059	0.048701	0.048913	0.026054 6	0.195652 2	0.517633	0.086272	6.303752
C10.4	0.35877	0.264706	0.340909	0.342391	0.390818 9	0.195652 2	1.893247	0.315541	6.962177
C10.5	0.11959	0.205882	0.243506	0.11413	0.130273	0.195652 2	1.009034	0.168172	7.137205
C10.6	0.071754	0.088235	0.016234	0.11413	0.043424 3	0.065217 4	0.398995	0.066499	6.055031
							6	λ max	6.59153
								CI	0.118306
								RI	1.24
								CR	0.095408

10.8 ANNEXURE-VIII-List of CTS/Survey Numbers[14] in ESZ-1, ESZ-2, ESZ-3, Area for Eco Tourism Development Potential and Immediate Impact Area of Human Animal Conflict

10.8.1 List of CTS/ Survey Number in ESZ-1

10.8.1.1 List of CTS in ESZ 1 - BMC

Zone	Village	Ward	CTS number
ESZ-1	AKURLI	R/S	171/1A/33(Pt),171/1A/18(Pt),171/1A/22(Pt),171/1A/39(Pt),174C(Pt),174D(Pt),171/1A/21(Pt), 171/1A/32(Pt), 171/1A/12(Pt)
ESZ-1	DAHISAR	R/C	1881(Pt),1998/58(Pt),1998/53,1998/57,1998/52,1998/128,1998/134,1998/126,1884,1969,1998/127,1998/125,1998/124,1998,1929,1927(Pt),1932(Pt),1975(Pt),1998/1,1998/86,1998/85,1966(Pt),1965(Pt),1930,1931(Pt),1879(Pt),2219(Pt),1885,1926,2220A/22(Pt),2220A/18(Pt),2220C,2220B/1B(Pt),2220D,2220B/1C(Pt),1998/3(Pt),1998/2,1998/8(Pt),1998/7(Pt),1998/10,1998/5,1998/9,1998/6,1998/12(Pt),1998(Pt),1998/30(Pt),1998/13(Pt),1998/11,1998/14,1998,1998,1998/17(Pt),1998/22(Pt),1998/18(Pt),1998/21(Pt),1998/20(Pt),1998/19(Pt),1998/91(Pt),1998/89,1998/90(Pt),1998/88,1998/35,1998/36,1998/34,2220A/4(Pt),2220A/8(Pt),2220A/5(Pt),2220A/12,2220A/14(Pt),2220A/11(Pt),2220A/15,1997,1997,1998/31(Pt),1998/32(Pt),1998/123,1998/129,2220A/1A(Pt),2220A/1B,2220A/29(Pt),2220A/25(Pt),2220A/13,1883,1922(Pt),1998/81(Pt),1998/83,1998/51,1998/46,1998/41,1998/50,1998/49,1998/47,1998/40,1998/45,1998/39,2220A/2,2220A/3(Pt),2220A/6,2220A/9,199887,1967,1963(Pt),1996(Pt),1991,1998,1998,1998/33,1998,1964(Pt),1925,1882,1924,1998/132,1998/133,1998/131,1998/130,1972,1989(Pt),1973,1974,1992(Pt),1990,1977(Pt),1970,1971,1923,1920(Pt),1998/44,1998/48,1998/42,1998/43,1998/84,1998/82,1998/80(Pt),1998/38,1998/56,1998/55,1998/54,1934(Pt),1928,1976(Pt),1968,2007(Pt),1881,1921,1886(Pt),1998/135(Pt),1998/117,1998/115(Pt),1998/116(Pt),1998/113(Pt),1998/114(Pt),1998/119,1998/118,1998/120(Pt),1998/121(Pt),1998/122(Pt),1998/208/5,1998/208/9,1998/208/1(Pt), 1879(Pt),1998/13(Pt)
ESZ-1	DAHISAR	R/N	2971B(Pt),3088(Pt),3088C(Pt) ,2776B(Pt),3088D(Pt),3087,3092A/7(Pt),3105,3095(Pt),3094A(Pt),3073(Pt),3074(Pt),3077(Pt),3078,3088B(Pt),2772A(Pt),2971A(Pt),2971D(Pt),3075(Pt),2

[14] Survey numbers/CTS numbers mentioned are to be referred from the respective revenue records and relevant land records from the respective offices.

Zone	Village	Ward	CTS number
			776D(Pt),3108(Pt),3104,3083,3084,3080,3085,3092A/1(Pt),2976D(Pt),3081,2967E,2967G,2781(Pt),3082,3088A/2(Pt),3076,3071(Pt),3072(Pt),3107A,3107A(Pt),3113D(Pt),3092A/6(Pt),3092A/5(Pt),
ESZ-1	EKSAR-N	R/C	2641(Pt)
ESZ-1	KANHERI	R/C	560(Pt),542B,537,537,537,538,541,540,539,543(Pt),524(Pt),545,546,520(Pt)215,74,72(Pt),73,77B(Pt),75,77A(Pt),1,9999(Pt),559(Pt),14-A-B(Pt),14D,14C,525/2(Pt),26,25,25A,27,28,24B(Pt),24B/1(Pt),29A(Pt),29B(Pt),555(Pt),79D(Pt),550(P,544B(Pt),544A(Pt),547,548,76,542A,542(Pt),521(Pt)
ESZ-1	KANJUR-W	S	203(Pt)
ESZ-1	KURAR	P/N	326(Pt),508(Pt),509/16,509/17,509/4,509/5,509/6,509/7,509/11,509/12,509/13,509/14,509/18,509/19,509/20,509/21,509/27,509/28,509/29,509/23,509/24,509/25,509/26,509/33,509/32,509/34,505(Pt),507(Pt),330,509/30,509/31,506(Pt),509/22,509/1,509/2,509/3,509/10,509/9,509/15,509(Pt),509/8,322(Pt)
ESZ-1	MAGATHANE	R/C	268,258(Pt),251(Pt),267(Pt),264(Pt),168/7,168/7,257,284(Pt),255,259(Pt),215(Pt),273A(Pt),280(Pt),256,202,281(Pt),270(Pt),275,269,276(Pt),262(Pt),261(Pt),168/6(Pt),168/13(Pt),252(Pt),253(Pt),254,168/9(Pt),263(Pt),266
ESZ-1	MAGATHANE	R/S	168/13(Pt), 168/6(Pt)
ESZ-1	MALAD-E	P/N	15A(Pt),626(Pt),610A/1A/1/1(Pt),610A/1A/1/1(Pt),610A/1A/1/1(Pt),53(Pt),68(Pt),49,51(Pt),709A(Pt),610A/1A/2C(Pt),610A/1A/1(Pt)(Pt),827A/1C/1C,827A/1C/1B,827PT,601(Pt),701B/1A/2(Pt),693(Pt),827A/2,827A/4A/1,827A/4A/1,706A(Pt),705,704(Pt),710/11(Pt),710/15(Pt),710/16,710/17(Pt),710/18,710/19,703(Pt),689,50,70(Pt) ,692A/1/1A(Pt),717B(Pt),701B/2(Pt),697(Pt),44,42(Pt),41(Pt),40(Pt),38(Pt),29(Pt),47,695,695,63(Pt),64(Pt),66(Pt),65(Pt),710/22,707,710/A(Pt),710/4(Pt),710/5,710/6,710/7,710/8,710/12,710/13,710/10,710/21,702,67(Pt),701B/1A/1/2(Pt),677B/5,827,692A/2/1(Pt),692A/3,700(Pt),827A/1B,17,55(Pt),57(Pt),31,30,35,32,34,69(Pt),36,37,39(Pt),46,45,25C(Pt),26(Pt),22A,20C(Pt),21A(Pt),58(Pt),718,719(Pt),714,713,712,715(Pt),720(Pt),710(Pt),19C(Pt),33,48,20B(Pt),22B,710/2(Pt),701B/1A/1/1(Pt),600(Pt),16B,16A(Pt),603(Pt),602(Pt),738B/4B(Pt),610A/1A/1A,706B(Pt),827A/4A/2(Pt),827A/6,19E,701-B/1A/1/2,827A/1A(Pt),696PT(Pt),738B/1A(Pt),677B/1(Pt),21B(Pt),21C,20D,19D,25E,25D(Pt),692A/2/1B(Pt),690,692A/2/3/1(Pt)

Zone	Village	Ward	CTS number
ESZ-1	MAROL MAROSHI	P/S	1689(Pt), 1697(Pt), 1690(Pt)
ESZ-1	MULUND-W	T	1(Pt),33,34(Pt),29/3B(Pt),275(Pt),245(Pt),106 B/5(Pt),106B/2(Pt),197A(Pt),106B/3(Pt),1,233, 232,231,230,229,228,227,1B(Pt),106C,105,3F ,3E,3A(Pt),26A,26B,26C,26D,96,97,98,99,100, 101,102,203(Pt),204(Pt),205(Pt),206(Pt),207(Pt),208(Pt),209(Pt),211/2,210(Pt),211(Pt),212, 213,214,215,216,217,218,224,224/1,223,222, 221,220,219(Pt),115,114(Pt),112,111,110,109 ,108,91(Pt),92(Pt),93(Pt),94(Pt),95,197A(Pt),2 44,242,241,240,239,238,237,236,235,234,103 ,104,197(Pt),29/6(Pt),26(Pt),3B(Pt),245/2(Pt), 19/3(Pt),19/2(Pt),19/4,29/2(Pt),19/1,19/13,113 (Pt)
ESZ-1	NAHUR	S	469(Pt)
ESZ-1	NAHUR	T	28/4,28/3,28/2,469/3(Pt),9999,255,204(Pt),20 3(Pt),202(Pt),201(Pt),229(Pt),228(Pt),227(Pt), 226(Pt),225(Pt),224(Pt),223,26,26/1,26/2,27,8 /2,8/1,8,7/1,7,6,248,247,246,245,221,220,219, 218,217,216,254,253,252,251,250,249,28/6,2 8/5,22,23,24,25,13,12,11/1,11,10,9,28/16,28/1 5,28/14(Pt),28/13,28/12(Pt),28/11(Pt),28/10(Pt),28/9(Pt),28/8(Pt),28/7(Pt),258,257(Pt),260/3(Pt),14,13/1,233,232,231,230,256,222,16,15/5, 15/10,15/4,15/9,15/3,15/8,15/2,15/7,15/1,15/6, 15,215,244,243,242,241,240,239,238,237,236 ,235,234,422(Pt),28/1,28(Pt),17,18,19,5,20,20 /1,21,260A(Pt),260B/44(Pt),469/1(Pt),5(Pt)(Pt) ,5(Pt),469(Pt),243,234
ESZ-1	POISAR	R/C	809/A/1/1/1(Pt)
ESZ-1	POISAR	R/S	809A/1/18,809A/1/19/1/1/1D,824A/3(Pt),792/5 (Pt),809A/1/19B(Pt),874B/1(Pt),874C/10(Pt),8 09A/1/19A/1/1/1C/1(Pt),824A/2(Pt),874C/1(Pt) ,874C/3(Pt),874C/4(Pt),21(Pt),28(Pt),809A/1/1 9A/1/1/1/1A/1A(Pt),809A/1/19A/1/1/1C,874C/7 ,874C/8(Pt),809A/1/19A/1/7(Pt),824C/1(Pt),

10.8.1.2 List of Survey Number in ESZ 1 - MBMC

Zone	Village	Survey Number
ESZ-1	Mire	12(Pt), 13(Pt), 88(Pt), 9(Pt), 95(Pt), 96(Pt) 10(Pt), 11(Pt), 82(Pt), 83(Pt), 84(Pt), 85(Pt), 87, 91(Pt),98(Pt),93(Pt),94(Pt)
ESZ-1	Kashi	83(Pt), 94(Pt) 89(Pt),95(Pt)
ESZ-1	Ghodbunder	13(Pt), 17(Pt), 187(Pt), 193(Pt), 200(Pt), 203(Pt), 206(Pt), 241(Pt), Gaothan (Pt) 191, 198(Pt), 240,18(Pt),14(Pt)
ESZ-1	Versave	101(Pt), 105(Pt), 106(Pt), 107(Pt), 108(Pt), 109(Pt), 21(Pt), 36(Pt), Gaothan (Pt), 36(Pt), 42(Pt)

10.8.1.3 List of Survey Number in ESZ 1 - VT

Zone	Village	Survey Number
ESZ-1	Mori	PADA, GAVTHAN
ESZ-1	Poman	PADA

10.8.1.4 List of Survey Number in ESZ 1 - TMC

Zone	Village	Survey Number
ESZ-1	Boriwade	1/1(Pt),1/2,2/1(Pt),2/4(Pt),2/5(Pt),3(Pt),4/1(Pt),4/3(Pt),5/2,6/1,6/2,6/3(Pt),72(Pt),73/1(Pt),74(Pt),75(Pt),77(Pt),78(Pt),8/1(Pt),8/4,8/5(Pt),91/1(Pt),91/3(Pt),92(Pt),Gaothan,Road(Pt)
ESZ-1	Chitalsar manpada	57/1(Pt),57/2(Pt),57/3(Pt),58/1(Pt),59B(Pt),59C(Pt),59A/1P(Pt),59A/10(Pt),59A/11(Pt),59A/13,59A/16P(Pt),59A/18(Pt),59A/19(Pt),59A/2(Pt),59A/20,59A/27(Pt),59A/28(Pt),59A/3P,59A/4,59A/5P,59A/6(Pt),59A/7,59A/8,59A/9,70,71
ESZ-1	Kavesar	139(Pt),141(Pt),142(Pt),143(Pt),145(Pt),146(Pt),147(Pt),149(Pt),150(Pt),150(Pt),151(Pt),154(Pt),157(Pt),158(Pt),159,160(Pt),161(Pt),162(Pt),163(Pt),164(Pt),165(Pt),166(Pt),168(Pt),169(Pt),170(Pt),185(Pt),186(Pt),193(Pt),195(Pt),196(Pt),197,198,234(Pt), Road(Pt)
ESZ-1	Kolshet	100(Pt),106,107(Pt),108(Pt),109(Pt),111(Pt),112(Pt),114(Pt),285(Pt),291(Pt),99(Pt),Road(Pt)
ESZ-1	Majiwade	312,313,314(Pt),315(Pt),316,317,318,319,320(Pt),321,322,323(Pt),233(Pt),253(Pt),254(Pt),260(Pt),261(Pt),261(Pt),262(Pt),263(Pt),264(Pt),267(Pt),268(Pt),269,271(Pt),273(Pt),274(Pt),275(Pt),276(Pt),292(Pt),293(Pt),300(Pt),301(Pt),309(Pt),"338 P (418)(Pt)",350(Pt),380(Pt),407(Pt),421(Pt),Lake(Pt),Road(Pt)
ESZ-1	Owala	45/1,45/10(Pt),45/2,45/3,45/4,45/5,45/6(Pt),45/7,45/8/1,45/8/2,45/8/3,46/1(Pt),46/2(Pt),62/13(Pt),62/14(Pt),62/5(Pt),64/1,64/2(Pt),66/14(Pt),66/15,66/16(Pt),66/18,66/19,66/20,66/22,66/23,66/29(Pt)
ESZ-1	Pachpakhadi	157(Pt),158(Pt),159(Pt),160(Pt),163(Pt),263(Pt),264(Pt),265(Pt),266(Pt),267(Pt),270(Pt),285(Pt),286(Pt),287(Pt),288(Pt),289(Pt),291(Pt),371(Pt),373(Pt),423(Pt),430(Pt),431(Pt),432(Pt),520(Pt),Nala(Pt),Nursary(Pt)
ESZ-1	Wadwali	19 P(Pt), 19(Pt)
ESZ-1	Yeoor	2(Pt),4/7(Pt),45(Pt),46/2(Pt),Gaothan,Gurcharan(Pt)

10.8.2 List of CTS/ Survey Number in ESZ-2

10.8.2.1 List of CTS in ESZ 2 - BMC

Zone	Village	Ward	CTS number
ESZ-2	AAREY	P/N	1, 25,29

Zone	Village	Ward	CTS number
ESZ-2	AAREY	P/S	1/31(Pt),1/32(Pt),1/37,17(Pt),18,18/1,18/9999,19,19/1,2,2/1,20,20/3,20/4,21(Pt),23,24,24/1,24/2,25,25/34,25/7,26,27,28,28/1,29,29/13,29/17,29/2,29/21,45776,3,30,31,32,33,33/1,33/11,33/12,33/4,33/5,34/1,34/2,35(Pt),36(Pt),36/1,37(Pt),37/1,4(Pt),1/30(Pt),10,11,12,13,13/3,14,15,16,16/1,17/12,17/13(Pt),17/29,21,22,22/1,22/2,258/138,259,5(Pt),5/2,6,7,8,9
ESZ-2	AKURLI	R/S	171/1A/12(Pt),171/1A/21(Pt),171/1A/39(Pt),171/1A/41(Pt),171/1A/42,171/4B(Pt),174C(Pt),174E/1(Pt),174E/2(Pt)
ESZ-2	AKURLI	P/N	239/1(Pt)
ESZ-2	BHANDUP-W	S	2, 3(Pt), 8(Pt)
ESZ-2	BHANDUP-W	T	6(Pt), 1(Pt), 7(Pt),7/3,7/4
ESZ-2	DAHISAR	R/C	2220B/1B(Pt), 2220D(Pt), 2321A/1, 2220A/13(Pt), 2220A/1A(Pt), 2220A/1B(Pt), 2220A/1D(Pt)
ESZ-2	DAHISAR	R/N	3071(Pt),3072(Pt),3073(Pt),3074(Pt),3075(Pt),3077(Pt),3094A(Pt),3095(Pt),3104(Pt),3105(Pt),3106,3107A(Pt),3108(Pt),3118(Pt),2321A/1(Pt),2330A/1/1(Pt),2330B(Pt),2437(Pt),2445(Pt),2552(Pt),2553(Pt),2771(Pt),2772A(Pt),2772B,2772C,2772D(Pt),2776A(Pt),2776B(Pt),2776C(Pt),2776D,2781(Pt),2872/7(Pt),2875(Pt),2876,2877,2878,2879,2895,2896,2897,2903,2904,2905,2906,2907,2908,2909(Pt),2910(Pt),2912,2913,2916,2917,2918,2919,2921,2922,2923,2924,2925,2926,2927,2933,2934,2935(Pt),2936(Pt),2937(Pt),2971C(Pt),2976F,2979,2980,2981,2982,2983,9999
ESZ-2	DINDOSHI	P/S	93,81,83,82A,82B,83,86,92,91,89,87,90,94,96,95/4A,156 A/13A/4,84,156 A/13A/5
ESZ-2	GOREGAON	P/S	208(Pt), 209(Pt), 261, 262, 291, 292, 308, 318/12, 318/13, 318/14, 318/15, 318/9999, 318/16, 318/17, 292/10, 307/9, 307/10, 316, 302, 313, 271, 270, 261/3, 261/5, 261/6, 206, 208, 209, 207, 204, 203, 325, 290, 315, 280/31, 280/33, 280/53, 280/55, 280/44, 280/22, 280/23, 396/5, 323, 324, 285/7, 285/8, 285/9, 285/10, 280/20, 280/69, 280/65, 309, 307, 205, 285/11, 318, 318/1, 318/2, 318/3, 321, 292/15, 258/100, 266/1, 266/2, 268, 268/1, 268/2, 268/4, 285/1, 285/2, 285/3, 285/6, 311, 322, 319, 320, 268/3, 265/4, 265/5, 265/6, 265/1, 265/3, 265/7, 258/69, 298/3, 298/4, 298/5, 298/6, 298/7, 298/8, 298/13, 298/14, 280/41, 286/27, 286/28, 286/22, 314/11, 284, 285, 314, 297, 260, 280/15, 315/5, 265, 298/15, 298/17, 298/18, 298/19, 298/20, 298/21, 318/8, 318/9, 318/10, 307/3, 307/4, 307/5, 307/6, 307/7, 283, 261/9, 258/63, 265/20, 265/23, 286/11, 258(Pt), 314/12, 314/23, 314/21, 314/25, 314/26,

Zone	Village	Ward	CTS number
			314/27, 314/28, 314/30, 280/51, 280/50, 280/58, 280/59, 280/60, 280/62, 280/63, 265/16, 265/17, 265/18, 307/8, 265/10, 298/22, 298/16, 298/1, 297/4, 307/2, 280/64, 280/71, 280/72, 280/73, 280/77, 280/76, 202, 295, 282, 280, 293, 280/16, 280/18, 280/19, 280/75, 280/25, 280/26, 280/28, 280/29, 265/19, 265/2, 265/8, 265/9, 292/9, 292/11, 292/12, 292/13, 292/14, 264, 263, 269, 267, 266, 261/1, 278, 279, 315/6, 293/4, 273, 275, 274, 272, 281, 276, 296, 318/5, 318/6, 318/7, 292/16, 292/17, 292/18, 292/19, 292/20, 292/21, 292/22, 292/23, 294, 286, 288, 287, 289, 314/29, 289/1, 286/1, 286/7, 286/8, 286/9, 286/10, 286/14, 286/13, 286/18, 286/12, 286/15, 286/16, 286/17, 286/25, 286/24, 286/23, 286/26, 270/4, 270/6, 307/17, 307/18, 307/19, 307/21, 307/22, 307/23, 315/4, 315/1, 315/2, 314/4, 314/6, 314/13, 314/10, 314/9, 280/34, 280/36, 280/39, 280/37, 280/40, 280/46, 280/47, 280/48, 280/52, 312, 280/12, 280/78, 280/13, 298, 299, 300, 301, 303, 305, 306, 310, 261/4, 261/7, 261/8 258(Pt)
ESZ-2	GUNDHGAON	T	10 (124)(Pt),7(Pt),8(Pt)
ESZ-2	KANHERI	R/C	14AB(Pt),1927,520(Pt),521,522,523,525/2,525/3(Pt),525/4(Pt),525/5(Pt),525/6(Pt),536X,9999(Pt),544A(Pt),544B(Pt),559(Pt),
ESZ-2	KANJUR-W	S	1(Pt), 200(Pt), 203(Pt), 292(Pt), 202,201(Pt)
ESZ-2	KLERABAD	T	10,11,13_16,15 (188)(Pt),18(Pt),2,3,4,5,8,9
ESZ-2	MAGATHANE	R/C	168(34/B)(Pt),215(Pt),265,265X,168/13(Pt),168/8(Pt),
ESZ-2	MAGATHANE	R/S	168/13(Pt)
ESZ-2	MAJAS	K/E	182A/1(Pt),190A/1A/1(Pt),190A/1A/2(Pt),190A/1B(Pt)
ESZ-2	MALAD-E	P/N	51(Pt),52,53(Pt),54,55(Pt),57(Pt),58(Pt),59,600(Pt),602(Pt),603(Pt),604,605,607(Pt),610A/1A/1/1(Pt)(Pt),610A/1A/1/1(Pt)(Pt),610A/1A/1A(Pt),610A/1A/2C(Pt),626(Pt),63(Pt),64(Pt),65(Pt),66(Pt),67,68(Pt),689,692A/1/1A(Pt),692A/1/1B,693(Pt),694,695,696(Pt)PT,697(Pt),70(Pt),700(Pt),700/1,738B/1A(Pt),827A/4A(Pt),827A/4A/1(Pt),827A/4B
ESZ-2	MALAD-E	P/S	625, 626A(Pt)
ESZ-2	MAROL MAROSHI	P/S	1627,1681(Pt),1677(Pt),1680(Pt),1680/1,1680/2,1680/3,1680/4,1683,1684,1685,1686,1687,1688,1689(Pt),1690(Pt),1691,1692,1693,1694,1695,1695/1,1696,1697(Pt)
ESZ-2	MULUND-W	T	1(Pt),106B/1,106B/2(Pt),106B/5(Pt),106B/6,113,19/1(Pt),19/3(Pt),219(Pt),29(Pt),29/3A(Pt),29/4,29/5,30,3B/1,3B/1,3D
ESZ-2	NAHUR	S	481(Pt), 480
ESZ-2	NAHUR	T	257(Pt),260/3(Pt),469/1(Pt),469/3(Pt)

Zone	Village	Ward	CTS number
ESZ-2	PAHADI GOREGAON	P/S	128,588,589
ESZ-2	PASPOLI	S	1,2,27A(Pt),27B(Pt),27C(Pt),27D(Pt),28(Pt),28/1,29,29(Pt),30,30(Pt),31(Pt),31/1(Pt),32(Pt),33,67/A,67/B,67/B (PART)(Pt),68
ESZ-2	POISAR	R/S	21(Pt),792/521(Pt),809A/1/19A/1/1/1/1A/1A21(Pt),809A/1/19A/1/1/1C,809A/1/19A/1/1/1C/121(Pt),809A/1/19A/1/1/1C/2,824A/321(Pt),824A/4,874B/121(Pt),874B/121(Pt),874B/221(Pt),874B/221(Pt),874C/1521(Pt),874C/821(Pt)
ESZ-2	PRAJAPUR	K/E	1(Pt),11(Pt),13(Pt),14(Pt),2(Pt),3(Pt),4,5,6,7,7/10,7/11,8(Pt)
ESZ-2	SAAI	P/S	24
ESZ-2	SAAI	T	1(19)(Pt),10(Pt),10/99,12,13,14,15,16,17,18,19,2,20,21,22,23,26,27,28,29,3,30,31,32,33,34,35,36,37,38,39,4,40,41,42(Pt),43(Pt),5,6,7,8,9
ESZ-2	VYARAVLI	K/E	1(Pt), 2

10.8.2.2 List of Survey Number in ESZ 2 - MBMC

Zone	Village	Survey Number
ESZ-2	Mire	12(Pt), 13(Pt), 7(Pt), 8(Pt), 9(Pt), 6(Pt)
ESZ-2	Kashi	100(Pt),101,102(Pt),103(Pt),43(Pt),44(Pt),45(Pt),47(Pt),50(Pt),52(Pt),53,54(Pt),55(Pt),58(Pt),59(Pt),60(Pt),61(Pt),62,63,64(Pt),65,66,68(Pt),69(Pt),70(Pt),77(Pt),78(Pt),79(Pt),80,82,83(Pt),94(Pt),95(Pt),96(Pt)
ESZ-2	Ghodbunder	157(Pt),172(Pt),173,174(Pt),176(Pt),177,178(Pt),180(Pt),182(Pt),183(Pt),184,185(Pt),186,187(Pt),188,193(Pt),199(Pt),200,202,203(Pt),205(Pt),215,216(Pt),235,236,237,241(Pt),244(Pt),Gaothan(Pt)
ESZ-2	Versave	10,101(Pt),102,103,105(Pt),108(Pt),11,13,14,15,16(Pt),2,21(Pt),27(Pt),28(Pt),29(Pt),3(Pt),34(Pt),5(Pt),52(Pt),53(Pt),56(Pt),57,58,59,6,60,61,62,63,64,65,66,67,68,69,7,70,71,72(Pt),77,78,79,80(Pt),85(Pt),86(Pt),87(Pt),88,89,9(Pt),90,91,GAOTHAN(Pt)
ESZ-2	Chenne	101(Pt),102,103,104,105,106,107,108,109,110,111,112,113,114,115,116,117,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144(Pt),145,146,147,148(Pt),149,150,151,152,26(Pt),38,39,4(Pt),40,41,42,43,46,47,48(Pt),49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,72,73,74,75,76,77,77,78,79,80,81,82,83,84,85,86,87,88,90,91,93,94,95,96,97,98,"KESARI PADA",PADA

10.8.2.3 List of Survey Number in ESZ 2 - VVCMC

Zone	Village	Survey Number
ESZ-2	Juchandra	133(Pt), 134, 135, 143, 148
ESZ-2	Malajipada	312/C,73,79,80A/1,4A(Pt),8C,Gaothan

ESZ-2	Sasunawaghar	1(Pt),10,11(Pt),114(Pt),12(Pt),13(Pt),14(Pt),148(Pt),151(Pt),153(Pt),154,155,156(Pt),157(Pt),18(Pt),19(Pt),2(Pt),20(Pt),203(Pt),21(Pt),22,23(Pt),25,26,27,28,29,3,30,31,310(Pt),32,33,34,35,351(Pt),356,357(Pt),359,36,37,38,39,4,40,41,42,43,44,45,46,47,48,49,5,50,51,52,53,54,55,56,57,57,6,7,70(Pt),77(Pt),78,79,8,80,81,82,83,84,85,86,87,88,89,9,90,91,96,97,Gaothan(Pt),Pada Gwalada,Pada Karnala

10.8.2.4 List of Survey Number in ESZ 2 – Vasai Taluka

Zone	Village	Survey Number
ESZ-2	Kaman	147, 148, 149, 99
ESZ-2	Mori	1(Pt),10(Pt),11,12,13,14,15,16,17,18,19,2,20,21(Pt),22,23,24,25,26,27,28,29,3,30,31,32,33,34,35,36,37(Pt),38(Pt),39(Pt),4,40,41,42,43(Pt),44,45,45,46,47,48,49,5,50,51,52,53,53,54,55,56,57,58,59/1,59/10,59/11,59/11,59/12,59/13,59/15,59/16,59/17,59/18,59/2,59/20,59/21,59/22,59/23,59/3,59/4,59/5,59/7,59/8,59/9,6,62/1,62/2(39),62/3,64/1,64/2,64/3,64/4,64/5,64/6,64/7,67,68,7/1,7/2,7/3,7/4,7/5,7/6,8,9,PADA,146A(Pt)
ESZ-2	Nagle	10(Pt),11,14(Pt),15(Pt),16(Pt),20(Pt),21(Pt),22,23,24(Pt),25(Pt),29(Pt),30(Pt),32(Pt),33(Pt),34(Pt),35(Pt),37,38,39,4(Pt),43,5,59,65(Pt),66(Pt),67,69,70,92(Pt)
ESZ-2	Poman	160,161,162,163,164,165,166,167,168,169,170,171,172,173,174,175,176,177,178,179,180,181,182,183,184,185,186,187,188,211,212,214,215,217,219,220,221,222,223,247
ESZ-2	Sarjamori	98(Pt)
ESZ-2	Shilottar	1, 10, 21, 3, 4, 5, 6
ESZ-2	Creek	Null
ESZ-2	River	Null

10.8.2.5 List of Survey Number in ESZ 2 - TMC

Zone	Village	Survey Number
ESZ-2	Boriwade	1/1(Pt),1/2(Pt),2/2,2/3,2/4(Pt),2/5(Pt),3(Pt),4/1(Pt),4/2,4/3(Pt),78(Pt),81/1,81/2,83/3(Pt),83/4(Pt),83/4 P(Pt),83/5,83/6,83/7(Pt),83/7 P,83/8,83/8 P,84/2,84/3,86/2,89,90,91/1(Pt),91/2(Pt),91/3(Pt),92(Pt),Gaothan(Pt)
ESZ-2	Chitalsar manpada	57/2(Pt),57/3(Pt),57/4(Pt),59 B(Pt),59 C(Pt),59A/1 P(Pt),59A/10(Pt),59A/16 P(Pt),59A/16 P(Pt),59A/16 P(Pt),59A/18(Pt),59A/19(Pt),59A/2(Pt),59A/27(Pt),59A/28(Pt),59A/3 P(Pt),59A/6(Pt),59A/9(Pt),71(Pt)
ESZ-2	Kavesar	142(Pt),143(Pt),145(Pt),146(Pt),147(Pt)149(Pt),150(Pt),154(Pt),158(Pt),160(Pt),162(Pt),170(Pt)

ESZ-2	Kolshet	100(Pt), 112(Pt),113(Pt) 114(Pt), 291(P7), 99(Pt)
ESZ-2	Majiwade	314(Pt),315(Pt),317(Pt),318(Pt),321(Pt),323(Pt), 253(Pt),254(Pt),260(Pt),261(Pt),263(Pt),267(Pt),267(Pt),268(Pt),273(Pt),274(Pt),276(Pt),301(Pt),350(Pt),358(Pt),407(Pt),421(Pt),Lake(Pt),Road(Pt)
ESZ-2	Owala	27(Pt),28/1(Pt),28/2(Pt),28/3(Pt),28/4(Pt),28/5(Pt),42/1,42/2(Pt),42/3(Pt),42/4(Pt),42/5(Pt),42/6(Pt),43/1(Pt),43/2,43/3(Pt),44(Pt),45/12,45/6(Pt),45/7(Pt),46/1(Pt),46/2(Pt),47/1(Pt),47/2,49/2(Pt),62(Pt),62/13(Pt)
ESZ-2	Pachpakhadi	158(Pt),159(Pt),160(Pt),265(Pt),266(Pt),373(Pt),432(Pt),520(Pt),Nursary(Pt),Road(Pt)
ESZ-2	Wadwali	19 P(Pt), 19(Pt)
ESZ-2	Yeoor	14(Pt), 2(Pt), 20(Pt), 21(Pt), 39(Pt), 4/7(Pt), 40(Pt), 41(Pt), 42/1(Pt), 42/2(Pt), 45, 51/1 P(Pt), Blank(Pt), Gaothan(Pt), Gurcharan(Pt), Road(Pt), 10/1, 10/2, 10/3, 10/4, 11, 12/2, 12/2 P, 13, 15, 16, 17, 18/1, 18/2, 18/3, 19/1, 19/2, 20pt, 21, 22/1, 22/10, 22/2, 22/3, 22/5, 22/6, 22/7, 22/8, 22/9, 23/4, 24/1, 24/2, 24/3, 24/4, 24/5, 24/6, 24/7, 24/8, 24/9, 25, 26/1, 26/2, 26/3, 27, 28, 28/1, 28/2, 28/3, 28/4, 29, 3/1, 3/2, 30, 31/1, 31/2, 31/4, 31/5, 31/6, 32, 33, 34/1, 34/2, 35/1, 35/2, 35/3, 36, 38, 4/1, 4/2, 4/3, 4/4, 4/5, 4/6, 4/8, 4/9, 43, 44/1, 44/2, 44/3, 44/4, 46/1, 46/2, 47/1, 47/2, 47/3, 47/4, 48, 49/1, 49/2, 4pt, 5/5, 50, 50/3, 50pt, 51/1, 51/2, 6/1, 6/2, 6/5, 6/7, 6/8, 7/1, 7/10, 7/11, 7/12, 7/13, 7/14, 7/15, 7/16, 7/17, 7/18, 7/19, 7/2, 7/3, 7/4, 7/5, 7/6, 7/7, 7/7 P, 7/8, 7/9, 9, 9/1, Blank, Nala, Pada
ESZ-2	Bhaindar pada	15(Pt),17P(Pt),18,19,19P,20,23/1,23/10,23/11,23/12,23/13,23/14,23/2,23/3(Pt),23/4(Pt),23/5,23/6(Pt),23/7,23/8,23/9,56/1/C(Pt),56/13,56/14,56/4(Pt),56/7(Pt),56/8(Pt),56/9(Pt),56pt,57pt(Pt),58/1(Pt),58/2,58/3,58/4,58/5,58/6,58/7,58/8,59,59/1(Pt),59/2(Pt),59pt(Pt),59pt,60/1,60/10,60/11,60/12,60/13,60/14,60/15,60/16,60/2,60/4,60/6,60/7A,60/7B,60/8,60/9,61,62(Pt),63/1(Pt),71/1,71/2,72/1(Pt),72/2(Pt),72/3(Pt),72/4,74/1(Pt),74/2(Pt),75(Pt),75/1,75/2,76/2(Pt),76/3,77/1,77/10(Pt),77/11,77/12,77/14/1,77/14/2(Pt),77/15(Pt),77/16(Pt),77/17(Pt),77/18(Pt),77/2,77/20(Pt),77/21(Pt),77/3,77/4,77/5,77/7,77/8(Pt),77/9,77PT,77PT(Pt),79/6(Pt),82/1,82/2,82/3,83/1,83/2,83/3(Pt),84,85/1,85/2,86,87/1,87/2,87/3,87/4,87/5,87/6,88/1(Pt),88/2(Pt),Khadi(Pt),Lake,Road(Pt),Road

10.8.3 List of CTS / Survey Number in ESZ-3

10.8.3.1 List of Survey Number in ESZ 3 - MBMC

Zone	Village	Survey Number
ESZ-3	Versave	101(Pt),105(Pt),106(Pt),107(Pt),108(Pt),109(Pt),15(Pt),16(Pt),21(Pt),28(Pt),29(Pt),30,31,32,33,34(Pt),GAOTHAN(Pt)
ESZ-3	Chenne	11,12,13,14,144(Pt),148(Pt),15,16,17,18,19,20,21(Pt),22(Pt),23,24,25,26(Pt),4(Pt),5,6,9

10.8.3.2 List of Survey Number in ESZ 3 - VVCMC

Zone	Village	Survey Number
ESZ-3	Juchandra	91(Pt),90(Pt)5(Pt),103(Pt).102(Pt),104(Pt),92(Pt),5(Pt)
ESZ-3	Malajipada	76(Pt), 80A/1, 4A(Pt), 77
ESZ-3	Sasunawaghar	1,11,114,12,13(Pt),134,135,14(Pt),141,146,147,15(Pt),155,156,157,16(Pt),18,19,20,203,21,22,23,59(Pt),60(Pt),61(Pt),62(Pt),63(Pt),64(Pt),65(Pt),66(Pt),67(Pt),68(Pt),69(Pt),70,77,Pada

10.8.3.3 List of Survey Number in ESZ 3 - VT

Zone	Village	Survey Number
ESZ-3	Creek	Null
ESZ-3	Nagle	65(Pt), 73(Pt), 92(Pt), 6, 7, 72(Pt)
ESZ-3	River	Null

10.8.3.4 List of Survey Number in ESZ 3 - TMC

Zone	Village	Survey Number
ESZ-3	Bhaindar pada	17(Pt), 17P(Pt), Khadi(Pt), Road(Pt)

10.8.4 List of Survey Numbers in Area for Eco Tourism Development Potential

10.8.4.1 List of Survey Number in Area for Eco Tourism Development Potential - MBMC

Zone	Village	Survey Number
Area for Eco Tourism Development Potential	Chenne	102,103,104,105,106,107,108,109,110,111,112,113,114,115,116,117,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,135,136,137,138,139,140,141,142,143,144(Pt),145,146,147,148(Pt),149,150,151,152,4(Pt),5(Pt),90,91,93,94,95,96,97,98,"PADA

10.8.4.2 List of Survey Number in Eco Tourism Development Potential - TMC

Zone	Village	Survey Number

Area for Eco Tourism Development Potential	**Yeoor**	2, 4/7, 45, 46/2, Gaothan, Gurcharan, 14, 2, 20, 21, 39, 4/7, 40, 41, 42/1(Pt), 42/2, 45, 51/1, P, Null, Gaothan, Gurcharan, Road, 10/1, 10/2, 10/3, 10/4, 11, 12/2, 12/2 P, 13, 15, 16, 17, 18/1, 18/2, 18/3, 19/1, 19/2, 20pt, 21, 22/1, 22/10, 22/2, 22/3, 22/5, 22/6, 22/7, 22/8, 22/9, 23/4, 24/1, 24/2, 24/3, 24/4, 24/5, 24/6, 24/7, 24/8, 24/9, 25, 26/1, 26/2, 26/3, 27, 28, 28/1, 28/2, 28/3, 28/4, 29, 3/1, 3/2, 30, 31/1, 31/2, 31/4, 31/5, 31/6, 32, 33, 34/1, 34/2, 35/1, 35/2, 35/3, 36, 38, 4/1, 4/2, 4/3, 4/4, 4/5, 4/6, 4/8, 4/9, 43, 44/1, 44/2, 44/3, 44/4, 46/1, 46/2, 47/1, 47/2, 47/3, 47/4, 48, 49/1, 49/2, 4pt, 5/5, 50, 50/3, 50pt, 51/1, 51/2, 6/1, 6/2, 6/5, 6/7, 6/8, 7/1, 7/10, 7/11, 7/12, 7/13, 7/14, 7/15, 7/16, 7/17, 7/18, 7/19, 7/2, 7/3, 7/4, 7/5, 7/6, 7/7, 7/7 P, 7/8, 7/9, 9, 9/1, Blank, Nala, Pada

10.8.5 List of CTS/ Survey Number in Immediate Impact Area of Human Animal Conflict

10.8.5.1 List of CTS Number in Immediate Impact Area of Human Animal Conflict - BMC

Zone	Village	Ward	CTS number
ESZ-2	AAREY	P/S	1(Pt), 12(Pt), 14(Pt), 16(Pt), 16/1(Pt), 17, 17/12, 17/13, 17/29, 18, 18/1, 18/9999, 19, 19/1, 20, 20/3, 20/4, 21, 22, 22/1, 22/2, 23, 24, 24/1, 24/2, 25(Pt), 25/34, 25/7, 258/138, 259(Pt), 26(Pt), 27(Pt), 277, 28, 28/1, 29, 29/13, 29/17, 29/2, 29/21, 29/4, 30, 31, 32, 33, 33/1, 33/11, 33/12, 33/4, 33/5, 34/1, 34/2, 35, 36, 36/1, 37, 37/1, 39, 4(Pt), 5(Pt), 5/1, 6(Pt), 7(Pt), 8(Pt), 9(Pt)
ESZ-2	AAREY	P/N	29, 25 (Pt)
ESZ-2	AKURLI	P/N	Null
ESZ-2	GOREGAON	P/S	258(Pt), 258/63, 260, 261, 261/1, 261/3, 261/4, 261/5, 261/6, 261/7, 261/8, 261/9, 262, 263, 264, 270(Pt), 271(Pt), 272(Pt), 274(Pt), 275, 276, 278, 279, 281, 282, 283, 284, 285, 285/1, 285/10, 285/11, 285/2, 285/3, 285/6, 285/7, 285/8, 285/9, 286, 286/1, 286/10, 286/11, 286/12, 286/13, 286/14, 286/15, 286/16, 286/17, 286/18, 286/22, 286/23, 286/24, 286/25, 286/26, 286/27, 286/28, 286/7, 286/8, 286/9, 287(Pt), 288(Pt), 289(Pt), 289/1(Pt), 311, 312, 313, 314, 314/10, 314/11, 314/12, 314/13, 314/21, 314/23, 314/25, 314/26, 314/27, 314/28, 314/29, 314/30, 314/4, 314/6, 314/9, 315, 315/1, 315/2, 315/4, 315/5, 315/6, 316, 318, 318/1, 318/10, 318/12, 318/13, 318/14, 318/15, 318/16, 318/17, 318/2, 318/3, 318/5, 318/6, 318/7, 318/8, 318/9, 318/9999, 319, 320, 321, 322(Pt), 396/5
ESZ-2	MALAD-E	P/N	827A/4A(Pt)
ESZ-1	MAROL MAROSHI	P/S	1689(Pt)
ESZ-2	MAROL MAROSHI	P/S	1627(Pt), 1689(Pt), 1680/4, 1680/2, 1680/3, 0(Pt), 1680(Pt), 1678, 1627(Pt), 1681(Pt), 1677(Pt), 1681/5, 1680/1, 1681/4, 1681/3, 1682(Pt), 1685(Pt), 1686(Pt)
ESZ-2	DINDOSHI	P/S	Null
ESZ-2	PRAJAPUR	K/E	3(Pt)
ESZ-1	NAHUR	T	260B/43(Pt), 469/2(Pt)
ESZ-2	SAAI	T	1(Pt), 15(Pt), 14(Pt)

10.8.5.2 List of Survey Number in Immediate Impact Area of Human Animal Conflict - MBMC

Zone	Village	Survey Number MBMC
ESZ-2	Chenne	101, 52, 66, KESARI PADA, 79, 89(Pt), 42(Pt), 43(Pt), 41, 38(Pt), 40(Pt), 39, 70, 69, 77, 67, 68, 57, 74, 55, 64, 53, 54, 72, 75, 73, 65, 83(Pt), 63, 81(Pt), 82(Pt), 78, 80, 76, 84(Pt),

Zone	Village	Survey Number MBMC
		86, 85, 88(Pt), 87(Pt), 59(Pt), 60(Pt), 26(Pt), 51(Pt), 47, 50, 49, 46(Pt), 62, 48(Pt), 58(Pt), 61(Pt), 99(Pt), 56, 96(Pt), 97, 94, 95, 120, 119, 115, 111, 121, 150, 151, 145, 146, 112, 140, 106(Pt), 109, 107, 110, 126, 127(Pt), 98, PADA, 91,93,4,90,149,92,144,148(Pt),152,147,117,102,120, 104,105,113,103, 123,116,114,122,124,145,146,125,139,108, 101, 131, 132, 133, 134, 130, 129, 128, 127, 137, 136, 34, 135, 138, 143, 142, 141, 4, 14, 11, 7, 10
ESZ-3	Chenne	9(Pt), 16, 11(Pt), 12, 18, 17(Pt), 13, 15, 14(Pt), 5(Pt), 6(Pt), 7(Pt), 8(Pt), 9(Pt), 148(Pt), 144(Pt)
Area for Eco Tourism	Chenne	102,103,104,105,106,107,108,109,110,111,112,113,114,115,116,117,119,120,121,122,123,124,125,126,127,139,14(Pt),140,144,145,146,147,148,149,150,151,152,4(Pt),5(Pt),89,90(Pt),91,92,93,94,95,96,97,98,PADA
ESZ-1	Ghodbunder	191, 198(Pt), 13(Pt), 17(Pt), 14(Pt), 18(Pt), 240, 19(Pt), 193(Pt), 206(Pt), Gaothan(Pt), 241(Pt), Null
ESZ-2	Ghodbunder	237, 202, 235, 203(Pt), 200, Gaothan(Pt), 244, 0(Pt), 205, 236, 174(Pt), 185(Pt), 215(Pt), 177(Pt), 178(Pt), 180(Pt), 191(Pt), 172(Pt), 176(Pt), 216(Pt), 173(Pt)
ESZ-2	Kashi	52(Pt), 47(Pt), 54(Pt), 53(Pt), 102(Pt), 96(Pt), 60(Pt), 55(Pt), 58(Pt), 45(Pt), 77(Pt), 66(Pt), 78(Pt), 69(Pt), 68(Pt), 80(Pt), 103(Pt), 79(Pt), 43(Pt), 44(Pt)
ESZ-1	Versave	105(Pt), 108(Pt), GAOTHAN(Pt)
ESZ-2	Versave	2(Pt), 3(Pt), 5(Pt), 33(Pt), 34(Pt), 52(Pt), 53(Pt), 55(Pt), 56(Pt), 57(Pt), 58(Pt), 59(Pt), 64(Pt), 65(Pt), 66, 67, 68, 69, 70(Pt), 71, 72(Pt), 76(Pt), 77(Pt), 78, 79, 80(Pt), 85(Pt), 86, 87(Pt), 88, 89, 90, 91, 101(Pt), 102, 103(Pt), 107(Pt), 109(Pt)
ESZ-3	Versave	33(Pt), 107(Pt), 109(Pt)

10.8.5.3 List of Survey Number in Immediate Impact Area of Human Animal Conflict - VVCMC

Zone	Village	Survey Number VVCMC
ESZ-2	Sasunavghar	155(Pt), 156(Pt), 157(Pt), 161, 203, 25, 26, 27, 28, 29, 30, 31, 32, 33(Pt), 34, 35(Pt), 36(Pt), 37(Pt), 39(Pt), 40(Pt), 41, 42, 43, 44, 45, 46, 47(Pt), 48(Pt), 51(Pt), 52(Pt), 53(Pt), 54(Pt), 55, 56, 57, Pada Gwalada
ESZ-3	Sasunavghar	156(Pt), 157(Pt)

10.8.5.4 List of Survey Number in Immediate Impact Area of Human Animal Conflict – Vasai Taluka

Zone	Village	Survey Number VVCMC
ESZ-2	Shillotar	1(Pt), 10(Pt), 21(Pt), 23, 3, 4, 5(Pt), 6, Talav
ESZ-2	Mori	45(Pt), 59/16(Pt), 59/17(Pt), 64/1(Pt), 64/2(Pt), 64/3(Pt), 64/4(Pt), 64/5, 64/6, 64/7, 66 (165)
ESZ-2	Nagle	25(Pt), 29(Pt), 30(Pt), 32(Pt), 33(Pt), 34(Pt), 35(Pt), 37(Pt), 38(Pt), 39(Pt), 43(Pt), 59(Pt), 66(Pt), 73(Pt)
ESZ-3	Nagle	Creek(Pt)
ESZ-1	Poman	PADA

Zone	Village	Survey Number VVCMC
ESZ-2	Poman	160, 162, 163, 164, 165, 166, 167, 168(Pt), 169(Pt), 170, 171, 172, 173, 174(Pt), 176(Pt), 177(Pt), 247

10.8.5.5 List of Survey Number in Immediate Impact Area of Human Animal Conflict - TMC

Zone	Village	Survey Number TMC
ESZ-2	Bhaindar pada	87/4, 87/5, 88/1(Pt), 90/2(Pt), 81/3(Pt), 84(Pt), 87/6, 86, 85/1, Lake, 87/1, 87/2, 85/2, 87/3(Pt), 88/2(Pt), 22(Pt)
ESZ-1	Boriwade	10(Pt)
ESZ-1	Chitalsar manpada	71(Pt), 59 C(Pt)
ESZ-2	Chitalsar manpada	59A/1 P(Pt), 59A/6(Pt)
ESZ-1	Kolshet	Road(Pt)
ESZ-2	Kolshet	321, 291(Pt)
ESZ-1	Majiwade	255(Pt),256(Pt),321(Pt), 319(Pt), 320(Pt), 318(Pt)
ESZ-2	Majiwade	42/1, 291(Pt)
ESZ-2	Owala	28/1(Pt), 27(Pt), 28/3(Pt)
ESZ-1	Pachpakhadi	Nursary(Pt), 519(Pt), 263(Pt), 431(Pt), 265(Pt), 423(Pt), 430(Pt), 432(Pt)
ESZ-2	Yeoor	3/1, 3/2, 4/2, 4/3, 4/4, 4/5, 4/6, 4/8, 4/9, 4pt, 5/5, 6/1, 6/2, 6/5, 6/7, 6/8, 7/1(Pt), 7/2, 7/3, 7/4, 7/5, 7/6(Pt), 7/7, 7/7 P, 7/8, 7/9, 7/10, 7/11, 7/12, 7/13, 7/15, 7/16, 7/17, 7/18, 7/19, 9(Pt), 9/1, 10/1, 10/2, 10/3, 10/4, 11, 12/2 P, 12/2(Pt), 13(Pt), 14(Pt), 17, 18/1, 18/2, 18/3, 19/2, 20, 20pt, 21, 22/1, 22/2, 22/3, 22/5, 22/6, 22/7, 22/8, 22/9, 22/10, 23/4, 24/6, 24/7, 24/8, 24/9, 25, 26/1, 26/2, 26/3, 27, 28, 28/1, 28/2, 28/3, 28/4, 29, 30, 31/1, 31/2, 31/4, 31/5, 31/6, 32, 33, 34/1, 34/2, 35/1, 35/2, 35/3, 36, 38 P(Pt), 39 P(Pt), 39(Pt), 40(Pt), 41(Pt), 42/1(Pt), 42/2, 43, 44/1(Pt), 44/2, 44/4, 46/1, 47/1, 47/2, 47/3, 47/4, 48, 49/1, 49/2, 50, 50/3, 51/1, 51/1 P(Pt), 51/2, Blank, Lake(Pt), Nala, Nala(Pt), Pada, Road(Pt)
Area for Eco Tourism Development Potential	Yeoor	15(Pt), 13(Pt), 14(Pt), 12/2(Pt), 34/1,32,31/1,31/4,31/6,31/2,31/1,50,49/1,4pt,28,29, 26/1,28,22/7,48,28/4,28/3,26/3,25,22/5,22/6,26/2,22/8,24/4,27,24/7,24/5,24/8,24/1,20,30,22/1,22/3,23/4,22/2,49/2,18/3,16,18/2,19/1,19/2,18/1,10/3,6/7,10/4,6/8,6/1,6/2,Pada,10/2,24/9,11,10/3,47/3,47/4,7/9, 20pt,7/8,Blank,7/2,47/1,Blank,6/5,Nala,7/3,40,43,38,51/1,44/4,51/2,45,Gaothan,42/2,44/3,46/1,46/2,3/2,4/8,28/2,3/1,4/6,5/5,4/4,4/5,4/2,44/2,50pt,4/3,Gaothan,7/13,7/11,7/14,7/16,7/10,47/2,7/19,7/15,7/17,4/1,7/6,7/18,4/9,7/7 P,35/3,41,10/1,36,2,7/5,7/12,7/1,9,12/2 P,4/7,Road,39 P,51/1 P,50/3,21,Road,106,24/2,9/1,Road,39,Gurcharan,38 P,Nala,7/7,42/1,17,44/1,22/10,22/9,34/2,33,28/1,35/2,7/4,24/3,24/6,35/1,31/5

10.9 Annexure-IX-Record of Human Animal Conflict procured during Data collection

10.9.1 List for Human Animal Conflict in BMC

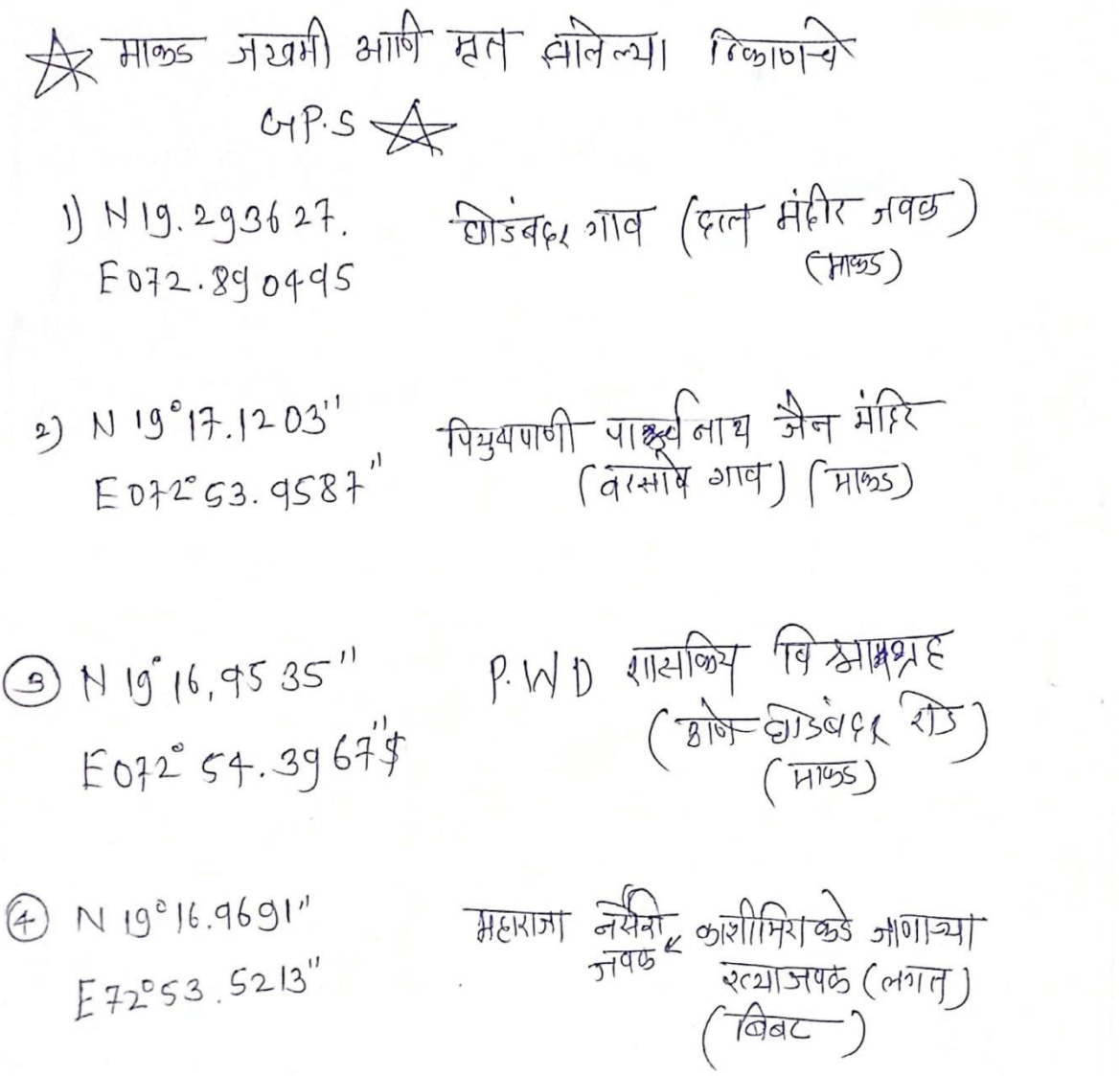
बिबट्याच्या हल्ल्यात जखमी / मृत झालेल्यांच्या नावांची यादी

अ.क्र.	सन	दिनांक व वेळ	मृत अथवा जखमी व्यक्तीचे नाव	हल्ला झाल्याचे ठिकाण	शेरा
14	2012	09.01.2012 सायं. 07.00 वाजता	श्री. मुस्ताक हसन नागोरी वय 30 वर्षे	न्युझीलंड हॉस्टेल जवळील बस स्टॉप	बिबट्याच्या हल्ल्यात किरकोळ जखमी. खर्चाची बीले सादर केली नाही.
15	2012	15.07.2012 रोजी रात्री 11.55 वाजता	कु. संजना ज्ञानेश्वर थोरात, वय 6 वर्षे	शंकर टेकडी, शास्त्रीनगर, मुलुंड	बिबट्याच्या हल्ल्यात मृत. संजय गांधी राष्ट्रिय उद्यानाच्या हद्दीत असल्याने नुकसान भरपाई देता येत नाही.

16	2012	02.11.2012 रोजी रात्री 10.00 त 10.30 चे दरम्यान	श्रीमती सिताबाई नवश्या पागे, वय 55 वर्षे	मरोशी पाडा, आरे मिल्क कॉलनी, गोरेगांव	बिबट्याच्या हल्ल्यात मृत. दिनांक 21.10.2013 रोजी रू. 2.00 लक्ष चा धनादेश दिला.
17	2012	17.11.2012 रोजी 10.30 ते 11.00 चे दरम्यान	कु. उषा विनय यादव, वय वर्षे अडीच	आदिवासी गावठाण, चाफ्याचा पाडा, टेंबीपाडा, भांडुप (प.)	बिबट्याच्या हल्ल्यात मृत. दिनांक 16.03.2013 रोजी रू. 2.00 लक्ष चा धनादेश दिला.
18	2012	06.12.2012 रोजी पहाटे	श्री. ॲन्थोनी व्ही. के. (फर्नांडीस), वय 55 वर्षे	भांडुप संकुल, एस.एम.सी. प्लॉट	बिबट्याच्या हल्ल्यात मृत. वारसाने कागदपत्र सादर न केल्याने नुकसान भरपाई देण्यात आलेली नाही.
19	2013	01.01.2013 रोजी पहाटे 06.00 वाजता	श्री. विनोद रामचंद्र हाडोळ, वय 18 वर्षे	मरोशी पाडा, आरे मिल्क कॉलनी, गोरेगांव	बिबट्याच्या हल्ल्यात किरकोळ जखमी. खर्चाची बीले सादर केली नाही.
20	2013	06.01.2013 रोजी सायं. 06.30 ते 07.00 चे दरम्यान	श्रीमती सविता संतोष वरठे, वय 25 वर्षे	खांब्याचा पाडा, आरे कॉलनी, युनिट नं.25, गोरेगांव	बिबट्याच्या हल्ल्यात जखमी. शासकिय रूग्णालयात उपचार केल्याने खर्चाची बीले सादर केली नाही.
21	2013	26.01.2013 रोजी सायं. 07.30 वाजता	कु. सौरभ ठाकुरदीन, वय 12 वर्षे	आदर्श नगर, आरे मिल्क कॉलनी, गोरेगांव	बिबट्याच्या हल्ल्यात मृत. दिनांक 21.10.2013 रोजी रू. 2.00 लक्ष चा धनादेश दिला.
22	2013	01.10.2013 रोजी सकाळी 06.30	कु. हिया पीटर मसी, वय 4 वर्षे	खडकपाडा, आरे कॉलनी, गोरेगांव	बिबट्याच्या हल्ल्यात मृत. (सदर मयताच्या वारसांस रू. 1.00 लक्ष चा धनादेश दिनांक 03.10.2013 रोजी अदा करण्यांत आला) तसेच रू. 4.00 लक्षचा धनादेश अदा करण्यांत आला.
23	2013	01.10.2013 रोजी सायं. 6.15	सुनिल राजेश भोवर, वय 11 वर्षे	नवापाडा, युनिट नं.19, आरे मिल्क कॉलनी, गोरेगांव (पूर्व)	बिबट्याच्या हल्ल्यात गंभीर जखमी झाल्याने. रू. 1.00 लक्ष चा धनादेश दि.21.10.2013 रोजी देण्यांत आला.
24	2013	18.10.2013 रोजी सायं. 5.30	प्रकाश संतोष साळुके वय 12 वर्षे	मटईपाडा, गोरेगांव (पुर्व), मुंबई	बिबट्याच्या हल्ल्यात मृत. (सदर मयताच्या वारसांस रू. 1.00 लक्ष व रू. 4.00 लक्षचा चा धनादेश अदा करण्यांत आला.
25	2014	निरंक	निरंक	निरंक	-
26	2015	निरंक	निरंक	निरंक	-
27	2016	निरंक	निरंक	निरंक	-
28	2017	20.03.2017 रोजी रात्री 21.00 वा.	प्रणय वासुदेव रिंजड, वय 3 वर्षे	चाफ्याचा पाडा, गोरेगांव	बिबट्याच्या हल्ल्यात किरकोळ जखमी. रक्कम रु. 15000/- धनादेश क्र. 677289 दि. 29.04.2017 अन्वये अदा केली.

29	2017	08.05.2017	दर्षणी मुथ्थुवेल, वय 4 वर्षे	युनिट क्र. 13, गोरेगांव	मृत. सदर मयताच्या वारसास तातडीची मदत म्हणून रक्कम रु. 100000/- धनादेश क्र. 677291 दि. 13.05.2017 अन्वये अदा केली.
30	2017	15.05.2017	रितेश मोहन वळवी, वय 3 वर्षे	खडकपाडा, गोरेगांव	बिबट्याच्या हल्ल्यात गंभीर जखमी. रक्कम रु. 100000/- धनादेश क्र. 677292 दि. 29.05.2017 अन्वये अदा केली.
31	2017	27.05.2017	धुरंजय राकेश पटेल, वय 4 वर्षे	रॉयलपाम, गोरेगांव	बिबट्याच्या हल्ल्यात किरकोळ जखमी.
32	2017	22.07.2017 रोजी सायंकाळी 05.30	विहान निलेश गुरोडा, वय अडीच वर्षे	चित्रनगरी, गोरेगांव	बिबट्याच्या हल्ल्यात मृत. सदर मयताच्या वारसांस तातडीची मदत म्हणून रु. 100000/- चा धनादेश क्र. 745712 दि. 24.07.2017 व उर्वरीत रु. 700000/- धनादेश क्र. 752620 दि. 19.08.2017 अन्वये अदा केली.
33	2017	दि. 30.09.2017	श्रीमती बाईजी बेंद्रे	रा. चाफ्याचा पाडा, युनिट क्र. 17, आरे कॉलनी, गोरेगांव	किरकोळ जखमी.
34			श्रीमती आशा गावित		किरकोळ जखमी.
35	2018	13.01.2018	श्रीमती क्रिश्नम्मा हनुमंता पल्ले	नानेपाडा, मुलूंड	गंभीर जखमी
36			श्री. बालाजी दशरथ कामोठे	नानेपाडा, मुलूंड	गंभीर जखमी
37			श्री. सुरेश रुक्माजी बासुदकर	नानेपाडा, मुलूंड	किरकोळ जखमी
38			श्रीमती सविता धनंजय खुटे	नानेपाडा, मुलूंड	किरकोळ जखमी
39			श्री. गणेश आनंद पुजारी	नानेपाडा, मुलूंड	किरकोळ जखमी
40			श्रीमती सुनिता नितीन सोनावणे	नानेपाडा, मुलूंड	किरकोळ जखमी
41	2021	30.08.2021	श्रीमती लक्ष्मी लक्ष्मण उंबरसांडे	मालीनगर 31 नंबर युनिट 9.30 वाजता.	किरकोळ जखमी
42		02.09.2021	श्री.पिंटू पांडे / यादव	युनिट 32 नंबर	किरकोळ जखमी
43		18.09.2021	रोहित टिलक बहादूर	युनिट 31 नंबर 7.30 वाजता	किरकोळ जखमी
44		26.09.2021	आयुष अरुण यादव	युनिट नं.3 8.30 वाजता	गंभीर जखमी
45		29.09.2021	श्रीमती निर्मलादेवी रामबदन सिंह	आरे सेंट्रल डेअरी जवळ, आरे वसाहत	गंभीर जखमी
46		३०.०९.२०२१	श्री. राजेश रावत	युनिट नं. 07	गंभीर जखमी
47		०८.१०.२०२१	श्री. दर्शन सतिशकुमार आदिद्रविड	युनिट नं. 13	गंभीर जखमी
48		२४.१०.२०२१	बळवंत यादव	युनिट नं.31	गंभीर जखमी
49	2022	22.10.2022	इतिका अखिलेश लोट	युनिट नं.15	मृत. सदर मयताच्या वारसास तातडीची मदत म्हणून रक्कम रु. 100000/- धनादेश क्र. 740996 दि. 29.10.2022 अन्वये अदा केली.
50					
51					
52					
53					

10.9.2 List for Human Animal Conflict in MBMC



10.9.3 List of Human Animal Conflict within BMC, MBMC and TMC as per KML

S.no.	Name	Type	Indicators	Sr. No BMC[15]	Lat_DMS	long_DMS
	BMC					
1	New Zealand Hostel Bus Stop	Leopard	Fatalities	14	19°9′7.386	72°52′18.0
2	Shankar Tekdi,Shastri Nagar,Mulund	Leopard	Fatalities	15	19°10′21.8	72°55′56.7
3	Maroshipada,Aarey milk colony	Leopard	Fatalities	16, 19	19°8′53.64	72°53′37.8
4	Khambya pada,Unit No.25,Aarey Colony,Goregaon	Leopard	Fatalities	20	19°8'42.22	72°53'7.56
5	Adarsh Nagar,Aarey Milk,Goregaon	Leopard	Fatalities	21	19°9′2.923	72°52′55.4
6	Khadakpada, Aarey Colony,Goregaon	Leopard	Fatalities	22	19°8′25.48	72°52′51.1
7	Unit No.13, Goregaon	Leopard	Fatalities	24	19°9′22.16	72°51′56.6
8	Opp.Muthu Muriyamman Temple_Unit 13	Leopard	Injuries	29, 47	19°9′28.70	72°52′8.41
9	Royal palms,Goregaon	Leopard	Fatalities	31	19°9′12.96	72°53′8.97
10	Chitranagari,Goregaon	Leopard	Fatalities	32	19°9′39.14	72°53′16.0
11	Unit no.17, chafyacha pada,Goregaon	Leopard	Fatalities	33, 34	19°8′34.15	72°52′3.74
12	Malinagar,31 no. Unit	Leopard	Fatalities	41	19°9′48.32	72°52′38.7
13	Unit no.32	Leopard	Fatalities	42	19°9′50.61	72°52′12.3
14	Unit.No.31	Leopard	Injuries	43, 48	19°9′46.61	72°52′33.6
15	Unit.No.3	Leopard	Injuries	44	19°9′34.43	72°52′5.35
16	Near Aarey Central Diary	Leopard	Fatalities	45	19°9′15.97	72°52′44.2
17	Unit No.7	Leopard	Fatalities	46	19°9′33.51	72°52′55.7
18	Unit No.15	Leopard	Fatalities	49	19°8′45.76	72°52′16.9
	MBMC					
19	Chene	Leopard			19°16′56.1	72°55′25.1
20	Chena	Leopard			19°16′43.1	72°55′40.8
21	Near Wood Stock_Chena	Leopard			19°16′30.6	72°55′29.9
22	Chena	Leopard			19°16′8.69	72°54′55.0
23	Chena	Leopard			19°16′24.5	72°55′3.47

[15] This column shows serial number from the list provided in Annexure 10.10.1

24	Near Ghodbundur rd	Leopard			19°16′43.7	72°55′20.0
25	Near Young Scholars preschool	Leopard			19°16′48.7	72°55′22.3
26	Chena	Leopard			19°16′12.1	72°55′16.5
27	Chena	Leopard			19°16′33.2	72°55′3.50
28	Near Golden Retreat villa	Leopard			19°16′32.3	72°55′23.2
29	Near Vardan Lok Ashram	Leopard			19°16′37.1	72°55′34.0
30	Near chena village	Leopard			19°16′28.2	72°55′3.27
31	Retibandar	Leopard			19°17′31.5	72°53′31.4
32	Chisbadevi mandir	Leopard			19°17′11.2	72°53′26.0
33	Near Piyushpani jain temple	Leopard			19°17′2.58	72°53′53.0
34	Versova near hotel sea and rock	Leopard			19°16′46.1	72°54′4.17
35	Survey No.34 C Versave	Leopard			19°16′37.9	72°54′16.9
36	Near Round forst office Ghodbandar	Leopard			19°16′58.7	72°53′23.1
37	S.No.34C_near ghodbandar road	Leopard			19°16′50.5	72°54′31.0
38	Dachkulpada_Ghodbandar	Leopard			19°16′27.6	72°53′49.1
39	Machyachapada_Kashi village	Leopard			19°16′2.37	72°53′54.0
40	Machyachapada_Kashi village	Leopard			19°16′1.15	72°53′51.3
41	Mandhvipada	Leopard			19°15′45.8	72°53′23.0
42	Kashi village	Leopard			19°15′56.6	72°53′48.2
43	Behind Round Forest Office	Leopard			19°16′58.6	72°53′31.2
44	Maharaj Nursery Kashimira road	Leopard			19°16′58.1	72°53′31.2
	TMC					
45	Suraj Water Park	Leopard			19°15′16.5	72°58′14.2
46	Manpada Nilkant	Leopard			19°14′37.9	72°58′18.4
47	Uniabex	Leopard			19°14′30.1	72°58′26.8
48	Lokmanya Nagar	Leopard			19°12′43.8	72°56′48.9
49	Ayyappa Mandir	Leopard			19°11′28.0	72°56′32.2
50	Ram Nagar	Crocodile			19°11′49.4	72°56′35.0
51	Cosmos	Leopard			19°16′22.9	72°57′1.56

52	Owala	Croco dile			19°16′ 30.8	72°57′0. 30
53	Patvanapada	Leopa rd			19°14′ 29.5	72°56′3 2.2
54	Patonepada Bus stop	Leopa rd			19°14′ 24.0	72°56′3 8.9
55	Ronachapada	Leopa rd			19°14′ 18.9	72°56′3 9.6
56	Narlepada	Leopa rd			19°14′ 16.4	72°57′1. 31
57	Bhendipada	Leopa rd			19°14′ 6.99	72°57′3. 17
58	Near Rocksport	Leopa rd			19°14′ 10.7	72°56′2 0.7
59	Near Bienvenue retreat	Leopa rd			19°14′ 1.83	72°56′2 4.7
60	Bhendipada	Leopa rd			19°13′ 48.2	72°56′5 3.9
61	Near Khadani, Yeoor Lake	Leopa rd			19°13′ 25.8	72°56′5 4.6
62	Patilpada_	Leopa rd			19°13′ 20.6	72°56′5 4.6
63	Near Golden Swan Country Club	Leopa rd			19°13′ 40.5	72°56′4 3.3

AMIT KUMAR RAJHANS

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DN: c=IN, o=PERSONAL, title=5900, 2.5.4.20=d3a7d2c82a21805d3a23ff9455618b02a4090e4548da0d3cde36803d75916f3e, postalCode=400606, st=Maharashtra, serialNumber=65ecd3d5891e3a53da00f15553ec8b1508b649464e3dcf09921cccb672dd17a0, cn=ANOOP HEMANT APTE
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