

Development Plan Report-2012

For Manori Gorai Uttan Notified Area



Maharashtra Regional and Town Planning Act, 1966.

Sanction to Development plan of villages Manori & Gorai (Municipal Corporation of Greater Mumbai) and Uttan, Pali, Chowk, Tarodi, Dongri & Morva (Mira Bhayander Municipal Corporation) under Section 31(1) of the Act.

GOVERNMENT OF MAHARASHTRA

Urban Development Department

Mantralaya, Mumbai-400032.

Date :- 13th May, 2013.

NOTIFICATION

No.TPB-4312/323/CR-23/2013/AID-11.

Whereas, the Government in Urban Development Department vide Notification No. TPB 4307/108/CR-29/07/UD-11, dated 1st December, 2007 under section 40(1) of the Maharashtra Regional and Town Planning Act,1966 (Mah. XXXVII of 1966) (hereinafter referred to as "the said Act") has appointed Mumbai Metropolitan Region Development Authority (hereinafter referred to by its acronym "MMRDA"), established under the Mumbai Metropolitan Region Development Authority Act, 1974 (Mah. IV of 1975), to be the Special Planning Authority for the Development of Recreation & Tourism Development Zone as per proposal of sanctioned Revised Regional Plan for Mumbai Metropolitan Regional Plan, on the lands of villages Manori & Gorai (Municipal Corporation of Greater Mumbai) and Uttan, Pali, Chowk, Tarodi, Dongri & Morva (Mira Bhayander Municipal Corporation) (hereinafter referred to as "the said Notified Area");

And whereas, the MMRDA declared its intention under section 23 of the said Act to prepare a fresh Development Plan for the said Notified Area and a notice of such declaration was published in the Maharashtra Government Official Gazette, Miscellaneous Part-II dated 25th October, 2010;

And whereas, the MMRDA after carrying out survey of the entire land of the said Notified Area, as required under section 25 of the said Act, prepared the Draft Development Plan of the said Notified Area along with Development Control Regulations and published a notice under sub-section (1) of Section 26 of the said Act in the Maharashtra Government Gazette, Extra-Ordinary Part-II, dated 15th November 2011 for inviting objections or suggestions from the general public;

And whereas, after considering the suggestions and objections received in respect of the aforesaid published Draft Development Plan, the Planning Committee set up under section 28(2) submitted its report to the MMRDA and whereas the MMRDA made certain modifications in the Draft Development Plan (hereinafter referred to as "the said Development Plan") under sub-Section (4) of Section 28 of the said Act and decided to submit the said Development Plan to the Government for sanction under Section 30 of the said Act;

And whereas, MMRDA before submitting the said Development Plan to the Government under Section 30 of the said Act, published the said Development Plan so modified for

information of the general public under sub Section (4) of Section 28 by a notice published in Maharashtra Government Official Gazette, Miscellaneous, Part – II, dated 2nd May 2012;

And whereas, in accordance with provisions of section 30 of the said Act, the MMRDA has submitted the said Development Plan along with the Development Control Regulations to the State Govt. for sanction on 14th May 2012;

And whereas, in accordance with sub-section (1) of Section 31 of the said Act, after making necessary enquiries and after consulting the Director of Town Planning, Maharashtra State, the State Government has decided to sanction a part of the said Development Plan with modifications as specified in **SCHEDULE –A**, excluding the substantial modifications as specified in **SCHEDULE-B** (as **EP-1 to EP-56**) of this Notification;

Now therefore, in exercise of the powers conferred by sub-section (1) of Section 31 of the said Act and of all other powers enabling it on that behalf, the Government of Maharashtra hereby:-

- a) Sanctions the said Development Plan, along with a Schedule of Modifications namely **SCHEDULE-A** appended hereto, excluding the proposals involving substantial modifications as specified in **SCHEDULE-B** appended hereto.
- b) Fixes the date after one month from the date of this Notification in the Official Gazette to be the date on which Final Development Plan shall come into force.

The reservations/allocations/designations which do not appear in the **SCHEDULE A & B** are hereby sanctioned for respective purpose as designated in the Final Development Plan.

Areas of reserved sites mentioned in the report of the Final Development Plan are approximate and subject to actual measurement on site as per boundaries shown on the Final Development Plan.

Draftsman's errors which are required to be corrected as per actual situation on site or as per survey records, sanctioned layout, etc, shall be corrected by the Metropolitan Commissioner, MMRDA after due verification and with prior approval of the Director of Town Planning, Maharashtra State, Pune.

The aforesaid Final Development Plan sanctioned by the State Government shall be kept open for inspection by the public during office hours on all working days for a period of one month from the date of coming into force of this Notification, in the office of the

- 1) Metropolitan Commissioner, Mumbai Metropolitan Region Development Authority, Bandra-Kurla Complex, Bandra (E), Mumbai-51.
- 2) Commissioner, Municipal Corporation of Gr. Mumbai.
- 3) Commissioner, Mira-Bhayandar Municipal Corporation.

This Notification shall also be made available on the Govt. website-
www.maharashtra.gov.in

By order and in the name of Governor of Maharashtra,



(Sanjay Banait)
Under Secretary to Government.

**Maharashtra Regional and
Town Planning Act, 1966**

**Notice under Section 31(1) for
substantial modification to the
Development Plan for villages Manori
& Gorai (Municipal Corporation of
Greater Mumbai) and Uttan, Pali,
Chowk, Tarodi, Dongri & Morva
(Mira Bhayander Municipal
Corporation)**

**GOVERNMENT OF MAHARASHTRA
Urban Development Department
Mantralaya, Mumbai 400032.
Date :- 13th May, 2013.**

NOTICE

No. TPB-4312/323/CR-23/2013/UD-11.

Whereas, the Government in Urban Development Department vide Notification 1PD 4307/108/CR-29/07/UD-11, dated 1st December, 2007 under section 40(1)(c) of the Maharashtra Regional and Town Planning Act, 1966 (Mah. XXXVII of 1966) (hereinafter referred to as "the said Act"), has appointed Mumbai Metropolitan Region Development Authority (hereinafter referred to by its acronym "MMRDA"), established under the Mumbai Metropolitan Region Development Authority Act, 1974 (Mah. IV of 1975), to be the Special Planning Authority for the Development of Recreation & Tourism Development Zone as per proposal of Sanctioned Revised Regional Plan for Mumbai Metropolitan Regional Plan, on the lands of villages Manori & Gorai (Municipal Corporation of Greater Mumbai) and Uttan, Pali, Chowk, Tarodi, Dongri & Morva (Mira Bhayander Municipal Corporation) (hereinafter referred to as "the said Notified Area");

And whereas, the MMRDA declared its intention under section 25 of the said Act to prepare a fresh Development Plan for the said Notified Area and a notice of such declaration was published in the Maharashtra Government Official Gazette, Miscellaneous Part-II dated 25th October, 2010;

And whereas, the MMRDA after carrying out survey of the entire land of the said Notified Area, as required under section 25 of the said Act, prepared the Draft Development Plan of the said Notified Area along with Development Control Regulations, and published a notice under sub-section (1) of Section 26 of the said Act in the Maharashtra Government Gazette, Extra-Ordinary Part-II, dated 15th November 2011 for inviting objections or suggestions from the general public;

And whereas, after considering the suggestions and objections received in respect of the aforesaid published Draft Development Plan, the Planning Committee set up under section 28(2) submitted its report to the MMRDA and whereas the MMRDA made certain modifications in the Draft Development Plan (hereinafter referred to as "the said Development Plan") under sub-Section (4) of Section 28 of the said Act and decided to submit the said Development Plan to the Government for sanction under Section 30 of the said Act;

And whereas, MMRDA before submitting the said Development Plan to the Government under Section 30 of the said Act, published the said Development Plan so modified for

information of the general public under sub Section (4) of Section 28 by a notice published in Maharashtra Government official Gazette, Miscellaneous, Part – II, dated 2nd May 2012;

And whereas, in accordance with provisions of section 30 of the said Act, the MMRDA has submitted the said Development Plan alongwith the Development Control Regulations to the State Govt. for sanction on 14th May 2012;

And whereas, in accordance with sub-section (1) of Section 31 of the said Act, after making necessary enquiries and after consulting the Director of Town Planning, Maharashtra State, the State Government has vide Notification No. TPB-4312/323/CR-23/2013/TD-11, dated 13th May 2013 sanctioned a part of the said Development Plan with modifications excluding, the substantial modifications as specified in **SCHEDULE-X** (as F.P-1 to EP-56);

Now therefore, in exercise of the powers conferred by sub-section (1) of Section 31 of the said Act and of all other powers enabling it on that behalf, the Government of Maharashtra hereby:-

- a) Gives notice for inviting suggestions and objections from any person in respect of the proposed modifications of substantial nature as specified in the **SCHEDULE-X** appended hereto, within a period of 30 days from the date of publication of this notice in the Official Gazette.
- b) Appoints the Deputy Director of Town Planning, Greater Mumbai as the "Officer" under Section 31(2) of the said Act, to hear all the persons filing suggestions and objections as stated in (a) above within the stipulated period and to submit his report thereupon to the Government for further necessary action.

Only the suggestions or objections regarding the proposed modifications of substantial nature mentioned in **SCHEDULE-X** that may be received by the Deputy Director of Town Planning, Greater Mumbai, having his office at ENSA Hutments, E-Block, Azad Maidan, Mahapalika Marg, Mumbai 400 001, within the stipulated period of 30 days from the date of publication of this notice in the Official Gazette, shall be considered.

Copy of the said notice along with **SCHEDULE-X** and the plan showing the proposed modifications of substantial nature shall be made available for inspection to the general public at the following offices during office hours on all working days:

- 1) Metropolitan Commissioner, Mumbai Metropolitan Region Development Authority, Bandra-Kurla Complex, Bandra(E), Mumbai - 400 051.
- 2) Commissioner, Municipal Corporation of Gr. Mumbai.
- 3) Commissioner, Mira-Bhayaadar Municipal Corporation.
- 4) Deputy Director of Town Planning, Greater Mumbai, ENSA Hutments, E-Block, Azad Maidan, Mahapalika Marg, Mumbai - 400 001.

This Notice shall also be made available on the Govt. website- www.maharashtra.gov.in

By order and in the name of Governor of Maharashtra,

(Sunjay Banait)

Under Secretary to Government

Draft Development Plan for Manori-Gorai-Uttan Notified Area

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Abbreviations Used

ANCGR	Annual Compounded Growth Rate
BUA	Built Up Area
CESS	Centre for Earth Science Studies
CPCB	Central Pollution Control Board
CRZ	Coastal Regulation Zone
CTS No.	City Survey Number
CZMP	Coastal Zone Management Plan
DC	Development Charges
DCR	Development Control Regulations
DP	Development Plan
ELU	Existing Land Use
FRP	Fiber Reinforced Plastic
Govt.	Government
Ha	Hectare
HH	Household
HP	Horse Power
Kmph	Kilometer per hour
LU Plan	Land Use Plan
MBMC	Mira Bhayander Municipal Corporation
MC	Municipal Corporation
MCGM	Municipal Corporation of Greater Mumbai
MGU	Manori Gorai Uttan
MMB	Maharashtra Maritime Board
MMR	Mumbai Metropolitan Region
MMRDA	Mumbai Metropolitan Region Development Authority
MMR HCS	Mumbai Metropolitan Region Heritage Conservation Society
MR & TP Act	Maharashtra Regional and Town Planning Act, 1966
MSRTC	Maharashtra State Road Transport Corporation
MTDC	Maharashtra Tourism Development Corporation
NA	MGU Notified Area
NDZ	No Development Zone
NGO	Non-Governmental Organization
RTDZ	Recreation and Tourism Development Zone
S. No	Survey Number
SOI	Survey of India
SPA	Special Planning Authority
Sq.km	Square Kilometer
Sq.m	Square Meter
SW	Solid Waste
TCPO	Town and Country Planning Organization
TPVD	Town Planning and Valuation Department
WB	Water Body
WFR	Work Force Participation Rate

I. Preamble

I.1 Potential of MGU Notified Area as RTDZ

Located on the western coast of Maharashtra, Mumbai, originally an archipelago of seven islands is now the capital of Maharashtra and the most populous city of India with a population of about 12.5 million (2011). Greater Mumbai Urban Agglomeration is the world's 4th most populous metropolitan area. On account of the intense development and demand for land in Mumbai, there are few areas in the periphery of the agglomeration that provide a much needed getaway for the residents of Mumbai such as the Sanjay Gandhi National Park and the beaches of Manori, Gorai & Uttan (Map No 1).

Manori-Gorai-Uttan area (MGU) is a picturesque and ecologically rich region with large areas under mangroves, ridges with natural vegetation, beaches, rocky outcrops and geological rock formations. The MGU peninsula juts into the Arabian Sea and is located on the western part of the intensely developed city of Mumbai. By virtue of being close to the city of Mumbai and Mira Bhayander, Manori-Gorai-Uttan area has turned into a recreational getaway that attracts local tourists especially during the weekends, festive seasons and vacation periods. Many one day visitors come into the area to visit the beaches, Essel World and the Global Pagoda (Map No 2).

Given the natural setting and location, the area has potential to be developed as a tourist place. The sanctioned Regional Plan, 1996-2011 for Mumbai Metropolitan Region recognized this tourism potential and designated this area as Recreation & Tourism Development Zone (RTDZ).

I.2 Need for a New Plan – Changing Context

Mumbai has grown at a burgeoning pace and in the process has lost its open spaces to intense development. Albeit there are few pockets of large urban greens that are still intact such as the Sanjay Gandhi National Park, Aarey Milk Colony, Race Course and the MGU Notified Area. However, these too are increasingly facing the pressures of development. It is crucial to look at some of these spaces as large recreational areas and green zones at regional level and with a view to preserve and enhance them.

The spending capacity and mobility of the people has improved thus resulting in an increased demand for recreational and tourism related activities. The existing recreational and tourist places around Mumbai particularly the popular ones, like Matheran, are proving to be inadequate. There is a perceived need for high quality recreational areas in close proximity that offer variety of facilities and activities for all age groups and for those with varied interests.

The MGU Notified Area is just a stone's throw away from the main land and has been serving as a popular weekend getaway for the citizens of Mumbai. However, the nature of tourism is largely local as most of the facilities and infrastructure are provided by the local residents and are of a inferior quality. The only exceptions are the Essel World and the Global Pagoda that attract a large number of tourists through its modern facilities and thematic value.

The area has tremendous potential for development as a high quality tourism node catering to different income groups providing a range of recreational activities as it is endowed with several features of interest ranging from beaches, geological formations, heritage structures and natural beauty. The MGU Notified Area also can prospectively catalyze Mumbai's role as the center of business/finance activities and media and entertainment industry by providing necessary supporting infrastructure.

The MGU RTDZ Notified Area has an extremely rich and fragile ecology. The area by far has largely remained in a pristine condition owing to the limited connectivity with mainland Mumbai. The MMR Regional Plan and Development Plans of Mumbai and Mira Bhayander Municipal Corporations have also contributed in conserving the natural environs. It is therefore crucial for any future planning effort to be sensitive towards the ecology and for the development to be responsive to the surroundings.

Development Plan for MGU Notified Area

The Mumbai Metropolitan Region Development Authority (MMRDA) was appointed as Special Planning Authority (SPA) under Section 40 of the Maharashtra Regional and Town Planning Act 1966 on 24 August 2004 for the development of the proposed RTDZ.

1.3 Preparation of Development Plan for MGU Notified Area

MMRDA declared its intention to prepare the Development Plan for the notified area vide notification PD/GMU/RTDP/1230/2006 dated 4th December, 2006.

However, the Government appointed Maharashtra Tourism Corporation (MTDC) as SPA vide notification no. TPB 4307/108/CR-29/07/UD-II dated 9th April, 2007. Thereafter, the Government reappointed MMRDA as the SPA vide notification no. 4307/108/CR-29/07/UD-II dated 1st December, 2007. In the same notification survey no. 34I of Uttan was excluded from the SPA in view of the Revenue Department's resolution no. Land/2707/CR-162/J-4 dated 21 November 2007.

The plan period of the Development Plan is considered from 2011 to 2022. Development Plans are generally prepared for a period of twenty years. The earlier Development Plans prepared by MCGM and MBMC proposed very little or no interventions in the ecologically sensitive Planning Area.

Keeping in mind the sensitive nature of the area and the fact that demarcation of the high tide line and preparation of the new CZMPs will happen shortly, it was deemed fit to prepare the DP for a period of 10 years i.e., upto 2022 and revise the same after reviewing the impacts of the interventions as proposed in the new DP.

1.4 Institutional Framework for Planning and Managing Development

The MGU Notified Area comprises of 8 villages in all, of which Manori and Gorai with an area of about 19.52 sq km fall under the administrative jurisdiction of Municipal Corporation of Greater Mumbai (MCGM) and Chowk, Dongri, Pali, Tarodi, Morva and Uttan with an area of about 23.61 sq km fall under the jurisdiction of Mira Bhayander Municipal Corporation (MBMC). The jurisdictional details of the planning agencies in the MGU notified area are as given below:

A Municipal Corporation of Greater Mumbai (MCGM) (Map No. 3)

MCGM was established in 1873 and the suburbs were included in the corporation in 1950. MCGM is governed by the Mumbai Municipal Corporation (MMC) Act 1888, which defines the various roles, responsibilities and duties of the Corporation and the MR&TP Act, 1966 for development planning. MCGM is organized into following administrative divisions:

Table No. 1.1: Administrative Divisions of MCGM

Sl. No.	Unit	Ward	Administrative Wing
1	Island Gty	Ward A	Zone 1
		Ward B	Zone 1
		Ward C	Zone 1
		Ward D	Zone 1
		Ward E	Zone 1
		Ward F	Zone 2
		Ward G	Zone 2

Source: MCGM Website

Sl. No.	Unit	Ward	Administrative Wing
2	Western Suburbs	Ward H	Zone 3
		Ward K	Zone 3
		Ward P	Zone 4
		Ward R	Zone 4
		Ward L	Zone 5
3	Eastern Suburbs	Ward M	Zone 5
		Ward N	Zone 6
		Ward S	Zone 6
		Ward T	Zone 6

The villages of Gorai and Manori which are included in the MGU Notified Area are part of the Western Suburbs. Manori is part of P – North ward and Gorai is part of R – Central ward. The wards are further sub divided into sections for Census enumeration. Manori is listed as section 66 in P ward and Gorai as section 71 in R ward. Development in the villages of Gorai and Manori falling under MCGM's jurisdiction is controlled and guided by the Development Plan and Development Control Regulations (DCRs) of MCGM.

B Mira Bhayander Municipal Corporation (MBMC) (Map No. 4)

The Mira Bhayander Municipal Council was constituted on 12th June 1985 under the **Maharashtra Municipal Act 1965**. At the time of its constitution, MBMC comprised of 9 villages of Khari, Ghoddeo, Ghodbunder, Pen-Pada, Mira, Kashi, Navaghar, Bhayander and Mahajanwadi. The entire area of the Municipal Council limits was 32 sq km. Later in 1990 the limits were extended by including 10 more villages – Chene, Varsave, Rai Murdhe, Murdhe, Morva, Uttan, Dongri, Tarodi, Pali and Chowk having an area of 47.40 sq km thus increasing the area to 79.40 sq km. Later on 28th February, 2002 Mira Bhayander Municipal Council was declared as Municipal Corporation. MBMC has 47 census wards and 28 electoral wards. The villages of Uttan, Pali, Chowk, Tarodi, Dongri and Morva fall under the following census wards:

Table No. 1.2: Census Wards of MBMC

Sl. No.	Villages	Census Ward No.
1	Uttan	26, 27, 28
2	Pali	1
3	Chowk	1
4	Tarodi	2
5	Dongri	2
6	Morva	3, 25

Development in the 6 villages of Uttan, Pali, Chowk, Tarodi, Dongri and Morva falling under MBMC's jurisdiction is controlled and guided by the Development Plan and DCRs of MBMC.

C Mumbai Metropolitan Region Development Authority (MMRDA)

MMRDA was established on 26th January 1975 under the Mumbai Metropolitan Region Development Authority Act, 1974. The MMR consists of 8 Municipal Corporations, 9 Municipal Councils and nearly 1000 villages.

As per the MR&TP Act, 1966 it is the Municipal Corporation or a Municipal Council, which functions as the Planning Authority. However, the Act also enables the creation of Special Planning Authorities under Section 40 to plan and regulate development for special areas / undeveloped areas. It is under this provision that MMRDA has been appointed as a Special Planning Authority (SPA) for the notified area in August 2004 and in 2007.

1.5 The Planning Area and Key Statistics

The total area of the MGU Notified Area as measured on satellite image is 43.13 sq km. The area of the notified area as per the Revenue Land Records works out to be 44.49 Ha. The additional area along the coast comprising of the beach, rocky outcrops and mangroves is termed as 'additional extent', and works out to be 2.22 sq km. Although this is excluded from the MGU Notified Area for calculation purposes, planning interventions in this area are proposed.

The MGU Notified Area consists of 8 villages: Manori-Culvem, Gorai, Uttan, Pali, Chowk, Tarodi, Dongri and Morva. This designated planning area falls under two different jurisdictions. Map No. 5 shows the various spatial units and Table No. 1.3 gives the area and population details:

Table No. 1.3: Village-wise Area and Population Distribution in MGU Notified Area

S. No.	Name of Village	Jurisdiction	Area (Ha)	Population (2001)	Density of popln. (persons/Ha)
1	Manori - Culvem	MCGM	741	4603	6.2
2	Gorai	MCGM	1211	4949	4.1
3	Uttan	MBMC	1490	15748	10.6
4	Pali	MBMC	99	2751	27.8
5	Chowk	MBMC	190	2751	14.5
6	Tarodi	MBMC	122	1511	12.4
7	Dongri	MBMC	291	3526	12.1
8	Morva	MBMC	169	2080	12.3
	Total		4313	37919	8.8

2 Introduction

2.1 Location and Topography

The MGU Notified Area lies between 19°31' N to 19°18' N Latitudes and 72°76' E to 72°84' E Longitudes.

The MGU Notified Area is a triangular landmass jutting into the Arabian Sea on the western side. Vasai creek in the north and Manori creek in east separate the peninsula from the main landmass. MGU Notified Area is connected to the mainland on the north east side. The total north south length of the peninsula is 12.9 km, the minimum width is about 0.48 km at Manori jetty and the maximum width is about 5.8 km in the center at Uttan.

Northern tip of MGU Notified Area near Chowk is characterized by basaltic hillocks, which slope gently towards south. There are 3 ridges – Chowk ridge, Dongri ridge and Gorai ridge which trend in the north-south direction. These ridges are separated by flat land. There are a few hillocks in Uttan and Gorai as well. The southern stretch of the peninsula is flatter and has a large expanse of mangroves and mudflats along the Manori creek (Map No. 6).

2.2 Climate

Being in the tropical zone and near the Arabian Sea, the climate of MGU Notified Area is tropical wet and dry. The climate can be best described as moderate temperatures with high level of humidity. Coastal and tropical location ensures moderate temperatures throughout the year with an average precipitation of 2422 cm (95.35 inches). The average temperature in summer is about 30°C and about 18°C in winter.

The prevailing direction of the normal seasonal wind during the year is west and north-west. The mean wind direction in December oscillates between west, north-west to east, north east and in June, south west is the dominant wind direction. Generally, the winds are light and variable at about 8 kmph. During the wet season, however, the velocity gradually increases, reaching the peak value of about 13 kmph.

2.3 Connectivity by Road and Water

2.3.1 Road Linkages

The MGU Notified Area is accessed via Kashimira Bhayander Road from Mira Bhayander. There is only one main road, which runs from north to south providing connectivity to various settlements in the MGU Notified Area. The main road has three important junctions/nodes namely:

- A. Dongri settlement: The road from Mira Bhayander via Morva bifurcates at Dongri settlement.
 - The road towards north leads to Tarodi settlement and culminates at the jetty in Chowk.
 - The road towards the south leads to Gorai and Manori – Culvem, this is the main road/spine of the MGU Notified Area.
- B. Uttan Police Post near Bhut Bungalow: The road here bifurcates in two directions from the main road/spine road.
 - The road towards west leads to Uttan and further traverses to the north connecting Pali and Chowk.
 - The road towards south east from the main road/spine leads to Keshav Shristi Ayurvedic Research Center.

C. Gorai Cross near Rickshaw Stand: The road here bifurcates in two directions from the main road/spine road

- The road towards east leads to Gorai jetty and Essel World.
- The road towards west from the main road/spine leads to the Gorai settlement.
- The main road further leads down south and culminates at Manori jetty.

2.3.2 Water Linkages

Water transport is another important mode of transportation that connects the MGU Notified Area with the mainland. There are 9 jetties in the Notified Area (Map No. 14). Some are exclusively used for fishing activities and the others for transportation.

The jetties in the MGU Notified Area fall under the Bandra Group of Ports managed by the Maharashtra Maritime Board (MMB). There are 2 jetties one at Gorai and other at Manori where the ferry services operate. Nearly 3500 persons commute from Manori jetty and 1500 from Gorai jetty. The remaining 7 jetties (1 at Manori, 2 at Gorai, 3 at Uttan and 1 each at Pali and Chowk) are used for fishing activities. Essel World has built 1 separate jetty near Essel World (Gorai) for captive and general use. Essel World uses nine private ferries for captive requirement.

2.4 Population and Demography

2.4.1 Population

Total population in MGU Notified Area is about 37,919 as per 2001 census. The MGU Notified Area has demonstrated a steady growth rate of about 22.5% during 1961-71 and 1971-81 which significantly increased to about 33% during 1981-91 and 1991-2001.

Table No. 2.1: CAGR of Population at Village level for MGU Notified Area (1981-2001)

Sl. No.	Name of Village	Population			CAGR	
		1981	1991	2001	1981-91	1991-01
1	Manori - Culvem	3,686	4,079	4,603	1.02	1.22
2	Gorai	2,537	3,928	4,949	4.47	2.34
3	Uttan	7,254	10,688	15,748	3.95	3.95
4	Pali	2,189	2,454	2,751	1.15	1.15
5	Chowk	1,239	1,846	2,751	4.07	4.07
6	Tarodi	434	810	1,511	6.44	6.43
7	Dongri	901	1,782	3,526	7.06	7.06
8	Morva	1,398	1,705	2,080	2.01	2.01
	Total	19,638	27,292	37,919	3.35	3.34

Source: Census 1981, 1991 and 2001

The growth trend during the last two decades is comparable to that of the Western Suburbs and is much higher than Greater Mumbai indicating that the notified area is expected to witness higher growth in the future. Although a large part of the MGU Notified Area is a part of Mira Bhayander which is witnessing a very rapid growth, it is quite distinct and has not been affected by the recent rapid growth spurt witnessed by Mira Bhayander.

2.4.2 Densities

The overall gross population density in the planning area as per census 2001 was 8.8 persons/ha (refer Table no. 1.3) as against 248 persons/ha in the Western Suburbs, 267 persons/ha in Greater Mumbai and 66 persons/ha in Mira Bhayander. The exceptionally low density is on account of the fact that the planning area is disconnected from the main land and a major portion is under no development zone comprising of mangroves and hills.

2.4.3 Workforce Participation Rate

The total work force participation rate (WPR calculated as Working Population of Main & Marginal Workers ×100/ Total Population) for MGU as per census 2001 was 42% which is higher than that of 38% in MCGM and 37% in MBMC. There has been a 3% increase in the work force participation rate over the past two decades. Higher rates are observed in the fishing villages namely Gorai, Pali and Chowk in both the years 1991 and 2001 (refer Table no. 2.2).

2.4.4 Occupational Structure

Of the total number of main workers, 43.2% are engaged in primary sector, 5.55% are engaged in secondary sector and 90.12% are in tertiary sector as per census, 2001 (refer Table no. 2.2).

2.4.5 Literacy Rate

The literacy rate as per census 2001 was 66%, which is slightly lower than the western suburbs (68%) and significantly lower than MCGM (76%) and MBMC (77%). The male literacy rate in the planning area is 73% as compared to the female literacy rate of 58%. Uttan has the highest literacy rate of 71% amongst all the villages (refer Table no. 2.2).

2.4.6 Sex Ratio

The MGU notified area exhibits a sex ratio of 916 females per 1,000 males (as per census 2001) which is more balanced as compared to that of the Western suburbs (826/1,000), MCGM (809/1,000) and MBMC (817/1,000). This is indicative of low migration in the area (Table below).

Table No. 22: WFPR, Occupational Pattern, Literacy & Sex Ratio at Village level for MGU Notified Area (2001)

N o.	Village	WFPR 2001-%	Occupational Pattern %			Literacy %	Sex ratio (per 1000 males)
			Primary Workers	Secondary Workers	Tertiary Workers		
1	Manori-Culvem	42.95	5.49	10.24	84.27	59.92	969
2	Gorai	45.08	16.48	6.47	77.05	59.89	893
3	Uttan	41.80	1.63	2.86	95.52	70.92	897
4	Pali	45.07	0.62	12.38	87.00	60.52	999
5	Chowk	45.07	0.62	12.38	87.00	60.52	999
6	Tarodi	38.52	3.48	1.64	94.89	67.17	902
7	Dongri	38.51	3.50	1.75	94.75	67.19	902
8	Morva	37.21	2.10	1.26	96.50	66.49	824
	NA Total	42.16	4.32	5.55	90.12	65.90	916
9	W. suburbs	37.56	0.16	2.27	92.57	68.42	826
10	MCGM	37.27	0.16	2.64	97.20	76.51	809
11	MBMC	37.12	0.32	1.63	98.05	77.34	817

Source: Census 2001

2.5 Provisions under Various Statutory Plans for MGU Notified Area

This section reviews the various statutory plans for the notified area including the DPs of MCGM & MBMC and the Regional Plan for Mumbai Metropolitan Region prepared by MMRDA along with the specific provisions pertaining to the MGU Notified Area.

2.5.1 Development Plan of MCGM

The first Development Plan (DP) for Mumbai was sanctioned by the Government of Maharashtra in parts from 1965-67. Subsequently, it was revised and sanctioned in parts during 1991-94 and the DCR came into force on 25 March 1991. Development in Mumbai is currently governed by this Development Plan.

2.5.1.1 Zoning Proposals for the MGU Notified Area, MCGM DP (Map Nos. 7 & 9)

The land use proposals as per the sanctioned DP of MCGM in the MGU Notified Area are given below:

Table No. 23: Proposed Land Use of MCGM Development Plan in MGU Notified Area

S. No	Proposed Land-Use Zones in the DP	Area (Ha)	% to Total
1	Residential	30.19	1.55
2	Commercial	0.00	0.00
3	Industrial	0.00	0.00
4	Public / Institutional	0.00	0.00
5	Forest & Hill	0.00	0.00
6	NDZ / Coastal Wetland	1805.63	92.51
7	Water body	72.81	3.73
8	Road	28.34	1.45
9	Reservation	14.89	0.76
	Total	1951.86	100.00

Source: Computed by superimposing Land Use Zoning proposals from the MCGM Development Plan on the Base Map

2.5.1.2 Public Purpose Reservations for notified area as per MCGM DP

Table No. 24: Public Purpose Reservations in MCGM area of MGU Notified Area (Summary)

S. No	Reservations	Area (Ha)
1	Crematorium	0.84
2	Educational	2.91
3	Health	0.77
4	Recreational	7.31
5	Institutional	1.21
6	Transportation	1.85
	Total	14.89

Source: Computed by superimposing Land Use Zoning proposals from the MCGM Development Plan on the Base Map

2.5.1.3 Other Significant Proposals for the MGU Notified Area, MCGM DP

Following is the list of DP proposals pertaining to the MGU notified area:

- Construction of a bridge across the Manori creek from Borivali to Gorai Jetty
- Construction of a bridge across the Manori creek from Marve to Manori Jetty
- Widening /upgrading the road from Gorai Jetty to Manori Jetty
- 50 m wide green zone all along the coast and along the road from Gorai Jetty to the main Culvem – Gorai road
- Plots have been reserved for public purposes like parking lots, primary health centers, fire brigades, burial grounds, educational institutes and playgrounds

2.5.2 Development Plan of MBMC

Mira Bhayander was identified as one of the growth centers in the Regional Plan (1971-1991). An Outline Zonal Plan for Mira Bhayander was prepared by the Town Planning and Valuation Department and was sanctioned in June 1973. Mira Bhayander was at that time administered under the Gram Panchayat system. This sanctioned Zonal Plan was later revised to provide adequate land for industrial, residential areas, open spaces, town center and adequate road network under the provisions of the MR&TP Act, 1966 and was sanctioned in 1983. Subsequently,

under the recommendation of MMRDA, Mira Bhayander Municipal Council was constituted in June 1985. As a part of its obligatory function under the MR&TP Act, MBMC entrusted the task of preparing a Development Plan to Thane Town Planning Department. As stipulated in the MRTTP Act, 1966 the Draft Development Plan was published in 1992 for inviting objections / suggestions from the public. Subsequently, a Planning Committee was constituted to resolve the issues in the draft DP and submit a report on the same, but it failed. The time for completing the Development Plan formalities lapsed and eventually the State Government appointed the Deputy Director of Town Planning, Konkan Division for completing the remaining formalities. The Development Plan was submitted for approval to the State Government under Section 30 of the MR&TP Act, 1966 in 1995 and was approved in 1997. The horizon year for the approved DP is 2011.

2.5.2.1 Zoning Proposals for the MGU Notified Area, MBMC DP (Map No. 8 & 9)

Table No. 2.5: Proposed Land Use of MBMC Development Plan in MGU Notified Area

Sl. No	Proposed Land-Use Zones in DP	Area (Ha)	% to Sub Total
1	Residential	113.67	4.82
2	Commercial	0.31	0.01
3	Industrial	0	0.00
4	Public / Institutional	1.73	0.07
5	Forest & Hill	516.14	21.86
6	Coastal Wetland / NDZ	1,428.75	60.52
7	Water body	68.07	2.88
8	Road	51.4	2.18
9	Reservation	180.66	7.65
	Total	2,360.73	100.00

Source: Computed by superimposing Land Use Zoning proposals from the MBMC Development Plan on the Base Map.

- **Residential Zone:** It is further classified as R1 and R2. R1 is purely residential zone and R2 is residential zone where line of shops is permitted on all plots abutting more than 9m wide roads in Gaothan and 12m wide road in other areas.
- **No development zone:** Areas predominantly under agriculture, mangroves and hills are classified as NDZ.
- **Public Semipublic Zone:** This zone includes all the churches, temples, mosques, schools, hospitals etc.

2.5.2.2 Public Purpose Reservations for notified area as per MBMC DP

Table No. 2.6: Public Purpose Reservations in MBMC area of MGU Notified Area (Summary)

Sl. No	Reservations	Area (Ha)
1	Fishing Related	21.83
2	Educational	6.05
3	Burial Grounds/ Crematoria	0.53
4	Health	0.83
5	Recreational	34.54
6	Commercial	0.78
7	Tourism	112.77
8	Institutional	3.33
	Total	180.66 (67.89)

Source: Computed by superimposing Land Use Zoning proposals from the MBMC Development Plan – 2011 on the Base Map

2.5.3 Regional Plan of Mumbai Metropolitan Region (MMR)

The Regional Plan, 1996-11 clearly distinguished 'development areas' from 'conservation areas' and framed appropriate development regulations for each. The development areas were further classified as U1 (areas with intensive urban development) and U2 (areas with urban development potential) Zones. The Regional Plan delineated areas with tourism potential and also demarcated areas within a radius of 500m around places of recreation and tourism interest as Recreation and Tourism Development Zone (RTDZ). The Plan delineated environmentally sensitive areas as Green Zone (G-1) with restricted development and widened the range of activities permitted therein. The MGU Notified Area is one of the nodes identified for recreation and tourism development.

The zoning proposals in the MMR plan serve as guidelines for preparation of Development Plans for various Planning Authorities (Urban Local Bodies and Special Planning Authorities) within the region. The developments outside the purview of the ULBs are governed by MMR's DC Regulations.

2.5.3.1 Zoning Proposals for the MGU Notified Area (Map No. 10)

Table No. 27: Proposed Land Use in MGU Notified Area, MMR Regional Plan, 1996-2011

No	Name of Village	Total Area (Ha)	RTDZ (Ha)	G-1 (Ha)	CW (Ha)
		1(2+3+4)	2	3	4
1	Manori	741	741	0	0
2	Gorai	1,211	1211	0	0
3	Uttan	1,562	791	726	45
4	Pali	99	88	0	11
5	Chowk	190	181	0	9
6	Tarodi	121	19	0	102
7	Dongri	290	213	77	0
8	Morva	169	0	169	0
	Total	4,383	3244	972	167

Source: Computed by superimposing Land Use Zoning proposals from MMR Plan – 2011 on the Base Map RTDZ – Recreation and Tourism Development Zone

G-1 – Green Zone

CW – Coastal Wetland

- Recreation and Tourism Development Zone (RTDZ): The RTDZ consists of / is defined to include:
 - a) Areas specifically marked in the Regional Plan
 - b) Places of recreation and tourism interest like:
 - Forts
 - Archeological and historical monuments
 - Major religious places
 - Objects, features, structures and places of architectural, natural and scientific interest and educational value.
 - c) A belt of 500 m around places mentioned in (b), but excluding existing Gaothan.
 - d) Hilly areas, plantation areas, forest areas, areas of natural scenery or other areas having recreational or tourism value.
- Green Zone (G-1): Such zones are seen as conservation areas where some amount of development is permitted to support activities that require space and are not viable within urban areas owing to high land values eg., institutions, resorts, etc.
- Coastal Wetland

2.6 Application of Coastal Zone Regulations, 2011 for MGU Notified Area

2.6.1 CRZ Extent

The Ministry of Environment and Forests, Government of India, under the provision of Environment (Protection) Act, 1986, has issued a notification in February, 1991, which was modified on January 06, 2011. The notification declared area stretch of 500 m. along the sea coast, bays and estuaries and up to 100 m. from the rivers and creeks as a Coastal Regulation Zone. The developments within this zone are required to be regulated in accordance with the provisions of the notification and the Coastal Zone Management Plans which are required to be prepared for every Planning area.

For those villages which fall under MBMC, CRZ maps prepared by Centre for Earth Science Studies (CESS) Kerala for MBMC area were procured. CRZ maps for area under MCGM were obtained from MCGM. These were superimposed on the base map and are shown in Map No. 11. The areas under various CRZ categories are as given below:

Table No. 2.8: Area under various CRZ Zones in the MGU Notified Area

Sl. No.	Name of Village	CRZ I (Ha)	CRZ II (Ha)	CRZ III (Ha)	Total CRZ (Ha)	No CRZ (Ha)	Total (Ha)	Village wise area under CRZ (%)
1	Manori	280	33	341	655	87	741	88
2	Gorai	599	62	256	917	293	1210	76
3	Uttan	794	120	107	1021	470	1491	68
4	Pai	0	59	0	59	40	99	60
5	Chowk	1	2	83	86	104	190	45
6	Tarodi	72	0	25	97	25	122	80
7	Dongri	77	0	26	103	187	290	36
8	Morva	109	0	32	141	27	168	84
Total		1932	276	870	3078	1233	4311	71
CRZ in MGU (%)		45	6	20	71	29	100	

Source: Calculated from the Base Map

In all about 71% of the MGU Notified Area is under CRZ. The CRZ regulations of 1991 are replaced by CRZ regulations of 2011 by the Ministry of Environment and Forests (MoEF), Govt. of India. As per the regulations of 2011, the High Tide Line is to be freshly delineated and a new Coastal Zone Management Plan (CZMP) prepared. Till such time these are prepared and got approved by the MoEF, the earlier sanctioned CZMPs are applicable.

As the CZMP of MGU Notified area was prepared in detail at 1:4000 scale by the above two organizations, the same is not superimposed on the Development Plan of MGU Notified area. This is to avoid any discrepancy leading to hardship. Therefore, the following is proposed

- All the provisions of this DDP are subject to CRZ regulations of 2011 governed through CZMPs
- Development Permissions in MGU Notified area shall be granted based on CZMPs
- For referencing the existing CZMPs, 1:4000 scale sheets of MCGM's sanctioned DP and 1:4000 scale CZMP maps of MBMC shall be used.

2.6.2 Activities permissible within CRZ

Table No. 29: Permissible Activities within CRZ as per Notification of 2011 (Relevant Provisions only)

Definition	Activities allowed	Activities not allowed
<p>CRZ -I Ecologically sensitive area</p> <p>Area between the Low Tide Line and High Tide line</p>	<p>a. Projects relating to Department of Atomic Energy, b. Pipelines, conveying systems including transmission lines c. Facilities that are essential for activities permissible under CRZ-I d. Installation of weather radar for monitoring cyclones</p> <p>The following activities are permissible in areas between LTL and HTL which are not ecologically sensitive:</p> <p>a. Exploration and extraction of natural gas b. Construction of dispensaries, schools, public rain-shelter, community toilets, bridges roads, jetties, water supply, drainage sewerage required for traditional inhabitants living within the biosphere reserves c. Salt harvesting by solar evaporation of sea water; d. Desalination plants e. Storage of non-hazardous cargo such as edible oil, fertilizers and food grain within notified ports; f. Construction of trans-harbour sea links, roads on stilts or pillars without affecting the tidal flow of water.</p>	<p>No Construction between HTL and LTL</p>
<p>CRZ -II Areas that have already developed (gothans) up to or close to the shore-line, in Municipal limits or legally designated urban area, with infrastructure</p>	<p>a. Building permitted on the landward side of existing or proposed road / existing authorized structure within shall be subject to town and country planning regulations including FSI/FAR. b. Reconstruction of authorized building permitted with existing FSI/FAR without changes in existing use. c. Facilities for receipt and storage of petroleum products and LNG d. Desalination plants and associated facilities e. Storage of non-hazardous cargo such as edible oil, fertilizers and food grain within Notified ports; f. Facilities for generating power by non-conventional power sources and associated facilities;</p>	<p>No building permitted on the seaward side of existing or proposed road (under CZMP of the area) or existing authorities structures</p>
<p>CRZ -III Area relatively undisturbed (coastal zones in rural area, developed or undeveloped, also areas within municipal units or other legally designated urban areas) and do not belong to category - I or II.</p>	<p>Within 200 m from HTL on landward side :</p> <p>a. Within 200m, repair of existing authorized structures not exceeding existing FSI, plinth and density b. Construction/reconstruction of dwelling units of traditional coastal communities including fisher folk between 100 and 200 from HTL</p> <p>Activities permitted:</p> <p>a. Agriculture, horticulture, gardens, pasture, parks, play field, and forestry; b. Projects relating to Department of Atomic Energy, c. Mining of rare minerals; d. Salt manufacture from sea water; e. Facilities for receipt and storage of petroleum products and liquefied natural gas f. Facilities for re-gasification of liquefied natural gas g. Facilities for generating power by non conventional energy sources; h. For shore facilities for desalination plants and associated facilities; i. Weather radars; j. Construction of dispensaries, schools, public rain shelter, community toilets, Bridges, roads, provision of facilities for water supply, drainage, sewerage, Crematoria, cemeteries and electric sub-station which are required for the local inhabitants may be permitted on a case to case basis by CZMA;</p>	<p>200 m from the HTL in case of seafront and 100 m along tidal influenced water bodies to be earmarked as "No development zone"</p> <p>No construction permitted in this zone</p>

Definition	Activities allowed	Activities not allowed
	<p>k. Construction of units or auxiliary thereto for domestic sewage, treatment and disposal with the prior approval of the concerned pollution control board or Committee;</p> <p>l. Facilities required for local fishing communities such as fish drying yards, auction halls, net mending yards, traditional boat building yards, ice plant, ice crushing units, fish curing facilities and the like;</p> <p>Between 200 t 500 m of HTL on landward side :</p> <p>a. Development of vacant plot in designated areas for construction of hotels or beach resorts for tourists or visitors</p> <p>b. Facilities for receipt and storage of petroleum products and liquefied natural gas</p> <p>c. Facilities for re-gasification of liquefied natural gas</p> <p>d. Storage of non-hazardous cargo such as, edible oil, fertilizers, food grain in notified ports;</p> <p>e. For shore facilities for desalination plants and associated facilities;</p> <p>f. Facilities for generating power by non-conventional energy sources;</p> <p>g. Construction or reconstruction of dwelling units so long it is within the ambit of traditional rights and customary uses such as existing fishing villages and goathans subject to local town and country planning rules with overall height of construction not exceeding 9mts with two floors (ground + one floor);</p> <p>h. Construction of public rain shelters, community toilets, water supply drainage, sewerage, roads and bridges by CZMA who may also permit construction of schools and dispensaries for local inhabitants of the area for those Panchayats, the major part of which falls within CRZ if no other area is available for construction of such facilities;</p> <p>i. Reconstruction or alteration of existing authorised buildings subject to (g) and (h) above</p>	
CRZ V Areas requiring special consideration	<p>CRZ areas falling within municipal limits of Greater Mumbai</p> <p>a. Construction of roads</p> <p>b. Slum Rehabilitation Schemes</p> <p>c. Redevelopment of dilapidated, cessed and unsafe buildings</p>	

Source: CRZ Notification dated 6th January, 2011

3 Analysis of the Existing Situation in the MGU Notified Area

3.1 Existing Land Use

Existing land-use for the entire notified area was interpreted from the satellite imagery which was subsequently authenticated through ground verification (Map No. 12). A 100% ground survey was carried out in gaothans and gaothan expansions¹.

3.1.1 Notified Area Survey (overall)

The following table gives the land use break up for the entire MGU Notified Area.

Table No. 3.1: Existing Land Use in the MGU Notified Area, 2011

No	Land Use		Area (Ha)		Total Area (Ha)	Area (%)
			MCGM	MBMC		
1	Residential		59.12	170.15	229.27	5.32
	1	Gaothan	20.48	25.49	45.97	
	2	Residential	38.63	143.17	181.80	
	3	Mixed Residential	0.01	1.49	1.5	
2	Commercial		52.05	24.27	76.31	1.77
	1	Retail	0.17	0.78	0.95	
	2	Govt. / Semi Govt. Offices	0.02	0.35	0.37	
	3	Hotels / Resorts	51.86	23.14	74.99	
3	Economic Activity		13.94	10.98	24.93	0.58
	1	Fish Drying Yard	13.92	10.60	24.51	
	2	Boat Building & Repairs	0.00	0.14	0.14	
	3	Workshops	0.00	0.00	0.00	
	4	Storage	0.03	0.24	0.27	
4	Social Amenities		8.58	51.12	59.71	1.38
4.1	Educational		0.36	11.22	11.58	0.26
	1	Primary School	0.36	0.08	0.44	
	2	Secondary School	0.00	11.14	11.14	
4.2	Medical & Health		0.00	1.18	1.18	0.02
	1	Hospital	0.00	1.11	1.11	
	2	Dispensary	0.00	0.01	0.01	
	3	Other	0.00	0.06	0.06	
4.3	Other Institutions		7.46	16.55	24.02	0.55
	1	Social / Welfare	0.12	8.11	8.23	
	2	Cultural	6.57	7.46	14.03	
	3	Place of Worship	0.77	0.98	1.75	
4.4	Utilities & Services		0.76	22.17	22.93	0.53
	1	Public Toilet	0.01	0.04	0.05	
	2	ESR / USR	0.00	0.00	0.00	

¹ Original settlement boundaries in the revenue sheets are called gaothans and the immediate expansion including the surrounding scattered development is termed as gaothan expansion.

No	Land Use		Area (Ha)		Total Area (Ha)	Area (%)
			MCGM	MBMC		
	3	Burial Ground / Crematorium	0.75	0.04	0.79	
	4	Landfill Site	0.00	22.03	22.03	
	5	Other Utility	0.00	0.06	0.06	
5	Recreation		32.49	0.20	32.69	0.76
	1	Park/ Garden	0.28	0.20	0.48	
	2	Theme / Amusement Park	32.21	0.00	32.21	
6	Transportation		15.31	12.39	27.70	0.64
	1	Road	12.76	12.26	25.02	
	2	Jetty	0.07	0.10	0.17	
	3	Parking Lot	2.48	0.03	2.51	
7	Agriculture		418.99	373.91	792.90	18.38
	1	Cultivated	331.41	228.19	559.61	
	2	Fallow	51.54	122.71	174.25	
	3	Plantation	36.03	23.01	59.04	
8	Quarry		0.35	7.49	7.84	0.18
9	Vegetation		106.76	62.70	169.46	3.92
	1	Dense Tree Cover	46.75	20.57	67.32	
	2	Sparse Tree Cover	60.00	42.13	102.13	
10	Water Bodies		73.38	67.27	140.65	3.26
	1	Creek	57.24	51.33	108.57	
	2	Lake/ Pond	16.14	15.94	32.08	
11	Wet Lands		836.86	1031.82	1868.68	43.33
	1	Marshy	216.46	74.61	291.07	
	2	Marshy with Vegetation	620.40	723.90	1344.30	
	3	Saltpan	0.00	233.31	233.31	
12	Hillocks		549.58	545.29	794.87	18.43
	1	Hillocks with Tree Cover	138.72	321.12	459.85	
	2	Hillocks Barren	110.85	224.17	335.02	
13	Waste Land		84.08	2.86	86.94	2.01
14	Rocky Outcrops		0.34	0.32	0.66	0.01
15	Beach		0.04	0.35	0.39	0.01
		Total	1951.87	2361.13	4313.00	100.00

The existing land use table shows that a majority of the area (43.32%) is under wetlands (mangroves and mud flats); which is indicative of a fragile ecosystem along the Manori Creek. This is followed by agricultural lands (18.38%) and hillocks (18.42%). The total developed area is only 10.94% (4.74 sq.km.) and it comprises of settlements.

Uses within the settlements include residential, commercial, economic activities (mainly related to fishing), social amenities, transportation and recreation. Further large scale developments capitalizing on the recreational potential of the peninsula, such as amusement parks (Essel World) and spiritual institutions (Global Pagoda) have also come up.

3.1.2 Detailed Survey of Gaothans and their Expansion

The land utilization pattern within the Gaothans and Gaothan expansion is given below.

Table No. 3.2: Existing Land use distribution in the Gaothans and Gaothan Expansions (Ha)

No	Gaothan	Residential	Commercial	Economic activities	Social Amenities	Recreation	Transportation	Vegetation	Water bodies	Total (Ha)	%age of developed area to total village area
1	Manori	14.40	8.35	13.65	0.61	0.04	3.14	0.00	0.00	40.19	6.14
	% With Manori	35.82	20.78	33.97	1.51	0.11	7.81	0.00	0.00	100.00	
	Gaothan	11.18	0.21	0.09	0.04	0.04	0.39	0.00	0.00		
	Expansion	3.22	8.14	13.56	0.57	0.00	2.75	0.00	0.00		
	Culvem	4.81	0.39	0.00	0.06	0.00	0.06	0.00	0.00	5.32	
	% With Culvem	90.44	7.34	0.00	1.06	0.00	1.16	0.00	0.00	100.00	
2	Gorai	18.60	40.96	0.00	6.68	32.21	12.76	0.29	0.01	111.51	9.21
	% With Gorai	16.68	36.74	0.00	5.99	28.88	11.44	0.26	0.01	100.00	
	Gaothan	4.93	0.23	0.00	0.09	0.00	0.21	0.29	0.01		
	Expansion	13.67	40.74	0.00	6.59	32.21	12.55	0.00	0.00		
	Uttan	65.19	4.24	4.39	38.69	0.08	8.27	0.00	0.00	120.87	8.11
	% With Uttan	53.94	3.51	3.63	32.01	0.07	6.85	0.00	0.00	100.00	
3	Pali	21.81	0.41	0.71	11.15	0.00	0.69	0.00	0.00	34.77	35.12
	% With Pali	62.73	1.18	2.03	32.06	0.00	1.99	0.00	0.00	100.00	
	Gaothan	1.12	0.07	0.00	0.00	0.00	0.00	0.00	0.00		
	Expansion	20.69	0.34	0.71	11.15	0.00	0.69	0.00	0.00		
	Chowk	41.97	0.38	4.18	0.23	0.02	1.28	0.00	0.00	48.08	25.31
	% With Chowk	87.30	0.80	8.70	0.48	0.05	2.67	0.00	0.00	100.00	
4	Tarodi	7.42	0.02	0.00	0.01	0.00	0.72	0.00	0.00	8.16	6.69
	% With Tarodi	90.85	0.26	0.00	0.07	0.00	8.79	0.00	0.03	100.00	
	Gaothan	5.24	0.02	0.00	0.01	0.00	0.14	0.00	0.00		
	Expansion	2.18	0.00	0.00	0.00	0.00	0.58	0.00	0.00		
	Dongri	12.64	0.03	0.00	0.13	0.00	1.61	0.00	0.00	14.40	4.95
	% With Dongri	87.77	0.18	0.00	0.89	0.00	11.16	0.00	0.00	100.00	
5	Morva	9.01	0.03	0.22	0.11	0.10	0.33	0.00	0.00	9.80	5.80
	% With Morva	91.94	0.31	2.25	1.12	1.02	3.37	0.00	0.00	100.00	
	Gaothan	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Expansion	7.26	0.03	0.22	0.11	0.10	0.33	0.00	0.00		
	Total	195.84	54.82	23.15	57.65	32.45	28.87	0.29	0.01	393.10	9.11

The existing land use table shows that a majority of the area in all the gaothan and its expansions is under residential use followed by commercial and industrial / storage (fishing and related activity). Gorai (37%) and Manori (28%) are popular tourist spots and have substantial areas under commercial use on account of resorts and lodges, shops and eating joints. Uttan (32%) has substantial area under social amenities. Majority of the structures are G and G+I in MGU Notified Area except in Uttan which also has some multi storied buildings. The total developed area constitutes only 10.94% of the total area of the Notified Area.

Manori : Manori is predominantly a fishing settlement with about 40.19 Ha of developed area. It is the southernmost settlement of the peninsula and has grown linearly between Manori-Gorai road and the coast. It is slightly elevated from the surroundings and has G and G+I structures. Manori is important from heritage conservation perspective.

Culvem : Culvem is located on the northern side of Gorai and has a developed area of about 5.32 Ha. It has grown linearly between Manori-Gorai road and the coast. The settlement is not so compact and is growing towards the coast and across the Manori Gorai road. Most of the structures are G, G+I. The structures are important from a heritage conservation perspective.

Gorai : Gorai is fast developing on account of the scenic beach, Essel World, Pagoda & several resorts. About 111.51 Ha (9.21%) of the area is developed. It has grown linearly between Manori-Gorai road and the coast. The northern part, above the creek is largely the fishing settlement and compact. The sprawl towards the south is somewhat sparse and is dominated by communities other than the fisher folks. Most of the structures are G, G+I. The structures are important from a heritage conservation perspective.

Uttan : Uttan is the largest settlement and shows the maximum expansion outside the gaothan between the Uttan Chowk road and the coast. About 120.87 Ha (8.11%) of the total village area is developed. Uttan is significantly urban in character. The gaothan does have some heritage structures but there is a considerable amount of transformation of the old fabric. A considerable amount of unauthorized construction is observed. It is one of the major fish catching centers and there is diversification of the economic base into other service activities as well.

Pali : Pali is a major fishing center and about 34.77 Ha (35.12%) of its total village area is developed. The settlement is in continuation with Uttan. The original gaothan is very small and there is significant amount of expansion around it. The Manori-Gorai road runs along the coast and the entire beach is dominated by fish drying yards.

Chowk : Chowk is a fishing settlement and about 48.08 Ha (25.31%) of its area is developed. The original settlement is very small and has not expanded naturally owing to a difficult topography and physical features. The entire expansion has occurred on the western side along the coast.

Tarodi : About 8.16 Ha (6.69%) of the total village area is developed. It has grown linearly along Chowk-Dongri road. The settlement has not grown or expanded much over the years. There are open areas within the existing gaothan boundary.

Dongri : About 14.40 Ha (4.95%) of the total village area is developed. The gaothan is a cluster of old houses with narrow streets and has grown on both sides of the Chowk-Dongri road.

One side of the road has the church along with a few structures and on the other side has the major settlement. The developed area is elevated on either side of the road. The original settlement has not expanded naturally owing to a difficult topography and physical features.

Morva : Morva is a very small settlement along the Uttan road and is located at the entry-point of the Notified Area. About 9.80 Ha (5.80%) of the total village area is developed. A number of new structures have cropped up in Morva on account of its proximity to the mainland.

3.1.3 Land Ownership Pattern

Apart from the Government owned lands there is a significant percentage of land under the institutional ownership.

Map No. 13 shows the land ownership pattern in the Notified Area. In case of full plots under a particular ownership, the entire plot is indicated and in case of hissas where the spatial extent was not available, the plot with the hissa is indicated with a symbol.

Table No. 3.3: Summary of Land Ownership in MGU Notified Area

Sl. No.	Land Ownership	No. of Plots / Hissas	Area (Ha)	Average land holding		% to total village area	% to total no. of plots
				sq m	ha		
1	Government	366	2,295.64	4,28,37,892	42.84	51.59	2.49
2	Institutional	148	68.12	29,77,823	2.98	1.53	1.01
3	Private	10,213	1,305.54	7,05,331	0.71	29.34	69.58
4	CTS without Owner	3,934	780.23	4,42,322	0.44	17.53	26.80
5	CTS without PC	4	0.00	0.00	0.00	0.00	0.03
6	Survey no. without Owner	0	0.00	0.00	0.00	0.00	0.00
7	Survey no. without 7x12	14	0.23	1,135.00	0.11	0.01	0.10
	Total	14,679	4,449.76*	4,70,76,867	47.08	100.00	100.00

*As per revenue land records

Source: Mahabhulekh Website, Government of Maharashtra

The government owns about 2,300 Ha of land which constitutes 52% of the total MGU Notified Area. Out of this, 115 Ha is leased out to the MTDC and about 349 Ha is under “No Development Zone” in the prevalent development plans for Mumbai and Mira Bhayander. The rest is under various uses such as gurcharan, nalas, roads, play grounds and such others.

About 68.12 ha (total 148 plots) of land is under institutional ownership, which is about 1.53% of the total MGU Notified Area. The biggest chunk of land belongs to Keshav Shrishti and its allied institutions² in Uttan (approx. 35.73 ha) followed by the Gagangiri Maharaj Trust (approx. 11.15 ha). 1,305.54 ha of land is under private ownership (total 10,213 plots), which constitutes only 29.34% of the total MGU Notified Area. This land is under residential and agriculture use or is fallow land.

Remaining 780.23 ha (total 3,934 plots) of land either does not have a clear ownership mentioned in the property card / 7x12 extract or no property cards / 7x12 records. This constitutes 17.53% of the total MGU Notified Area.

3.2 Road Network and Transportation

The MGU Notified Area is accessible via Kashimira Bhayander Road from Bhayander. All the settlements in the MGU Notified Area are well connected to each other and to the mainland (Mira Bhayander) by this road. The total length of this main road/spine from Morva (north) to Manori Jetty (south) is about 12 km. The width of the main spine varies from 6 to 4 m. The total length of the road network within the MGU Notified Area is about 30 km. There are three major

² Allied Institutions includes Uttan Krishi Sansodhan Sanstha (Keshav Shrushti), Uttan Van Aushdhi Sansodhan Sanstha, Uttan Vivid Lakshmi Shikshan Sanstha and Ram Bhav Magi Prabhodini Sanstha

nodes along this north-south road namely the Dongri settlement node, Uttan police post near Bhut bungalow and Gorai cross near rickshaw stand (Map No. 14).

Buses are the main mode of public transport for people to move in and out of the MGU Notified Area. The buses are operated by Maharashtra State Road Transport Corporation (MSRTC) from Bhayander and Thane to MGU Notified Area. MSRTC plies buses within the MGU Notified Area. Of these, 2 buses are exclusively from Bhayander to Essel World/Gorai jetty, a very popular entertainment and recreational destination. There are 63 bus stands within the planning area and the frequency of the bus service is good. Auto rickshaws are the other modes of transports with the MGU Notified Area.

The MGU area is also accessible by ferries plying from Borivali and Marve jetty.

3.3 Social Infrastructure and Amenities

The social infrastructure has been classified under the following categories:

- Education includes primary and secondary schools
- Health includes dispensaries/health centers
- Open spaces
- Other amenities includes, banks, burial grounds, credit/cooperative housing societies, community halls/marriage halls, public toilets, gymnasiums, local markets, police stations, post offices etc.

3.3.1 Education

The MGU Notified Area has a fairly well distributed and adequate educational infrastructure for the present day population. There are 2 government run primary schools and 2 private secondary schools within MCGM's jurisdiction serving a population of 9,552. There are 7 primary schools, 1 government run and 5 church run/private upper primary/secondary schools within MBMC's jurisdiction serving a population of 28,367. Map No. 15 shows the spatial distribution of the educational facilities in MGU notified area.

3.3.2 Health

There are 2 municipal dispensaries within MCGM's jurisdiction, one in Manori and the other in Gorai with a medical officer in each dispensary. There are about 6 private dispensaries/clinics in Manori and 2 in Gorai. In addition, there is one Public Health (PHC) Center- in Gorai but no health facility in Manori.

There is one primary health center in Pali run by the Zila Parishad within the MBMC's jurisdiction. The 6 bedded PHC has 1 Medical officer, 1 LHV (Lady Health/help Visitor), 1 Leprosy Technician, 3 ANM (Auxiliary Nurse Midwife) and 1 MPW (Multi Purpose Worker). There is one post for an urban health officer in Pali to be filled in by the Municipal Corporation. There are at present 5 private hospitals; 4 in Uttan and 1 in Pali and about 20 private clinics / dispensaries within the MBMC's jurisdiction. Among these 3 to 4 clinics have MBBS Doctors, while rest has BAMS Doctor. Out of these private clinics 12 clinics are at Uttan, while Morva, Pali, Chowk, Tarodi & Dongri have 8 clinics which are run by BAMS doctors. Map No. 16 shows the spatial distribution of the health facilities in MGU notified area.

3.3.3 Open Spaces

The open spaces are generally in the form of small playgrounds attached to municipal schools or small play areas within church premises. There are very few designated parks and gardens developed by MCGM and MBMC. The total available open space is about 0.69 ha which works out to be 0.18 sq. m. per person (based on census 2001 population). Map No. 17 shows the spatial distribution of the open spaces within the planning area.

Table No. 3.4: Existing Open Spaces

Sl. No.	Village	Location	Type of Open Space	Area (Ha)
1	Manori	Manori	Municipal Park with play facilities like rides, sandpits etc.	0.04
2	Manori	Manori church premises	Playground	0.17
3	Gorai	Near Gorai Church	Playground	0.01
4	Uttan	Near Uttan Water tank	Garden	0.09
5	Uttan	Near St. Joseph school	Garden	0.36
6	Chowk	Chowk	Vir Chimaji Appa Memorial Garden	0.02
Total				0.69

3.3.4 Other Amenities

There are various public amenities within various villages of MGU Notified Area such as open spaces, banks, burial ground / crematorium, community hall / marriage hall, community toilets, local markets, parks / gardens, police stations / posts, post / telegraph office etc. Map No. 17 shows the spatial distribution of other amenities in the notified area.

3.4 Recreation and Tourism

MGU Notified Area has a unique geographical diversity with sandy beaches, rich mangrove cover, ridges and cliffs. The Gorai beach and the Essel World, a major amusement park are the most popular amongst the tourists. Many tourists also come to visit the Global Pagoda, which has the distinction of being the highest Pagoda in the world. The area also has rare geological rock formations. The other attractions are the old fishing settlements, old Portuguese churches, lighthouse and fishing jetties etc. The picturesque beaches and hillocks are popular locations for film, TV serials and advertisement shoots.

A survey of all the sites with tourism potential and existing tourism establishments (resorts / hotels) in the MGU area was done. A visitor perception survey was also carried out before commencing the preparation of the development plan.

3.4.1 Survey of Sites

Tourism is an established and fast growing activity in the notified area. Several sites in the area have heritage, historical, religious, cultural, recreational and ecological significance. Although not well known, these locations have the potential to be developed as tourist attractions. In all, 29 such sites have been enumerated and documented in the MGU Notified Area as shown in Map No. 2.

3.4.2 Survey of Establishments

An assessment of the establishments including general shops as well as those supporting tourism such as hotels and resorts was carried out. Data regarding registered establishments was obtained from MCGM and MBMC. In addition, several other unregistered establishments were also added to the list. A summary of the existing establishments is given below:

Table No. 3.5: Summary of Registered and Un-Registered Establishments

Sl. No.	Village	Registered Establishments			Un Registered Establishments	Total Tourist Establishments (4+6)
		Total	Tourist	Shops	Tourist	
1	2	3	4	5	6	7
1	Manori	20	5	15	2	7
2	Gorai	90	26	64	16	42
	MCGM (a)	110	31	79	18	49

S. No.	Village	Registered Establishments			Un Registered Establishments	Total Tourist Establishments (4+6)
		Total	Tourist	Shops	Tourist	
1	2	3	4	5	6	7
3	Ut tan	4	3	1	7	10
4	Pali	0	0	0	2	2
5	Chowk	1	1	0	2	3
6	Tarodi	1	0	1	0	0
7	Dongri	6	4	2	1	5
8	Morva	0	0	0	0	0
	MBMC (b)	12	8	4	12	20
	Total (a+b)	122	39	83	30	69

A detailed survey was carried out in about 69 tourist establishments based on various criterion namely accessibility, area, type, status, kind of accommodation, no. of rooms, occupancy, occupants' purpose of visit, average duration of stay, profile of tourists, facilities available, maintenance, management, employment generated etc

The key findings of the establishments' survey are:

- The area being a popular getaway, many tourists/visitors come from nearby places. This has led to the mushrooming of hotels, resorts, restaurants and other accommodation which are easily accessible by public mode of transport.
- There are only three 2 star hotels and the rest are general category hotels. Most of these hotels offer a choice of A/C and non A/C rooms. The per day charges vary from Rs. 251/- to Rs. 500/- for non a/c rooms and from Rs. 501/- to Rs. 750/- for a/c rooms.
- The occupancy rates are about 25% to 50% during weekdays and about 90% to 100% during the weekends. The duration of the stay of the tourists is very short - not more than a day or two.
- Majority of the tourists belong to lower middle and middle income group. This is because of the fact that high-end tourism has not been promoted in the area.
- Most of the establishments do not have facilities such as board rooms, pubs, swimming pools, gymnasiums etc. and the general maintenance of most of the hotels and establishments does not confirm to high standards.
- Almost 95% of the hotels and establishments are owner held and managed enterprises, indicating that most of it is still an unprofessionally managed / low scale activity. Owners of the hotels and establishments perceive that the area has potential to be developed as a tourist destination of national/international standards. They are of the opinion that encouraging new activities and additional attractions like heritage walks, horse and pony rides, nature trails / rock climbing / camping and water sports will attract more tourists to the area.

3.4.3 Visitor Perception Survey

A visitor perception survey of about 100 tourists in the area was carried out to get a general idea of the tourists' profile visiting the area. The survey was based on a number of aspects such as place of residence of the tourists, age and travel group, number of visits per year, preferred time of visit, duration of stay, preferred route and mode to reach the destination, preferred locations within the area, problems faced during the stay and awareness about other interesting locations in the area.

The key findings of the tourists' survey are as follows:

- MGU Notified Area is popular as the nearest one-day getaway for the people from nearby areas of Mumbai especially the western suburbs and Mira-Bhayander. Though the area has

many natural features owing to the topographical variations, the tourists are only aware of the beaches of Manori and Gorai and the amusement park called Essel World/ Water Kingdom.

- The area is popular amongst youngsters who visit the area in groups for parties and picnics. Majority of the tourists visit the area at least twice or more in a year and the duration of the stay 1 day.
- Majority of the tourists prefer to reach the area via ferry from Marve to Manori followed by Borivali to Gorai. A very small portion of the tourists come by road via Bhayander.
- Tourists are not satisfied with the facilities and amenities available in the area. Majority of the tourists would like to see pubs, water sports, pony rides and nature trails/camping in the area.

3.5 Environment

MGU Notified Area has a well preserved landscape and a fragile/sensitive eco-system. More than 50% of the land in this area has environmental features such as wetlands/mangroves, vegetation, water bodies, hillocks, rocky outcrops and beaches (Map No. 18). The predominant geographical features of the area are described below.

3.5.1 Mangroves

Almost 1,635 ha (37%) of land in the notified area is covered by mangroves. Avicennia Marina is one of the prominent species found the area. Uttan has the largest expanse of mangrove cover followed by Gorai and Manori.

3.5.2 Ridges/Hillocks

The area has a number of knolls /hillocks along with three ridges running in the north-south direction that are separated by fertile plains. The rock formation in the MGU Notified Area is constituted mainly of Deccan Basalt, granites, gneisses and laterite. One of the ridges trends up to the northern most tip of the MGU Notified Area and ends in a cliff with a unique and rare columnar basalt formation. Majority of the hills have good vegetative cover with intermittent patches of barren rock surfaces.

3.5.3 Water Bodies

There are as many as 60 water bodies in the notified area. Water flows down the hill slopes during monsoons and collects in these ponds/water bodies. Most of them retain water for about 4-5 months and then dry up. The larger ones retain water throughout the year. The total area under water bodies in the MGU Notified Area is 32.08 Ha which is almost 0.74% of the total area.

3.5.4 Environmental Parameters

The qualitative aspects of other environmental parameters such as air quality and water quality were found to be considerably satisfiable.

Sea Water Quality

Water sample collected from Manori has a pH value ranging from 7 to 9 and that from Uttan beach ranges from 7 to 8, which is good for survival of fish. Sample collected from Manori beach has a pH of 4.8 (average) which is slightly below the required level for survival of aquatic life whereas Uttan beach water has an average of pH 5.4 which is slightly above the minimum required. Samples collected from Manori beach have COD 202.5 mg/l (average) and at Uttan beach the COD is 141.1 mg/l (average), which is within the permissible limits. Sample collected from Manori beach has a BOD of 23.2 (average) and that from Uttan beach has a BOD of 8.6, which is again within the permissible limit.

Air Quality

The MGU Notified Area is located on the north western side of Greater Mumbai. The general wind direction is leeward i.e., from the west. As a result, the MGU Notified Area is not affected

by the pollution created by industries or heavy traffic from the mainland. Moreover the MGU Notified Area being a predominantly No Development Zone and devoid of any air polluting industry has no major issues pertaining to air pollution.

3.6 Water Supply

Water is supplied by MCGM in Manori and Gorai and by MBMC in Uttan, Pali, Chowk, Tarodi, Dongri and Morva. An extensive assessment of the water supply system (source, treatment and distribution network) was carried out (Map No. 19).

The water supply network for Gorai and Manori area was commissioned in 1996 – 1997. The water is sourced from Tulsi and Vihar lakes and treated water is supplied from Bhandup complex. Approximately 1.5 to 2 MLD of water is supplied to Manori and Gorai. Water is supplied solely for drinking and domestic purposes. Water from local sources is used for irrigation and fishing related activities. Essel World meets its water requirements from bore wells and tankers.

Uttan, Pali, Chowk, Morva, Dongri and Tarodi settlements receive water from the centralized water supply system of MBMC. About 2.44 MLD of water is supplied for drinking and domestic purposes. It works out to about 86 LPCD which is less than the minimum supply of 135 LPCD for municipal areas prescribed by CPHEO. Water from wells is used for irrigation and fishing related activities. The tourist establishments entirely rely their own bore wells or purchase water from other well owners which are supplied through tankers.

3.7 Sewerage

The settlements of Manori-Culvem and Gorai do not have an underground drainage system at present. There are open drains along the streets that carry sillage into the creeks/sea. Only some parts of the settlement have individual toilets. People in the remaining areas practice open defecation.

There is no underground sewerage network in any of the 6 settlements of MBMC under the MGU Notified Area. These settlements have surface drains. These drains are lined with cement concrete. The drains are covered with concrete slabs in Uttan, Morva, Dongri, and Tarodi. These 6 settlements have 29 km of open drains. It is observed that sillage from drain flows into the sea/creek directly in case of Uttan, Chowk, Pali, Morva, Tarodi and Dongri.

3.8 Solid Waste Management

Solid waste management is important for maintaining the quality of life and environment of a town or city. The solid waste and sanitation department of Municipal Corporation of Greater Mumbai (MCGM) is responsible for management of solid waste in Gorai and Manori area and the solid waste department of the Mira Bhayander Municipal Corporation (MBMC) is responsible for solid waste management in Uttan, Pali, Chowk, Tarodi, Dongri and Morva.

MCGM manages the task of solid waste management in-house with its own staff. In all about 12 workers are assigned for solid waste management for each of the villages of Manori and Gorai along with a common supervisor. Additional staff is hired on contract basis as and when required. There is no door to door collection system in Manori and Gorai. All main streets of the settlements are cleaned daily. Approximately 5 tons of garbage is generated per day in Manori and Gorai. This works out to about 50 gm / person / day which is too low to be realistic and is

indicative of inefficient collection. A dumper with capacity of 15-16 cum makes 8 trips from Gorai in a day to carry the solid waste from Manori. Manori has been adopted by an NGO under the scheme 'Dattak Vasti Yojana'. The NGO provides necessary equipments to the workers like gloves, brooms, etc. The beaches in Manori and Gorai are occasionally cleaned. No solid waste management charges are levied. Large establishments like Essel World are responsible for collecting the waste within their premises and ensuring disposal. Essel World has a well functioning vermiculture plant for biodegradable wastes within its premises. The non-degradable waste is compressed and disposed off.

The task of solid waste collection and disposal in the MBMC area is privatized. The six villages of MGU under MBMC's jurisdiction fall in Solid Waste Collection Zone 1 and 3. About 209 workers are responsible for door to door collection, road sweeping and cleaning. Door to door collection is done in the settlements of Uttan, Pali, Chowk, Tarodi, Dongri and Morva. Approximately 400 tons of waste is collected per day from the 6 settlements which works out to about 1.4 kg /person. This is considerably higher than the usual norm of about 400 gms / person / day and could be attributed to the waste generated from fishing activity. The waste is collected in a tempo and is transported to the dumping site. No solid waste management charges are levied on the households. However, a fixed rate of Rs. 300 / month is levied on mutton / chicken shops, hotels, bars and wine shops. A new solid waste dumping site has been developed in Uttan for dumping the waste generated in MBMC area (Map No. 20).

3.9 Economic Activity

The major economic activities in the MGU Notified Area are fishing & allied activities, agriculture, salt farming and tourism (Map No. 21). Tourism is emerging as a major economic activity and hence, is dealt with separately and in depth in Section 3.4.

3.9.1 Fishing and Allied Activities

Fishing is the predominant activity in the area and is extensively practiced in Manori, Gorai, Uttan, Pali and Chowk. There are extensive fish drying yards in Manori-Culvem and Gorai. Uttan and Pali have large fish drying tracts all along the beach. Rocky surfaces have been cut and surfaced with concrete to create fish drying grounds in Chowk. Women are actively involved in the fish processing activity. In addition to these, there is a large fish drying yard in Manori adjacent to the Gagangiri temple.

Manori and Gorai villages fall in the Manori zone of Greater Mumbai and Uttan, Pali Chowk fall in the Uttan zone of Thane district. The contribution of the fish catch of Manori zone to that of Greater Mumbai was about 7.79% in 1999-2000 which came down to 5.91% in the year 2003-2004. The fish catch of Uttan zone to Thane district was 22.34% in 1999-2000 which came down to 16.19% in the year 2003-2004. Many fishermen have expressed concern over the decline in the fish catch and increase in the distance to get a decent catch which earlier was available much near the coast. Now fishermen have to be on sea for 15 days at a stretch and they go up to the Gujarat Coast to get a good catch. Some of the common fish variety that is caught is Katla, Prawns, Shrimps, Pomphret, Bombay duck locally known as Bummalo / bombil, crabs etc. Many fish are dried and salted, especially the Bombay Duck and Shrimps.

There is one ice factory in Uttan, which supplies ice throughout the area. The ice from this factory is not sufficient and hence, the fish has to be sent directly to the markets. Also there is no cold storage facility in the area.

As fishing is a major activity, boat building and repairing are other allied activities in the area. Boats used by the fisherman are usually made in Gorai or Pali. MGU notified area has about 655 mechanized and 171 non-mechanized boats.

3.9.2 Agriculture and Plantation

Agriculture is the next major economic activity in the MGU Notified Area. There are large tracts of land about 18.33% of the entire area under agriculture. Paddy and vegetables are grown in the area. Vegetables are supplied to vegetable the market of Mumbai. Maximum land under agriculture and plantation is in Manori and Uttan which is around 32.50% & 24.24% respectively. Agriculture is still non-mechanized and subsistence agriculture is practiced.

3.9.3 Salt Production

About 5.40 % of the total land in MGU Notified Area is under salt pans on the northeastern side of the Notified Area due to proximity to the creek.

4. Development Issues, Vision, Objectives and Strategies

This chapter outlines the development strategies proposed for the MGU Notified Area. The following process was followed:

- An in-depth study & analysis of the planning area with respect to key development issues facing the area was carried out based on the consultations with various stakeholders in the area and the concerned planning agencies
- A detailed review of all the statutory plan provisions for the planning area was done and relevant proposals were kept in view.
- Vision statements of the area as a whole and across plan components were prepared. Further development objectives and development strategies were listed down.
- The development plan was prepared based on the above inputs
- Schematic proposals have been charted out for the following components :
 - Land Development
 - Road Network and Transportation
 - Recreation and Tourism
 - Social Infrastructure and Amenities
 - Environment
 - Water Supply
 - Sewerage
 - Solid Waste Management
 - Economic Development

4.1 Development Issues

1. Conflict between meeting the demand for development and preserving the ecology of the area.

By virtue of being located very close to the city of Mumbai, the MGU Notified Area is facing increasing demand for development:

- It functions as a 'weekend getaway' for the residents of Mumbai and nearby areas. In a response to meet the recreational needs of the nearby areas several establishments providing facilities to the tourists have sprung up in an adhoc manner. Its potential of being developed as special area for recreation for the residents of Mumbai and nearby areas is recognized and there is a demand to open up the area for development in order to provide recreational and tourism facilities.
- With both Mumbai and Mira Bhayander being saturated in terms of development and with no major tracts of open/undeveloped areas in the vicinity, the MGU Notified Area appears to be an attractive option to open up new areas for development. It is an instance of urbanization slowly creeping into environmentally sensitive areas.
- The settlements themselves are witnessing growth and there is a need for land for expansion and economic activities (fishing and allied activities).

The MGU Notified Areas has several ecological features:

- Mangroves which are crucial for supporting the fishing activity, protecting the shoreline and housing a wide variety of fauna
- Hillocks with vegetation cover supports a wide variety of flora and fauna and are amongst the few large greens amidst intensively developed cities of Mumbai and Mira Bhayander
- Creek inlets which support the growth of Mangroves
- Fertile lands where agriculture and horticulture is still practiced

Any planning intervention in the area must attempt to balance the demand for development and the need to preserve the ecological features at the same time. The key challenge lies in managing the equilibrium between the human activities and the environment. The nature of development promoted should take cognizance of the rich natural resources of the area and be inclusive of the needs of the local community

2. No Development Zones/Green Zones in the DPs of MCGM and MBMC have led to 'unauthorized' developments.

Currently major portions of the MGU Notified Area are under various regulations that restrict development in the entire area

- In the Development Plan for Mumbai majority of the area is designated as No Development Zone owing to the rich mangrove cover. Of the total area of 19.52 sq km of Manori and Gorai only 0.58³ sq km is opened up for development.
- In case of the Development Plan for Mira Bhayander, a major portion of the area is under No Development Zone and Hills. Of the total area of 23.61 sq km only 2.09 sq km is opened up for development. The DP does not clearly state the activities permitted on hills, although portions of hills are designated for tourism purpose.
- The CRZ regulations override both the Development Plans as the area under CRZ (CRZ I, CRZ II and CRZ III collectively) is about 30.80 sq km.

The rationale for such zoning and development restrictions is to preserve the ecological features in the Notified Area and indeed it is owing to this, that much of the area has been preserved. But over time this has led to unauthorized developments – most of the expansions of the gothans and resorts & establishments to support the tourism activity are unauthorized and this makes it difficult to provide infrastructure and access at a later point.

Any planning intervention in the area must open up adequate area for development in a manner that meets the demand but at the same time does not end up negatively impacting the ecology of the area.

3. Insufficient and inadequate connectivity within the settlements and with the main land makes it difficult to provide access to infrastructure.

Presently there is one main road running in the north-south direction that connects all the settlements with the main land. Travel by road is more time consuming as compared to travel by water. The planning area is well connected with Mumbai by water transport through frequently operated ferries; however, these are ill maintained..

This makes it difficult to access higher level emergency services or higher educational facilities available in Mumbai and Mira Bhayander. It is also difficult for MCGM and MBMC to provide solid waste management services regularly.

A limited connectivity has resulted in some difficulty in accessing and providing infrastructure but at the same time it is for this very reason that the area has been preserved so far. Hence the solution may not lie in traditional approach of providing direct and wide road access.

Any planning intervention to increase the connectivity within settlements and main land must be such that it facilitates the required access but at the same time does not make the entire area accessible otherwise it will end up negatively impacting the ecology of the area.

4. Centralized solutions to providing basic infrastructure – water supply, sewerage and solid waste management are unlikely to solve the problem of insufficient

³ Areas worked out from transferring the proposed land uses from the Development Plans of Mumbai and Mira Bhayander on to the final Base Map for the MGU Notified Area.

basic services in the village settlements and new demand that will arise owing to growth and tourism

- Water supply – All the settlements in the MGU Notified Area have access to piped water supply provided by MCGM and MBMC. The present supply is adequate enough for the resident population of the area however will need to be augmented for new growth. The resorts tap limited amount of water available from the municipal sources and extract ground water. With an increase in the tourism activity the demand for water will intensify and to meet the entire demand via centralized networks will be expensive and difficult given the network lengths and terrain.
- Sewerage – In both MCGM and MBMC areas, there are open / covered drains for sullage and grey water and the sewerage is disposed into individual soak pits. This situation meets the present requirements but with increase in tourism related economic activities these will be inadequate. Centralized waste treatment systems would be expensive and difficult in view of the terrain.
- The solid waste in MCGM area is collected by municipal staff and dumped at certain identified spots. The streets are not deaned on a regular basis. The solid waste collection MBMC area is privatized and is done on a daily basis. Lack of connectivity is the major constraint in facilitating regular collection of solid waste. It will be more appropriate to emphasize segregation of waste, localized treatments for biodegradable wastes and collection of non degradable waste only.

4.2 Vision Statement, Development Objectives and Strategies

4.2.1 Overall Vision, Objectives and Strategies

Vision

- The balance between ‘Developmental Activity’ and the ‘Sensitive Environment’ is well managed.
- The quality of life is good for the residents with ample economic opportunity, good infrastructure and amenities.
- There are a variety of high quality tourism activities for the people of Mumbai and MMR and visitors to Mumbai.
- Tourism is developed in a manner that preserves the ecology of the area and is non disruptive to the local residents.

Objectives

- To ensure a pattern of development that is sustainable and responsive to the ecological features.
- To enhance the living environment in the settlements.
- To develop a range of recreational activities catering to various income groups and their needs.
- To continue supporting and strengthening the local economic activities.

Strategies

- Selectively open up areas for development, leaving the ecologically sensitive areas undisturbed – delineate developable and non developable areas.
- Concentrate new development adjacent to the existing developments.
- Carry out a fine grained zoning to enhance the character of the area and ‘zone’ based development regulation rather than use-based regulation to get a harmonious built form.
- Develop multiple recreational nodes based on the potential of the existing sites.
- Introduce new economic activity without compromising the existing activities or the ecological features.

- Explore alternative means/mechanisms for infrastructure provision
- Link the development of open spaces and water bodies
- Provide essential social and public amenities, by adopting appropriate planning standards and make the implementation equitable and fair.

4.2.2 Land Development

Vision

- The interaction between the environment and human activity is well managed
- Land is utilized in an efficient and sustainable manner
- Growth is regulated, there is a harmonious co-existence of existing settlements, new developments and the environmental features
- Environmental and heritage assets are conserved and enhanced

Objectives

- To provide land for expansion and planned growth around the village settlements
- To achieve compact and efficient urban form
- To regulate growth and development in a manner that is responsive to and enhances the natural features
- To provide land for tourism and recreation activity and ensure that such activity is compatible with the surrounding environs
- To review the reservations for social infrastructure and amenities in the current plans

Strategies

- Delineate very clearly the development areas – settlement expansion, tourism areas – and no development areas – mangroves, hills/plantations/forests, and agriculture. The separation of the two areas to be very clear and unambiguous, using roads or natural features as boundaries between the two
- Undertake fine grained zoning and frame regulations to support the emergence of special character, preserve certain features and facilitate specific activities
- Develop special elements – gateway/entry points, viewing points etc
- Explore alternatives to the traditional way of providing social and public amenities

4.2.3 Road Network and Transportation

Vision

- The connection with Mumbai is convenient, efficient and well designed, facilitating easy movement of tourists and residents
- The road network is efficient – providing accessibility to all settlements and places of tourists' interest while leaving the ecologically sensitive areas untouched at the same time.
- The road network design supports public transport system
- The streets are designed, fully developed and pedestrian friendly

Objectives

- To provide efficient connectivity with the mainland
- To ensure the smooth movement of tourists and local residents
- To ensure access to and interconnectivity in the 'development zones'
- To ensure that the ecological areas are not disturbed
- To design appropriate street sections that make them friendly for pedestrians and non motorized modes

Strategies

- Develop appropriate linkages with the main land which do not encourage direct vehicular access in to the area but are non intrusive to the mangroves at the edge

- Plan a road network that connects the 'developable zones' thus enhancing their growth and preserves the 'non developable zones' by discouraging through traffic within these
- Design appropriate street sections that encourage pedestrian movement and are in harmony with the surroundings.

4.2.4 Social Infrastructure and Amenities

Vision

- Adequate basic and higher educational facilities are available and easily accessible
- Adequate basic and higher level / emergency health facilities are available and easily accessible
- Adequate public amenities such as open spaces, public toilets etc are available
- Adequate amenities to support the recreation and tourism activity such as information centers, public toilets, amenity areas, parking areas etc. have been provide for.

Objectives

- To ensure that adequate basic health, education and public amenities are provided in a manner that is fair and equitable

Strategies

- Identify all government lands in the Notified Area and locate, to the extent possible, public purpose reservations on government lands. This is in order to reduce hardship of private land acquisition.
- Minimize the extent to which these need to be provided – provide only those which cannot be fulfilled by the private sector or those that are location-specific.

4.2.5 Recreation and Tourism

Vision

- A wide spectrum of recreational activities and tourism types ranging from adventure, cultural, heritage, nature, leisure, wellness, culinary, lifestyle, media & entertainment is available.
- The MGU Notified Area is a popular venue for business, entertainment and media events
- The area is tourist friendly and offers high quality amenities

Objectives

- To develop a wide variety of tourist attractions, catering to all income groups without causing conflict with the aspirations and needs of the local residents
- To provide a conducive environment and suitable infrastructure that makes the stay pleasurable and convenient for the visitors and tourists
- To develop tourism and recreational activity through judicious utilization of ecological resources and building upon the local resources
- To safeguard local culture by proposing heritage and cultural tourism To propagate and create awareness about the tourism and recreational activities available in the MGU area in main land of Mumbai and surroundings

Strategies

- Identify sites of ecological, cultural, heritage, adventure, amusement and recreational (nature based) significance having tourism potential in the MGU Notified Area and develop them –
- Enhance the environment of the lesser known sites by planning a wider area around them to improve the quality of built environment
 - Providing good quality infrastructure facilities and amenities
 - Improving their accessibility
 - Connecting them with the existing popular attractions
- Utilize the natural/ecological resources for tourism and recreational activity
 - Create nature parks in rich biodiversity zones
 - Promote passive tourism on summit point of sea facing ridges and other such locations

- Promote trekking/paragliding and other adventure sports at favorable sites
- Enhance the heritage/cultural value of MGU Notified area
 - Upgrade/renovate the old heritage structures
 - Prevent encroachment around significant heritage precincts and structures
 - Popularize the cultural heritage through heritage walks, brochures and media
 - Promote local festivals and cultural events as visitor attraction.
 - Actively market both the developed and potential sites by way of brochures, media etc
- Restrict the high end recreational activity to designated locations.
- Create awareness among the people and make it a tourist friendly destination
- Provide tourists with adequate information – signage, brochures, information kiosks, maps, guide books etc

4.2.6 Environment

Vision

- The development is carried out in a sustainable manner
- Ecological resources are conserved and enhanced
- Waste is efficiently managed with emphasis on recycle and reuse
- Tourism and recreational activities are developed in an environment friendly and sustainable manner
- There are adequate open spaces for the community's needs

Objectives

- To promote sustainable development – preserve and enhance the ecological resources
- To create open spaces

Strategies

- Delineate no 'development zones' / conservation zones – mangroves, hills, creek inlets and water bodies and preserve their special characteristics through special development control regulations.
- Specifically delineate / identify tourism and recreational activities for intensive development and allow low order facilities in other zones
- Link development of the water bodies with open spaces as recreation areas
- Create awareness among residents and visitors/tourists to preserve natural features in the area

4.2.7 Water Supply

Vision

- There is adequate, safe and clean drinking water for both the residents and the tourist population
- The water supply system is efficient and well managed
- People are aware and sensitive to conserving water resources

Objectives

- To promote utilization of water resources in sustainable manner
- To provide safe and adequate drinking water

Strategies

- Explore alternative options to meet the water requirements versus tapping centralized water sources for Mumbai and Mira Bhayander – rain water harvesting, water bodies, recycling and reuse of water
- Discourage individual solutions to water supply such as bores to prevent indiscriminate exploitation of sub surface water through a system of penalties / incentives

4.2.8 Sewerage

Vision

- There is an efficient sewerage system serving both the residents and the tourist population
- Sewage generated is treated and disposed off in an environment friendly manner with emphasis on reuse of treated water

Objectives

- To ensure appropriate treatment of sewage generated in the residential and other developable areas
- To ensure adequate treatment of sewage and recycling of waste water
- To ensure disposal of sewage in a safe and environment friendly manner

Strategies

- Explore alternative decentralized options to treat the sewage generated at settlement level which involves recycling and reuse of water versus centralized systems

4.2.9 Solid Waste Management

Vision

- The beaches and settlements are clean
- Solid waste management system is efficient and well managed
- Solid waste generated is recycled, reused or treated and disposed off in a scientific and environment friendly manner

Objectives

- To keep the settlements and beaches clean and hygienic
- To dispose off the waste in an environment friendly manner with maximum possible reuse and recycling of waste

Strategies

- Encourage segregation of waste at source at both household level and in public areas
- Encourage reuse and recycling of wastes
- Introduce safe and environment friendly solid waste disposal techniques
- Discourage dumping of wastes in ecologically sensitive area

4.2.10 Economic Development

Vision

- Tourism fuels the economic growth of the area
- The traditional economic activities such as fishing, boat making, agriculture and salt farming continue to co-exist as an added attraction for the tourists

Objectives

- To promote tourism and bring about sustainable economic development
 - Create new employment opportunities involving the locals
 - Conserve ecological environs– mangroves, salt pans, tree cover, water bodies and heritage structures
- To safeguard the means of traditional livelihood in the area

Strategies

- Clearly delineate tourism and recreational areas and provide access to them
- Promote fishing activity by earmarking specific locations and allocating adequate land for fishing and ancillary economic activities
- Facilitate setting up of institutions to upgrade the skill sets of the residents to cater to the hospitality and entertainment industry in specific zones

- Promote high value added agricultural activities - agriculture, horticulture, floriculture and vegetable farming

4.3 List of Proposals

This section lists down all the proposals that are crucial for the development of the notified area. The proposals can be categorized as follows:

- Statutory provisions to enable implementation / facilitation of the proposed projects includes zoning, reservations, general development controls regulations and other actions that may be required.
- Capital investments include investments in physical and social infrastructure and other projects that are essential for the development of the planning area.
- Policy initiatives include regulatory actions to be taken up by different agencies.
- Suggestions/recommendations to undertake further detailed studies for projects that are necessary for transforming the area

The Development Plan will thus form the framework for efficiently channelizing investments across the sectors.

4.3.1 Land Development

- 1 Demarcation of various land use zones
- 2 Calculation of population holding capacity
- 3 Delineation of heritage precincts
- 4 Preparation of development control regulations
- 5 Identification and appropriate utilization of government lands in the Notified Area

4.3.2 Road Network and Transportation

- 1 Preparation of a structure plan for road network and transportation:
 - New links
 - Road improvement
 - Junction improvements
 - Pedestrian trails / hiking trails
 - Parking provisions
 - Bus depot
- 2 Guidelines for designing roads and pedestrian trails
- 3 Refurbishing the existing jetties and developing facilities around them:
 - Manori jetty
 - Gorai jetty
 - Essel World jetty
 - Borivali jetty
- 4 Building new jetties and developing facilities around them:
 - Global Pagoda jetty
 - Marve jetty
- 5 Introduction of small sized buses using CNG within the MGU Notified Area
- 6 Redefining bus routes, designating bus stops and proposing two bus depots - one each for MBMC and MCGM area.

4.3.3 Social Infrastructure and Amenities

- 1 Reservation of land for educational facilities
- 2 Reservation of land for health facilities
- 3 Reservation of land for recreation and play grounds
- 4 Reservation of land for crematoria/ burial grounds
- 5 Reservation of land for fishing related activity
- 6 Reservation of land for tourist amenity and information centers

- 7 Reservation of land for parking lots and bus depots
- 8 Reservation of land for police stations and posts
- 9 Reservation of land for other amenities

4.3.4 Recreation and Tourism

- 1 Facilitating the development of Tourism Development Zone
- 2 Development of the Gorai and Manori beaches with requisite facilities
- 3 Setting up amenities and information centers for tourists at Morva, Gorai jetty, Manori Jetty and Manori
- 4 Development of a mangrove park near Global Pagoda
- 5 Development of mangrove board walk from Gorai Jetty road
- 6 Developing and operating the mangrove boat ride from Gorai jetty
- 7 Operating fish tours (seasonal)
- 8 Designing and developing promotional material for the area
- 9 Organizing special events (annual/monthly)

4.3.5 Environment

- 1 Regeneration and conservation of mangroves in No Development Zone
- 2 Afforestation on the slopes of the three main ridges
- 3 Development of botanical garden and nursery in Gorai-Manori
- 4 Environment compliant development and management of the existing landfill site at Chowk hillcock
- 5 Development of the following water bodies as passive recreational and green spaces
 - Gorai Junction Talav
 - Vairala Lake
 - Uttan Talav
 - Keshav Shrishti Talav
 - Golconda Talav
 - Dongri Talav
 - Morva Talav

4.3.6 Water Supply

- 1 Augmentation and strengthening of the existing water supply system

4.3.7 Sewerage

- 1 Designing a decentralized sewerage system along with treatment plants

4.3.8 Solid Waste Management

- 1 Designing a comprehensive and integrated system to manage the solid waste in a sustainable and efficient manner
- 2 Using segregated bins at all public places and recreational areas
- 3 Sign boards to keep areas clean

4.3.9 Economic Development

- 1 Delineation of Fishing and Allied Activity Zone to promote fishing and related activities
- 2 Allocation of land for cold storage facility, fish processing unit and fish market at Pali
- 3 Promotion of floriculture, vegetable farming, high value added crops and green houses in the Green Zone
- 4 Promotion of home-based fish and vegetable pickling activity

5. Projections and Norms Adopted

5.1 Planning Units

As the MGU Notified area is rural in character and quite unlike an intensely developed city like Mumbai or Mira Bhayander, the villages in the planning area have been treated as 'Planning Units' for provision of social infrastructure and amenities (Map No. 5).

5.2 Population Projections

The plan period of the Development Plan for the MGU Notified Area is considered from 2011 to 2022. Population projections are based on natural growth, however some amount of in-migration on account of tourism activity and opening up of some areas for low density development in Development Zone I has been taken into consideration (refer Table no. 5.2).

5.2.1 Population Projections – Natural Growth

The plan period of the DP for Recreation and Tourism is considered from 2011 to 2022. Population projections were done based on the following:

- Population data was analyzed for the years 1961, 1971, 1981, 1991 and 2001. Population data at this disaggregated level is not yet available for 2011.
- The data across the years was available by different spatial formats – wards, section, villages etc which were not consistent for MCGM and MBMC. Appropriate rationalization was done to get the population for all years by villages in the MGU Notified Area.
- Trends in the annual compound growth rates and shift in the population shares of the MGU Notified Area with respect to larger units – Western Suburbs, MCGM and MMR Region.
- Projections done for MCGM, MMR and Maharashtra by other studies / agencies were taken into consideration.

The following table gives the projected population in MGU Notified Area:

Table No. 5.1: Population Projections on Account of Natural Growth, 2022

Sl. No.	Villages	2001 (Actual)	2011 (Projected)	2022 (Projected)
1	Manori - Gulvem	4,603	5,135	5,717
2	Gorai	4,949	6,191	7,474
3	Utan	15,748	23,142	34,127
4	Pali	2,751	2,872	2,885
5	Chowk	2,751	4,079	6,077
6	Tarodi	1,511	2,705	4,297
7	Dongri	3,526	5,411	8,470
8	Morva	2,080	3,413	5,524
	Total	37,919	52,948	74,571

5.2.2 Population Projections – In Migration

In-migration of Support Population on account of Tourism and Related Activities

This population was estimated on the basis of support staff that would be required to cater to the new hotels/resorts that are expected to come up in the planning area. It is based on the number of staff per room ratio. The existing ratio was studied and an assumption was made for the

proposed hotels/resorts (further categorized by high end, medium end and low end). It was further assumed that 50% of such support staff would stay in the MGU Notified Area.

Table No. 5.2: Projected In-migration on Account of Tourism, 2022

Category	Built-up Area in Ha	Area under rooms (Ha)	Room size in sq. m.	No. of Rooms	Proposed staff/room	Total support Staff
Low-end	42.19 (50%)	21.09 (50%)	30	7,031	0.5	3,516
Medium-end	25.31 (30%)	10.12 (40%)	60	1,687	1.0	1,687
High-end	16.87 (20%)	5.06 (30%)	150	337	2.0	675
Total	84.37	36.28		9,056		5,878

75 ha of land is currently under hotels and resorts. Assuming 80% of the land to be already developed and all the existing facilities to be low-end, the estimated no. of persons employed in tourism based activities is 1,400. Further assuming that 50% of the additional staff will reside in the notified area, the additional population expected to be induced is 9,795 say 10,000 people, considering the average family size to be 5.

This population was considered while designing the capacity of water supply and sewerage systems. It was also considered for estimation of solid waste in the area.

Table no. 5.3: Total Population Projection for the year 2022

Sl. No.	Component	Population
1	Natural Growth	74,571
2	Induced population on account of tourism	10,000
	Total	84,571

The above population projections are considered for computing amenities such as health, education and open spaces; and for designing the capacity of water supply and sewerage.

5.3 Visitors Projections

An important consideration while preparing the development plan was to estimate the number of visitors into the area. This was based on a number of factors – visitors via ferry at present, visitors to Essel World, occupancies in hotels & resorts and proposed special development for recreation and tourism in the area. Table below gives the projected visitors population in MGU Notified Area:

Table No. 5.4: Visitors Projections 2022

S. No.	Type of Tourists	No. of Tourist/day (2006)	No. of Tourist/day (2022)
1	Resident Population in Resorts	275	4,651
2	Floating Population	4,100	6,200
	Total	4,375	10,851

The resident population in the resorts/hotels is based on the area being opened up for development on account of Tourism Development Zone. Estimates are based on the built up area per tourist/visitor considering different categories of hotels/resorts. In case of the floating population an estimate of present day visitor based on visitors via ferry, buses and cars were made and projected using a 3% growth rate.

5.4 Planning Norms Adopted

While preparing the Development Plan for the MGU Notified Area a pragmatic approach was taken to provide the most essential social infrastructure and amenities like education, health & recreational open spaces and adopting appropriate space standards. The standards prescribed in Revised Development Plan of Greater Mumbai (GMDP), Sukthankar Committee of Planning Standards (CPS) and revised standards for Navi Mumbai (NM) were reviewed. Based on the evaluation of the above 3 standards, a set of social and public amenities are proposed for the MGU Notified Area.

Special amenities are proposed in the MGU Notified Area on account of fishing being the major economic activity and the special emphasis on development for recreation and tourism. These are tourism amenity centers and a cold storage cum market area. There were no norms available for these and hence are provided on the basis of schematic designs.

In addition, an important requirement is that of crematoriums / burial grounds. Ample facilities available in the area have been retained and marginally expanded where required.

Table No. 5.5: Amenities and Adopted Norms

No	Public Purpose	Details	Adopted norms for the DP of MGU	Notes/ Remarks
1	Education	Primary School excluding playground	2 sq m/capita @ 10% of total population 1 school /600 pupils	<ul style="list-style-type: none"> A norm of 2 sq m per pupil is adopted from the CPS. Play grounds have been attached but computed as part of recreational open spaces.
		Secondary School excluding playground	2 sq.m/capita @ 10 % of total population 1 school/900 pupils	<ul style="list-style-type: none"> A norm of 2 sq m per pupil is adopted from the CPS. Play grounds have been attached but computed as part of recreational open spaces.
2	Health	Dispensary & Maternity Homes	0.04 sq m/ capita 1/50,000	<ul style="list-style-type: none"> Since there is no consistency across all the three standards, a norm was arrived at on the basis of provisions in all three. As recommended by CPS and NM, a combined facility of a dispensary and maternity home is proposed. The GMDP prescribes 50 beds/100000 and an area of 83 sq. m/bed For MGU: 50 beds for 1,00,000 population in a maternity home is adopted and 1 facility of 25 beds is newly proposed as some facilities are already available. A norm of 80 sq.m/bed is adopted which is close to GMDP norm. This works out to a per capita norm of 0.04 sq m/capita which is prescribed by CPS.
		Hospital	0.05 sqm/ capita 1/1,00,000	<ul style="list-style-type: none"> One facility of hospital is proposed to serve locals & tourists A per capita norm of 0.05 and a 0.5 ha facility for 1,00,000 on the basis of NM norms is adopted. Taking the same norm as 80 sq / bed, there would be about 60 beds.
3	Recreation Open Spaces	All scales of open spaces and, playgrounds	3 sq m/capita	<ul style="list-style-type: none"> Play grounds are provided abutting primary and secondary schools, which may be used by others during non school hours. other recreational spaces have been clubbed with the talavs A per capita norm of 3 sq m on the basis of NM norms is adopted.
4	Fishing Activity	Cold storage facility		<ul style="list-style-type: none"> There are no norms but a need for it is perceived. One major is proposed.
5	Tourism Amenity Centers	Tourism/ Amenity Centers		<ul style="list-style-type: none"> No norms available but area estimated on the basis of schematic design requirements.
6	Crematorium/ burial ground	Crematorium/ burial ground		<ul style="list-style-type: none"> There are no consistent norms in the 3 standards. There are several such facilities in MGU NA. Existing ones are retained and marginally expanded depending on the availability of land

6. Planning Proposals

This section details out all the planning interventions that are required to transform the Notified MGU Area into the envisioned recreational and tourism zone developed in an environmentally sustainable manner. The proposed planning interventions are a mix of regulatory measures, capital investments, policy actions etc. and have been organized under the following 9 components:

- 1 Land Development
- 2 Road Network and Transportation
- 3 Social Infrastructure and Amenities
- 4 Recreation and Tourism Development
- 5 Environment
- 6 Water Supply
- 7 Sewerage
- 8 Solid Waste Management
- 9 Economic Development

In summary, a total of 46 interventions are proposed for the development of the notified area, a list of which is given in Table No.7.5. The proposed interventions are in the nature of policy, regulations and projects. Each of the interventions is described to indicate the rationale/principles, key features and benefits. Wherever relevant, the project costs have been calculated and possible sources of revenue are indicated.

6.1 Land Development

6.1.1 Issues and Opportunities

Majority of the peninsula is under environmental features such as wetlands, vegetation, water bodies, hillocks, rocky out crops and beaches, which lend a unique character to the peninsula, not observed on the mainland, thus creating an opportunity to both conserve and utilize them for recreational purposes.

The settlements along the west coast that constitute the existing developments occupy only 10.94% (4.74 sqkm.) of the total area. The existing uses include residential, commercial, industrial & storage, social amenities, transportation and recreation. Further large scale developments capitalizing on the recreational potential of the peninsula, such as an amusement park (Essel World) and a spiritual institution (Global Pagoda) have also come up. Most of the notified area is under the green zone and no development zone as per the sanctioned Development Plans of Mumbai and Mira Bhayander Municipal Corporations. Also, a substantial proportion of the MGU Notified Area is affected by the Coastal Regulation Zone Notification (CRZ).

There is endogenous demand for land to accommodate the growth and expansion of the village settlements and exogenous demand is seen in the form of weekend homes and farmhouses in the area. Some of the tall buildings are not in harmony with the village settlements with a predominantly 1 or 2 storey built fabric.

Zoning in the sanctioned Development Plans of MCGM and MBMC attempts to preserve the environment by demarcating a large area of the peninsula under no development zones, thereby restricting the supply of land as well as activities that lend to appreciation and preservation of the natural environment. Further the present zoning system demarcates areas by specific land uses such as residential, commercial, industrial, institutional etc. In practice however given the way general development control regulations are framed, mixed development is observed. This causes

problems of nuisance spillover (traffic, parking, pollution, solid waste etc), and results in the neighbourhoods getting characterized by incoherent built form.

The gaothans are an archetype of fishing settlements and the local architecture is influenced by Maratha and Portuguese styles. In the absence of incentives and a dear approach to the conservation of heritage precincts, the gaothans are succumbing to mounting growth pressures in the process destroying the rich historical legacy of the area.

The government is the major land owner in the area, information regarding which is available in sketchy form. In the absence of details in terms of ownership records and maps, it is difficult to use any of these for development leading to a gross under-utilization of the valuable resource - urban land.

6.1.2 Proposals

The following proposals have been framed with a view to optimally utilize the land available for development in the planning area:

- 1 Delineation of land use zones
- 2 Calculation of population holding capacity of the Notified Area
- 3 Delineation of heritage precincts
- 4 Preparation of development control regulations
- 5 Identification and appropriate utilization of government lands in Notified Area

6.1.2.1 Delineation of Land Use Zones (Map No. 22)

Approach

In an attempt to achieve a fine balance between the environment and human activity, zoning has been carried out for the purpose of regulating human activities over space, based on the impact they are likely to have on environment. The notified area has been classified under three broad zones namely:

- Conservation oriented,
- Low development oriented, and
- Development oriented

Uses are permitted in each zone depending on their nuisance value and intensity or impact on the environment.

Principles

- The conservation areas and development areas have been unambiguously defined. Conservation areas like mangroves are to be left undisturbed. Intensive development is anticipated as an extension to the already developed areas and is to be limited or restricted to a few identified pockets in the Notified area rather than being spread all over. The areas other than mangroves and high/medium intensity development zones are to be treated as transition zones where minimal development is permitted. This overarching principle determines the zoning and access strategy.
- Zones are defined from the least intensive use to the most intensive use:
 - The most fragile environmental features comprising of mangroves and creek inlets were first identified. A majority of the saltpans in the north are non-functional at present which necessitated the allocation of an alternative use for the land under salt pans. Since these areas fall under CRZ-I it is proposed to convert them into mangroves which would also screen the Notified Area from the mainland. Since these areas will need preservation and rejuvenation efforts, they have been categorized as 'No Development Zone'

- The Low Development Zones comprise of areas which sustain the local population through activities such as agriculture, fishing and tourism. Two zones have been delineated in this category, 'Green Zone' and 'Fishing & Allied Activities Zone'.
- Development Zones comprise of three zones namely- 'Tourism Development Zone', 'Development Zone-1, and 'Development Zone-2'
- Considering the area's potential for tourism development, an attempt is made to locate special uses pertaining to tourism/recreation that will serve Mumbai and nearby urban areas.
- Zonal boundaries wherever possible are defined by strong natural features or roads. Broad land-use zones are adopted rather than assigning use to each plot.

Features

The following 6 zones are defined and features of each one are described below:

Table No. 6.1(a): Proposed Land Use Zones 2022

Broad Zone	Proposed Zone	Total Area (Ha)	%
A	CONSERVATION ZONE		44.94
	1 No Development Zone (NDZ)	1938.32	44.94
B	LOW DEVELOPMENT ZONES	1463.80	33.93
	2 Green Zone (G)	1435.17	33.27
	3 Fishing & Allied Activities Zone (FA)	28.63	0.66
C	DEVELOPMENT ZONES	785.15	18.320
	4 Tourism Development Zone (TDZ)	308.20	7.14
	5 Development Zone-1 (D1)	200.10	4.64
	6 Development Zone-2 (D2)	276.85	6.42
D	PROPOSED ROADS	126.32	2.93
	TOTAL	4313.59	100.00

The village-wise break-up of the Proposed Land-use Zones is as given below:

Table No. 6.1(b): Planning Unit-wise break-up of Proposed Land Use Zones, 2022

Village/ Planning Unit	Area in Ha							
	D1	TDZ	NDZ	D2	GZ	Road	FA	Total
Manori	19.84	98.72	279.77	36.20	258.16	30.16	18.45	741.29
Gorai	0.00	175.41	607.65	13.09	376.90	37.53	0.00	1210.58
Uttan	167.07	28.96	791.47	73.42	394.28	29.87	5.76	1490.83
Pali	0.00	2.32	2.11	50.70	40.31	3.63	0.31	99.38
Chowk	0.00	2.79	0.65	25.85	153.24	3.75	4.11	190.39
Tarod	0.00	0.00	69.15	17.65	30.17	4.73	0.00	121.70
Dongri	13.19	0.00	76.54	33.29	154.20	13.63	0.00	290.85
Morva	0.00	0.00	110.98	26.66	27.92	3.02	0.00	168.58
Total	200.10	308.20	1938.32	276.85	1435.17	126.32	28.63	4313.59

6.1.2.2 Population Holding Capacity of the Planning Area

As given in section 5.2.2 of Chapter 5, the estimated population of the Notified Area for the year 2022 is 84,571. It is necessary to check the holding capacity of population of the Notified area based on the proposed land-use distribution. D1, D2, TDZ and GZ are the four development zones in the Planning Area with a combined area of 2220.32 Ha.

Table No. 6.1(c): Population Holding Capacity of the Notified Area, 2022

Zone	Area (Ha)	Devel--opable area	Residential area as % of Dev. Area	Max FSI incl. TDR	Average plot size (sq m)	Average Family size	Popula-tion
D1	200.10	60%	60%	0.5	200	5	9,005
D2	276.85	75%	70%	1.0	100	5	72,673
TDZ	308.20	60%	10%	0.3	200	5	1,387
GZ	1435.17	30%	50%	0.2	300	5	7,176
Total	2220.32						90,240

It is evident from the above table that the estimated population of the Notified Area can be well accommodated as per the proposed land-use distribution.

A Conservation Zone

No Development Zone is an ecologically sensitive zone.

I. No Development Zone (NDZ)

The total area under the NDZ which constitutes mangroves, mudflats, salt pans and creek inlets is 1938.32 ha which is 44.94% of the MGU Notified Area.

- Mangroves: The mangroves and mud flats are observed in the intertidal region of the Manori and Vasai/Bassein creeks. They are predominantly found along the eastern edge of the peninsula and are abutted by agricultural lands and hillocks on the west, and Manori Creek on the east. There are mangroves abutting the Vasai/Bassein creek on the northern side of the notified area.
- Salt pans: Salt pans/works are present in the northeastern side of the peninsula and fall in the villages of Uttan, Dongri, Tarodi and Morva. They are abutted by the mangroves in the south, hillocks on the west and agricultural lands on the east.
- Creek inlets: The creek inlets are tidal water channels found predominantly on the eastern side along Manori Creek. On the western side, there is one inlet in Uttan, which goes up to Pali.

Delineation

This zone follows the High Tide Line (as established in the respective CZMPs of MCGM and MBMC).

Existing Character

The mangroves form a lush green buffer between the notified area and the mainland. Avicennia Marina is a prominent species in the notified area. The drying up of mangroves is observed in areas with human activity. Most of the salt works have closed down over the last few years and the land is unutilized. The mangroves and the salt pan lands are dissected by numerous creek inlets from Manori and Vasai creeks. The creek inlets are used for catching crabs and dumping of solid waste in Uttan.

Rationale

The mangroves, salt pans and the creek inlets are perceived as a fragile, interdependent ecosystem that needs to be primarily preserved, restored, along with a limited and sustainable use of the features. The mangroves are crucial for shore stabilization, protection against salinity ingress, housing a wide variety of fauna and supporting the fishing activity. At the same time they have a great scope for tourism. The closure of the salt works necessitates identification of an alternate use for the land. If left as it is, they will increase the salinity of the ground water. They are proposed to be rejuvenated as mangroves so that they can form a contiguous green buffer along the eastern edge of the Notified Area.

Envisioned Character

The zone consisting of the mangroves, creek inlets and the salt pans are foreseen as a natural, green buffer from the mainland. The salt pans are envisioned to be continued and in some instances restored as mangrove plantations. It is envisioned that there may be educative tourist activities such as mangrove parks, mangrove trails/board walks and boat rides through the creeks. These have been sensitively located within the zone while ensuring minimal interference with the natural eco-system. Such activities will help raise awareness regarding the rich ecology of the area and help in its preservation/conservation. Activities permitted in the CRZ I as per the notifications of MoEF issued from time to time, are proposed to be allowed in NDZ.

B Low Development Zone

There are two sub-zones under the natural resource based zone:

2. Green Zone (G)

3. Fishing & Allied Activities Zone (FAA)

2. Green Zone (G)

Green Zone includes cultivated & fallow lands and land under plantations/orchards with a total area of 1435.17 ha and constitutes 33.27% of MGU Notified Area.

Delineation

The zone is demarcated on the basis of existing use of land, natural boundaries as interpreted from the satellite image, high tide line and the alignment of proposed roads in case of Dongri, Gorai and Manori.

Existing Character

This zone includes cultivated and fallow lands with interspersed water bodies. Rice, seasonal vegetables, coconut and some fruits are the major cultivated crops. Some of the agricultural land parcels especially along the Manori – Gorai Road have some commercial activity like small shops and low end rental rooms to cater to the tourists visiting the area. Green zone also includes natural features such as hillocks, beaches and rocky outcrops. Hillocks with lush tree cover that support a wide variety of flora and fauna and offer spectacular view of the sunset and panoramic views of the fields, mangroves and mainland.

Rationale

Cultivation in the NA area is mainly for subsistence purposes. The crop output is low and the output reaches vegetable markets of Mumbai at the most. Given the high value of land and that it must be used efficiently, it is unlikely that this use can be sustained for long and eventually may have to be opened up for development. Hence some amount of development has been permitted in GZ and the road network has been created to enable the transition in future. Natural features such as hillocks, water bodies, beaches and rocky outcrops need to be conserved and guarded from intensive uses. At the same time such features offer tremendous opportunity to appreciate the environment and have potential as tourism/recreation sites. Hence these are classified as Green Zone where some development is permitted. However considering the ecologically sensitive nature of the area, at no point will the development be as intense as seen in Mumbai or Mira Bhayander at present.

Envisioned Character

The agrarian character of this zone is on account of fields with crops, orchards, nurseries, plantations and horticulture with minimal building activity, agro-tourism and home based activity will be retained. High value crops with some amount of processing to ensure higher returns from the use of land will be permitted. The idea is to open up the hillocks and other natural features for some development. The zone is envisioned to be moderately developable with low FSI.

3. Fishing & Allied Activities Zone (FAA)

The total area of the Fishing & Allied Activities Zone is 28.63 ha and it constitutes 0.66% of the MGU Notified Area. It mainly includes the fish drying yards and boat repairing grounds.

Delineation

The existing fish drying yards and boat repairing areas with adequate space for expansion are designated as Fishing & allied Activities Zone. The boundaries of the zone are rationalized along proposed new roads in some cases.

Existing Character

The fish drying grounds are found along the coast with temporary bamboo structures for drying fish.

Rationale

Fish sorting and drying is an important ancillary activity to fishing. It is one of the primary occupations of the people in the area and will continue to be so for quite some time. It is important to provide space for expansion of activities, improved connectivity to the markets along with supporting services such as cold storage facilities in order to retain and encourage fishing as a means of livelihood.

Envisioned Character

The existing use of the fish drying yards is preserved. Pedestrian trails are proposed to pass along these to give the visitors/tourists a glimpse of this activity.

C Development Zones

There are three types of development zones based on the intensity of activities permitted. Most of these are located in proximity to each other in a layered manner along the coast.

4. Tourism Development Zone (TDZ)

5. Development Zone 1 (D1)

6. Development Zone 2 (D2)

4. Tourism Development Zone (TDZ)

The total area under this zone is 308.20 ha and it constitutes 7.14% of the MGU Notified Area. This zone is demarcated in stretches along the western coast of the peninsula, sandwiched between the beach on the west and the proposed 30m wide north-south running road to the east. In all, 8 pockets as described in Table no. 6.2 below have been designated as TDZ.

Delineation

The zone is delineated on the basis of existing resorts and theme parks with additional space for promoting new resorts, recreation and cultural institutions. Two new/green field locations that offer great views and peaceful environment are proposed – one to the southern most end of the MGU Notified Area in the vicinity of Gagangiri Temple for theme park and the other near Vellankinni Church to the west of the proposed road. The boundaries are rationalized and defined along existing and proposed new roads.

Table No. 6.2: Location of Tourism Development Zone

No	Name	Description	Area (Ha)
1	Pali-Chowk	Existing resorts	5.12
2	Uttan	Vellankinni church and surrounding area	29.98
3	Samulai	Adjacent to Samulai knoll	37.04
4	Gorai Beach	Along Gorai beach in Gorai village	125.68
5	Essel World	Essel World and Water Kingdom	51.43
6	Global Pagoda	Global Pagoda and surrounding area	
7	Manori Resorts	Manori beach and along 30m road in Manori village	36.97
8	South Manori	Southern most point of Manori Village, Gagangiri etc.	21.98
Total			308.20

Existing Character

Currently numerous boarding and lodging establishments are observed in pockets along the coast. The Essel World and Global Pagoda are two popular tourist destinations in the area.

Rationale

Existing holiday resorts and restaurants are included in this zone. The aim is to create a continuous belt of establishments providing recreational and a range of tourism services, as well as facilitating activity along the beach and sea. The Gagangiri location is the end point of the peninsula that offers a spectacular view of rocks, sea and the mainland.

Envisioned Character

This zone is envisioned as a linear stretch of low rise (G to G+1), holiday resorts, restaurants and recreational uses opening out on to the beach, and facilitating activity along the beach. It encourages cycling and pedestrian activity, with a mix of shops and street vending. The area adjacent to the Gagangiri temple is envisioned as a passive miniature theme park modeled along the lines of 'Mini Europe'.

1. Development Zone 1 (D1)

The total area of the zone is 200.10 ha and it constitutes 4.64% of MGU Notified Area. It encompasses agricultural areas that are close to existing settlements and developing areas which already show sparse scattered developments and are likely to develop.

Delineation

The zone is delineated using boundaries of natural features as interpreted from the satellite image, rationalizing extents of existing developments and alignments of existing and proposed new roads and pedestrian pathways.

Existing Character

The area proposed under this zone is mostly under agriculture and institutions.

Rationale

This zone is a low intensity zone, proposed to include the existing farmhouses/weekend houses, provide land and regulate the laissez faire development of second houses or "weekend getaways". It is a transition zone between the more intensive developments and Ecological and Natural Resource based zones.

Envisioned Character

It is envisioned as quiet mixed use, medium intensity and low rise (G, G+1) developments with farm houses, commercial and spiritual/research/educational institutes.

2. Development Zone 2 (D2)

The total area of the zone is 276.85 ha and constitutes 6.42% of MGU Notified Area. It includes all the original gaothans of Manori, Gorai, Uttan, Chowk, Dongri, Pali, Tarodi and Morva along with the immediate surrounding area.

Delineation

The zone is delineated based on gaothan boundaries as in the revenue sheets, gaothan expansion as interpreted from satellite imagery and the areas around the gaothans that are likely to undergo development. The boundaries are rationalized along proposed new roads in some cases.

Existing Character

Most of the villages have developed in a linear manner along the coast. All of them are linked by the Manori-Gorai road. The coastal settlements are mainly fishing settlements and the two inner settlements namely Morva and Dongri are agrarian in character. The settlement pattern is very compact with narrow streets opening into squares/open spaces. The streets in most cases lead

towards the coast. Most of them are old Portuguese settlements and have many heritage structures. The settlement consists of residential buildings with very few mixed uses with the exception of Uttan where a lot of transition to mixed use along the main road has taken place. Most of the structures are compact and single storeyed.

The Gaothan expansion area has sparse structures in scattered clusters. The development around Uttan, however, is quite dense. Some of the structures have mixed use with small shops, commercial and government offices, and social amenities.

Rationale

The rationale behind delineating D2 zone is twofold: 1) To preserve the special character of gaothans and ensure that the new development or redevelopment of the old structures in the gaothans conforms to the overall existing development pattern, and 2) to accommodate the expanding gaothans and the spur of new developments on account of the tourism activity. The idea is to preserve their existing built form, scale and character (mix of uses), undertake conservation measures and at the same time provide an opportunity to better plan out the settlement expansion areas with adequate amenities.

Envisioned Character

The vision is to retain and promote the existing organic character and architecture of the settlement, as well as to allow for change of uses to respond to the economic environment. Extension of gaothans and development of surrounding areas are conceived to have mixed use with G to G+2 / stilt+3 storeyed structures.

6.1.2.3 Delineation of Heritage Precincts (Map No. 22)

Approach

Some of the structures in MGU Notified area are historically important and have rich built heritage and cultural importance. The historically significant structures are important and if conserved and developed appropriately, can become places of tourist attraction.

In the recent times, the Global Pagoda which houses the relics of the Buddha has the distinction of being the largest un-supported dome in the world has already become an important landmark. Development around the Pagoda will have to be regulated so as to resolutely ensure its visibility and sanctity and at the same time efficiently manage the movement of large volume of people.

In order to make the precincts attractive, both regulatory measures as well as capital investments are required followed by measures to promote them as tourist destination.

For a start it is important to spatially demarcate them and make them a part of the Development Plan. This will prevent their incongruent redevelopment and wanton destruction. Further it will provide the requisite regulatory framework to ensure that projects for their improvement and upkeep by various agencies can be effectively enforced.

Principles

- In order to preserve the special character of the gaothans and ensure that the new development or redevelopment of the existing structures conforms to and is harmonious with the overall development pattern, all the gaothans have been zoned under Development Zone 2.
- Those gaothans that merit greater measures as 'heritage precinct' are delineated in the Development Zone 2 which indicates that in addition to the applicable development control regulations of the zone, special guidelines and regulations will govern the development.
- In case of the Global Pagoda it is important to delineate not only a precinct around it but also a buffer zone abutting the precinct to regulate the nature of development.

Features

- The heritage precincts are proposed for the village settlements of Manori, Gorai, Culvem, Dongri and an area around the Global Pagoda
- The boundary of the heritage precinct for Manori, Gorai and Culvem is delineated on basis of the gaathan boundary in the revenue sheets. In case of the Global Pagoda a 100 m buffer zone is delineated around the Precinct.
- Special Development Control Regulations for heritage buildings and precincts are applicable irrespective of the land-use zones.

Table No. 63: List of Heritage Precincts

No.	Heritage Precincts	Area (Ha)
1	Manori Gaathan	11.94
2	Culvem Gaathan	2.77
3	Gorai Gaathan	4.65
4	Dongri Gaathan	4.77
5	Global Pagoda	15.24
	Total	39.37

6.1.2.4 Development Control Regulations

Approach

Land-use zones have been delineated to preserve and enhance the character of conservation areas and to ensure that new developments are in harmony with the existing built fabric and environment. The Development Control Regulations have been framed for these zones in order to ensure the same. It is also proposed to regulate development by controlling the density, built form character and nuisances generated by uses rather than regulating plot-level uses.

Principles

- Simple, clear and optimal so as to avoid issues of misinterpretation, speed up the process of approval and make implementation easier.
- Zone based activities rather than plot based uses.

Features

- The summary list of uses permitted in each zone and the planning regulations for the proposed zones are shown in Table no. 6.4.
- The detailed regulations pertaining to procedures, planning and building design are contained in a separate report on Development Control Regulations.

Table No. 6.4: Summary of Development Control Regulations (DCRs) for Proposed Land-Use Zones

Permissible Uses Broad Land-Use Zone		Maximum Permissible Base FSI	Maximum No. of Storeys Permissible	Conservation and restoration	Nature Tourism	Recreation	Agriculture and Plantation	Fishing Related	Residential	Home-based Economic Activities	Commercial	Institutional	Hospitality & Entertainment	Special Commercial	Utilities
1	No Development Zone	As permitted in CRZI		√	√										
2	Green Zone	0.10**	G+1	√	√	√	√		√	√	√	√	√		√
3	Fishing & Allied Activities Zone	0.10	G					√							√
4	Development Zone I	0.30***	G+1						√	√	√	√		√	√
5	Tourism Development Zone	0.30	G+1			√			√	√	√	√	√	√	√
6	Development Zone 2	1.00	G+2					√	√	√	√	√		√	√

* Note: The table indicates general maximum permissible FSI for all categories, subject to provisions of the CRZ regulations.

** General Maximum Permissible FSI in Green Zone is 0.10; Maximum Permissible FSI with TDR/on payment of premium is 0.20; subject to provisions of the CRZ regulations.

*** General Maximum Permissible FSI in Development Zone-I is 0.30; Maximum Permissible FSI with TDR/on payment of premium is 0.50; subject to provisions of the CRZ regulations.

Table No. 6.5: List of Permitted Uses in various Land-Use Zones

No	Activity	Description
1	Conservation and Restoration	<ul style="list-style-type: none"> • Restoration Activity: Restoration of the ecological feature to its natural condition, where depleted. For example, in the case of mangroves/mud flats, it involves planting of new mangroves and maintenance of existing mangroves; for hillocks it involves planting of local vegetation species; for salt pans it involves restoring them to mangroves and for creek inlets it's maintaining the water way
2	Nature Tourism	<ul style="list-style-type: none"> • Mangrove board walk and a boat ride and is a supervised activity for educational purpose only
3	Agricultural and Plantation	<ul style="list-style-type: none"> • Cultivation of crops, plantations, horticulture, floriculture, vegetables etc. • It also includes green houses, nurseries and some amount of processing facilities for processing the agricultural / plantation produce.
4	Recreation	<ul style="list-style-type: none"> • Designated trekking / walking trails • Fishing, Boating and Water sports • Rock climbing, sway rope, rope-bridge, paragliding, horse riding and joy rides along with some amount of facilities to the service providers • Camping sites: Day camps, children's and adult's nature camps. These include temporary camp structures (tents), temporary tree houses and amenities such as rest rooms, store room, cooking areas and an administrative area. • Picnic spots: This includes pavilions with roof and open on sides, open seating areas, viewing gallery/plinth with railing/parapets with viewing station and amenities such as rest rooms, water fountains, and mobile vendors.
5	Fishing Related	<ul style="list-style-type: none"> • Fish sorting, drying, boat building, boat repair and net repair. • Temporary structures and platforms to dry fish and store equipment in case of repair activities. • Structures for allied activities for promotion of fishing.
6	Residential	<ul style="list-style-type: none"> • Residential buildings that are a) detached or semi-detached floor like farm houses, bungalows in Green Zone b) detached, semi-detached houses such as independent houses, twin houses, row houses, walk-ups and apartments in Development Zones
7	Home-based Economic	<ul style="list-style-type: none"> • Economic activity based in homes, which does not cause nuisance to the neighbours, and does not involve intensive mechanical equipment or machinery. • Offices of professionals such as lawyers, accountants etc.
8	Commercial	<ul style="list-style-type: none"> • Shops providing essential day to day goods and services to households such as groceries. • Establishments such as banks, petrol pumps, shopping centres, cinema theatres etc. • Lodging & boarding houses.
9	Institutions	<ul style="list-style-type: none"> • Social and welfare institutions such as, crèches, places of worship, old age homes, libraries etc. • Cultural institutions such as community halls, function halls, auditoria etc. • Utility institutions such as post offices, police stations etc • Health and medical institutions such as clinics, dispensaries, maternity homes and hospitals. • Educational institutions such as schools, colleges, university, vocational training centres, research centres etc.
10	Hospitality and entertainment	<ul style="list-style-type: none"> • Establishments such as resorts, hotels, lodging & boarding houses. • Theme parks, amusement parks, wellness centres. • Film studios and film & video shooting sites.
11	Special Comm	<ul style="list-style-type: none"> • Shopping complexes and malls
12	Utilities	<ul style="list-style-type: none"> • Open spaces, power lines, gas lines, water supply lines & treatment facilities, sewage lines & treatment facilities, electric sub stations, fire stations, burial grounds/ crematoria, bus stops/depots, amenity centres, public toilets etc.

6.1.2.5 Identification and Appropriate Utilization of Government Lands in the Notified Area

Approach

The government owns about 2,300 Ha of land which constitutes 52% of the total MGU Notified Area. Out of this, 115 Ha is leased out to the MTDC and about 349 Ha is under “No Development Zone” in the prevalent development plans for Mumbai and Mira Bhayander. The rest is under various uses such as gurdharan, malas, roads, play grounds and such others.

The government thus is a major stakeholder in the area. The government land holdings are large and contiguous. Hence they can set a precedent to guide future development in the MGU Notified Area thus a) facilitating development of some of the recreational/tourism projects that are identified and b) help in meeting some of the requirements for the social amenities.

A preliminary identification of lands has been done as a part of the studies and analysis which helps in locating some of the amenities and special projects for tourism and recreation. However there are many hissas or subdivisions under government ownership for which areas are available but maps are not available. A strategy for utilization of Government lands can be made based on the available data.

Features

Two proposals have been made in the plan for utilizing the Govt. lands appropriately, namely:

- a) About 50% of the reservation areas are placed over the lands owned by the Government, thereby reducing the hardship to private land owners and ensuring quick development of such reservations in the first phase.
- b) A portion of the Government land can be leased by the Planning Authority to raise revenue for financing the infrastructure. Calculations made in this regard are placed in Table no. 7.5.

However, the precondition for appropriate utilization of the Government lands is for the Government to transfer such lands or a portion of the same to the Planning Authority at no cost.

6.2 Road Network and Transportation

6.2.1 Issues and Opportunities

MGU Notified Area is a peninsular land mass jutting into the Arabian Sea on the western side of Mumbai. This peninsula to an extent is disconnected from the main land due to its setting – it has the Vasai creek in the north and the Manori creek in east separating the peninsula from the main land mass. It is attached to main land mass only on the north east side.

The peninsula itself has significant topographical variations with large areas under mangroves, cliffs, ridges, knolls, flat agricultural land and beaches. Due to these topographical variations, the settlements in the area have developed at the most conducive locations – mostly along the coast and in the plains. All these factors have led to the development of the existing road network pattern within the area. Presently the area is accessed via road from Mira Bhayander. This is the only road that runs from north to south providing connectivity to various settlements. Other roads bifurcate from this main spine at three points/nodes to provide access to the settlements and areas away from the main road/main spine.

Most of the settlements in the area have developed along the coast and the connecting road network in a linear fashion has its own narrow network of streets and lanes for internal movement and to access the fields and the beaches. Another mode through which the area is accessed presently is the ferries. There are two points, Borivali jetty and Marve beach from where ferry can be taken to access the area. Presently there is no direct road connectivity from Mumbai, except the

Manori-Bhayander route. This causes difficulty for the local residents to access Mumbai in case of medical emergency services. The residents have to depend on the ferry services for travel to Mumbai for emergency services. This also makes it difficult for the MCGM and MBMC to provide services, especially solid waste management.

A large number of tourists from Mumbai daily visit Essel World and Global Pagoda by road and further add on to the volume of vehicles on the Manori-Bhayander route. As there is no alternative route, this road becomes the lifeline of the area. It is a cause of concern – in case of any emergency or any other natural or manmade disasters this spine is the only entry and exit point. This being the only road link, high traffic flow results into congestion clearly evident when it passes through the compact village settlements.

There is no clear hierarchy in the road network. Roads branch off from the main spine leading to various areas. Most of these roads are dead ends. There are no alternative routes to reach an area. The access to the coastal areas and many other places of interest is limited, in case of an increased tourist activity it will have to be improved. The existing jetties are not so well developed in terms of facilities, they are mere access points and the ferries plying are low end which make the experience difficult and dismal.

However considering the growth of resident population as well as the large tourist population expected in the coming decade, it is necessary to connect the notified area to Greater Mumbai across Manori Creek. Therefore, the two bridges at Gorai and Manori proposed in the Development Plan of Greater Mumbai are proposed to be retained in the plan. On priority, the bridge at Manori is proposed to be taken up first as it is the closest to Mumbai. The new network will have to balance the objective of increasing connectivity as well providing it in a manner that does not make the entire area accessible so as to protect the ecological areas.

To address the above concerns, a new road network plan with appropriate hierarchy is proposed with new links, road widening of existing links, junction improvements and parking lots. With the opening of new areas for development and to ensure efficient access by public transport, new bus routes are worked out along with a transfer point/depot. To encourage people into the area via ferries, it is proposed to upgrade the existing jetties and ferry services and provide new jetties at Marve Beach and Global Pagoda.

6.2.2 Proposals

- 1 Preparation of a structure plan for road network and transportation
 - New links
 - Road widening
 - Junction improvements
 - Pedestrian trails / hiking trails
 - Parking provisions
 - Bus depots
- 2 Guidelines for designing roads and pedestrian trails
- 3 Refurbishment of the existing jetties and developing facilities around them:
 - Manori jetty
 - Gorai jetty
 - Essel World jetty
 - Borivali jetty
- 4 Building new jetties at the following locations and developing facilities around them:
 - Global Pagoda jetty
 - Marve jetty

- 5 Introduction of small sized buses using CNG within the MGU Notified Area
- 6 Redefining the bus routes, designating bus stops and bus depot

6.2.2.1 Preparation of a Structure Plan for Road Network and Transportation (Map No. 23):

- New links
- Road widening
- Junction improvements
- Pedestrian trails / hiking trails
- Parking Provisions

Approach

The objective is to manage the relationship between the environment and intensity of human activity – managing the human-environment interaction over space. This determines the access strategy for the MGU Notified Area. Most of the area is dominated by the environmental features and the development is concentrated in a few pockets – settlements along the coast and along the north south access road.

It is proposed as a strategy to confine the development to where it is, plan new growth areas as an extension to the developed areas. As a conscious decision, it is proposed not to make the ecological areas easily accessible (by providing direct motorable roads). New areas that are being opened up for special recreational activities are to be given access in a sensitive manner via pedestrian trails. At the same time the settlements and new development will need better access. It is proposed to address this through the road network pattern and improving the quality of access. Better access does not imply a direct road connection but efficiency of getting to/reaching a place. If along the way the experience is richer then it is a much better solution.

Principles

- Conservation/preservation areas and developable areas are unambiguously defined.
- A clear hierarchy of network has been proposed in the developable areas to give adequate and efficient access. Lower order roads meet higher order roads.
- In case of areas of tourist interest in Green Zone, minimal, indirect and as far as possible pedestrian access is provided.
- The coast is made more accessible.
- A network pattern of loop roads branching from the main spine is attempted as far as possible which provides alternate routes.
- The roads follow the contours or respond to the topography and meander to provide a better visual experience of the area.
- Roads are realigned where they pass through the village settlements with significant heritage structures to avoid bottlenecks.
- As much as possible the alignment of the new roads/links and widening of existing roads has been taken through government property/plots to reduce the burden of the plan implementation.

Features

- A comprehensive road network plan has been articulated consisting of⁴:

⁴ All the proposals have been given numbers, which are used as reference in the tables and shown on a larger version of Map No. 23 given separately. The numbering system is as follows:

- All the junctions were named. Junctions which are well known and have names are retained and all others are numbered as J1, J2, J3 etc continuously from south to north. These are indicated in black colour on the map.
- All new links were numbered as N1, N2, N3 etc continuously from south to north. These are indicated in brown colour on the map.

- New roads/links
- Road widening
- Junction improvements
- Parking provisions
- Pedestrian trails
- The following road hierarchy is proposed:
 - 30.0 m
 - 20.0 m
 - 18.3 m
 - 12.0 m
 - 09.0 m
 - Pedestrian trails (3.0 m wide)
- All roads to be developed for the full right of way.
- 60 new links proposed.

Table No. 6.6: List of Proposed New Road Links

No	Road No.	Village / Planning Unit	Name of Link	Proposed Width (m)	Approx. Length (m)	Area (Ha)
1	N1	Manori	link from J1 to J2	9	1,121	1.01
2	N2	Manori	link from J2 to J3 around Gagangiri Temple	9	2,070	1.86
3	N3	Manori	link from J2 to J3	9	210	0.19
4	N4	Manori	link from J5 to J6	9	369	0.33
5	N5	Manori	link from Link no. 6 to Manori Fishing Beach	9	134	0.12
6	N6	Manori	link from J15 to J72 Sumlai Talav	9	3,261	2.93
7	N7	Manori	link from J8 to J71	30	1768	5.30
8	N8	Manori	link from J12 to link no. N7	9	340	0.31
9	N9	Manori	link from J9 to J18	9	3,350	3.02
10	N10	Manori	link between link no. N9 in Manori Gaothan	9	238	0.21
11	N11	Manori	link from J10 to link no. N9	9	232	0.21
12	N12	Manori	link from J11 to link no. N9	9	212	0.19
13	N13	Manori	link from J12 to link no. N9	9	153	0.14
14	N14	Manori	link from J13 to link no. N9	9	170	0.15
15	N15	Manori	link from J14 to link no. N9	9	245	0.22
16	N16	Manori	link from J17 to link no. N9	9	220	0.20
17	N17	Manori, Gorai	link from J19 to Gorai Fishing Jetty	9	1,207	1.09
18	N18	Manori	link from J21 to link no. N17	9	140	0.13
19	N19	Manori	link from J22 to link no. N17	9	251	0.23
20	N21	Gorai	link from J25 to Global Pagoda Jetty	18.3	1,819	3.33
21	N23	Gorai	link from J23 to J27	9	601	0.54
22	N24	Gorai	link from J27 to J36	12	3,124	3.75

- All road widening are numbered as 1, 2, 3 etc continuously according to the road hierarchy, from south to north. All numbers are indicated in magenta colour on the map.
- Junction improvements have been indicated with a red colour circle and an alphabet, for e.g. A, B etc.

No	Road No.	Village / Planning Unit	Name of Link	Proposed Width (m)	Approx. Length (m)	Area (Ha)
23	N25	Gorai	link from J28 to J34	9	1,757	1.58
24	N26	Gorai	link from J29 to Link no. N24	9	160	0.14
25	N27	Gorai	link from J30 to Link no. N24	9	200	0.18
26	N28	Gorai	link from J31 to Link no. N24	9	112	0.10
27	N29	Gorai	link from J32 to Link no. N24	9	133	0.12
28	N30	Gorai	link from J33 to Link no. N24	9	150	0.14
29	N31	Gorai, Uttan	link from J24 to Link no N48	12	3,054	3.66
30	N32	Gorai, Uttan	link from J35 to J39	12	1,217	1.46
31	N33	Uttan, Pali	link from J44 to J58	12	2,684	3.22
32	N34	Uttan	link from J43 to J46	9	389	0.35
33	N35	Uttan	link from J48 to Uttan Fishing Beach	9	85	0.08
34	N36	Uttan	link from J49 to Uttan Fishing Beach	9	130	0.12
35	N37	Uttan	link from J50 to Uttan Fishing Beach	9	296	0.27
36	N38	Uttan	link from J51 to Link no. 19	9	64	0.06
37	N39	Pali	link from J52 to Link no. 19	9	152	0.14
38	N40	Pali	link from J53 to Pali Fishing Beach	9	68	0.06
39	N41	Pali	link from J54 to Pali Fishing Beach	9	54	0.05
40	N42	Pali	link from J55 to Pali Fishing Beach	9	66	0.06
41	N43	Pali	link from J56 to Pali Fishing Beach	9	320	0.29
42	N44	Pali	link from J57 to Pali Fishing Beach	9	61	0.05
43	N45	Chowk	link from J59 to J60	12	704	0.84
44	N46	Dongri, Tarodi	link from J69 to J76	30	1,571	4.71
45	N47	Dongri, Uttan	Enclosed Loop at J64	12	5,236	6.28
46	N48	Uttan	link from J38 to Link no. NB1 near J7	9	1,037	0.93
47	N49	Uttan	link from J66 to Link no. N48	12	1,802	2.16
48	N50	Dongri, Uttan	link from J66 to J67 south forming loop at the end near Link no. N47	12	2,711	3.25
49	N51	Morva	link at J68	9	1,460	1.31
50	N52	Uttan	link from J64 to Link No 48	9	792	0.71
51	N53	Uttan	link from J65 to Link No 48	9	1,061	0.95
52	N54	Gorai	link between J74 to J75	9	1,766	1.59
53	N55	Gorai	link starting from J73	9	568	0.51
54	N56	Pali, Uttan	link from N33 near J58 to link no 24 near J46	9	1,950	1.76
55	N57	Pali	link from N33 to link N56	9	270	0.24
56	N58	Pali, Uttan	link from N33 near J51 to Reservation no. 63	9	363	0.33
57	N59	Uttan	link from Uttan Dhavgi Road to Link no 18 near Bhoot Bangla	9	838	0.75
58	N60	Uttan	link from N33 near J45 to link No. 9 near Junction C	9	868	0.78
50	N61	Gorai	link near Gorai Junction access road to	9	137	0.12

No	Road No.	Village / Planning Unit	Name of Link	Proposed Width (m)	Approx. Length (m)	Area (Ha)
			reservation no. 86			
60	N62	Manori	Link near link no R2 access road to reservation no. 87,88,89	9	241	0.22
Total					55,862	65.05

- 24 roads are proposed to be widened:

Table No. 6.7: List of Roads to be widened

Road No.	Village	Road Name	Existing Width (m)	Proposed Width (m)	Approx. Length (m)	Total area (Ha)	Add. area (Ha)
1	Manori, Culvem, Gorai	Road from J1 to J8	9.0	30	1,400	4.20	2.94
		Road from J8 to J1	3.5	9	1,814	1.63	1.00
		Road from J1 to J20	9.0	30	1,103	3.31	2.32
		Road from J20 to Gorai Junction	9.0	30	1,141	3.42	2.40
		Road from Gorai Junction to J37	9.0	30	2,739	8.22	5.75
2	Gorai	Road from Gorai Junction to Gorai Jetty	9.0	20	3,741	7.48	4.12
3	Manori	Road from J20 to J22	3.5	9	484	0.44	0.27
4	Gorai	Road from J26 to J27	3.5	12	382	0.46	0.32
5	Manori	Road from J7 to OL of Perpetual Succor Church	3.5	9	345	0.31	0.19
6	Manori	Road from J1 to J4	3.5	9	606	0.55	0.33
7	Manori	Road from J3 to Gagan giri Temple	3.5	9	230	0.21	0.13
8	Uttan, Dongri	Road from J37 to J76	9.0	30	2,690	8.07	5.65
9	Dongri	Road from J62 to Dongri Junction J69	3.5	12	674	0.81	0.57
10	Dongri, Tarodi, Raimurdhe	Road from Dongri Junction to J67	9.0	30	340	1.02	0.71
11	Morva, Raimurdhe	Road from J67 to Morva Village Boundary	9.0	30	1,503	4.51	3.16
12	Uttan	Road from J39 to J41 to J40 to J39	3.5	9	1,287	1.16	0.71
13	Uttan	Road from J40 to J44	3.5	12	793	0.95	0.67
14	Uttan	Road from J41 to J47	3.5	9	1,290	1.16	0.71
15	Uttan	Road from Link no. 15 to Light House	3.5	9	185	0.17	0.10
16	Uttan	Road from J42 to J44	3.5	9	463	0.42	0.25
17	Uttan	Road From Bhut Bangla Junction to J45	5.0	12	869	1.04	0.74
18	Uttan, Pali	Road from J45 to J58	3.5	9	2,567	2.31	1.41
19	Pali, Chowk	Road from J58 to J59	3.5	12	733	0.88	0.62
20	Chowk	Road from J59 to Chowk Bus Stand	3.5	9	908	0.82	0.50
21	Chowk, Tarodi, Dongri	Road from J60 to J62	3.5	12	2,200	2.64	1.87

Road No.	Village	Road Name	Existing Width (m)	Proposed Width (m)	Approx. Length (m)	Total area (Ha)	Addl. area (Ha)
22	Uttan	New (R3)	3.5	12	1,028	1.23	0.87
23	Uttan, Dongri	Road from J76 to J63	3.5	12	915	1.10	0.78
24	Uttan, Dongri	Road from dumping ground to N33 near J46 & J64	3.5	9	2,937	2.64	1.62
Total					35,367	61.15	40.71

While the area of widened existing roads is 61.15 ha, the additional area required to be acquired for such widening is 40.71 ha

- 5 junction improvements are proposed:

Table No. 6.8: List of Junction Improvements

No.	Location
A	Junctions J6 and J7 (taken together as are in close proximity)
B	Gorai Junction
C	Bhut Bangla Junction
D	Junction J2
E	Junction J

- 21 pedestrian/hiking trails of 2.0 m width are proposed to provide access to camping sites, picnic & viewing spots:

Table No. 6.9: List of Pedestrian Trails

No.	Trail No.	Village	Pedestrian Trails	Prop. Width (m)	Approx. Length (m)	Area (Ha)
1	P1	Manori	Pedestrian Link between Link no. N2	3.00	624	0.19
2	P2	Manori	Pedestrian Link from link no. N9 to Link no. 1	3.00	815	0.24
3	P3	Manori	Pedestrian Link from link no. N9 to Link no. 1	3.00	402	0.12
4	P4	Manori	Pedestrian Link from link no. N9 to Link no. 1	3.00	628	0.19
5	P5	Manori, Gorai	Pedestrian Link from link no. N19 to Link no. 1 near Gorai Junction	3.00	777	0.23
6	P6	Gorai	Pedestrian Link from link no. 1 near J28 to link no. N24 near J35	3.00	1,993	0.60
7	P7	Gorai	Pedestrian Link Between link no. N31 and N48	3.00	2,026	0.61
8	P8	Gorai, Uttan	Pedestrian Link from link no. N24 near J35 to Link no. 1 near J36	3.00	2,034	0.61
9	P9	Uttan	Pedestrian Link from link no. N32 to Link no. P8	3.00	305	0.09
10	P10	Uttan	Pedestrian Link from link no. 13 to Link no. 5	3.00	665	0.20
11	P11	Dongri	Pedestrian Link from Dongri Settlement to J64	3.00	2,399	0.72
12	P12	Uttan, Pali	Pedestrian Link from link no. N35 to Link no. N44	3.00	1,691	0.51
13	P13	Chowk	Pedestrian Link at Chowk hillcock	3.00	518	0.16
14	P14	Chowk, Pali, Uttan	Pedestrian Link from link no. P13 to link no. 24	3.00	2,241	0.67
15	P15	Pali	Pedestrian Link from link no. 20 near J58 to Link no. P14	3.00	626	0.19
16	P16	Chowk, Pali	Pedestrian Link from link no. P13 to Link no. P14	3.00	1,385	0.42
17	P17	Chowk	Pedestrian Link from link no. P13 to Chowk Bus Stand	3.00	645	0.19
18	P18	Chowk	Pedestrian Link from Chowk Bus Stand to Link no. 22	3.00	185	0.06
19	P19	Chowk	Pedestrian Link from link no. 20 to Link no. N45	3.00	693	0.21
20	P20	Uttan	Pedestrian Link from J52 to Link no. N48 & N53	3.00	926	0.28
21	P21	Uttan	Pedestrian Link from J5 to J39 on N32	3.00	852	0.26
Total					22,430	6.47

- 5 parking lots are proposed for visitors in the notified area :

Table No. 6.10: List of Proposed Parking Lots

No.	Parking lots	Planning Unit	Reservation No.	Proposed Area (sq m)	Parking Capacity*
1	Near Gorai junction	Gorai	36	4,170	Cars – 75 Two wheeler – 50 Rickshaws – 50 Bus – 20
2	At J36 in Gorai	Gorai	72	11,067	Cars - 240 Two wheeler – 80 Rickshaws – 60 Bus - 56
3	At J13 near Manori – Gorai Road	Manori	48	4,030	Cars - 100 Two wheeler – 60 Rickshaws – 40 Bus - 10
4	Near Link N21, Essel World	Gorai	66	4,021	Cars – 90 Two wheeler – 50 Rickshaws – 30 Bus - 16
5	Near Link N21, Essel World	Gorai	67	5,670	Cars – 45 Bus – 65
Total				28,958	

* 40% of the area calculated towards circulation, 15 sq m/car, 3.5 sq m/two wheeler and 7 sq m/rickshaw and 42 sq m/bus

- 2 Bus depots / transfer points for buses plying in the area are proposed :

Table No. 6.11: List of Proposed Bus Depots

No.	Bus Depot	Planning Unit	Reservation No.	Proposed Area (sq m)
1	Gorai	Gorai	34	11,970
2	Uttan	Uttan	73	11,682
Total				23,652

Costs

There will be two costs involved – cost of land acquisition and cost of development. Cost of development includes paving, street furniture, landscaping, street lighting and plantation. It also includes the cost of detailed topographical survey. Land acquisition areas are arrived at after deducting the alignments of the proposed road network over the government lands. All cost estimates are schematic for the purpose of arriving at the overall block costs and will have to be refined as the works are taken up for implementation and more detailed studies are carried out. A summary table below gives the development costs for the components excluding Parking Lots and Bus depots, as the same are considered under Reservations at section 6.2.3.7.

Table No. 6.12: Estimated Cost of Road Network and Transportation

No.	Description	Area (Ha.)	Costs (Rs. Cr.)
I	Land acquisition costs		
A	New links @ Rs. 4,150 / sq m @ 67% being private land*	43.44	180.28
B	Road widening @ Rs. 4,150 / sq m @ 67% being private land* (@ 36.31 ha. of addl area)	24.20	100.45
C	Junction improvements (part of A and B)	NA	0
D	Pedestrian trails @ Rs. 4,150 / sq m @ 67% being private land*	4.34	18.00
Sub Total		74.50	309.18

No.	Description	Area (Ha.)	Costs (Rs. Cr.)
2	Development costs		
A	Newlinks @ Rs. 6000 / sq m of road**	65.17	391.01
B	Road widening (@ Rs. 6000 / sq m** of 36.31 ha. of addl area + Rs. 3000/sq m of 24.84 ha. of existing road width)	61.15	219.75
C	Junction improvements (part of A and B) @ Rs. 1000/sq m if addl. cost	1.58	1.58
D	Pedestrian trails @ Rs. 2500 / sq m	6.47	16.18
	Sub Total ***	134.37	628.53
	Total		937.70

*Based on a rough estimate, 67% of the land under proposed new roads, road widening and pedestrian trails is under private ownership. Although the rates vary across villages in the Ready Reckoner 2011, an averaged out rate is considered.

** The rate includes cost of topographical survey and development of the entire right of way – medians, carriageway, foot paths, cycle lanes and street furniture.

*** Costs related to parking lots and bus depots are not included in this table. They are considered as public reservations and are therefore dealt with in section 6.3.2.7

6.2.2.2 Guidelines for Designing Roads and Pedestrian Trails

Approach

Streets carry multiple types of traffic, pedestrians and often are home to several activities. These have to be organized well in-order to avoid congestion, conflicts due to multiple uses etc. For this the full right of way must be designed to organize the activities.

The MGU Notified Area is specially being developed for recreation and tourism activities and roads/streets are very important from the view point of the experience they offer to the visitors. They should be pedestrian friendly and have amenities along the way, break into places to sit and enjoy the views etc. The pedestrians must always have a greater right on the road / street space.

Also the MGU Notified Area is ecologically sensitive and the design of roads/streets cannot be treated at par with urban roads in highly developed cities like Mumbai. In the MGU Notified Area the design criteria are different – here the traffic should not be able to move at full speed, there must be adequate signage to guide tourists, street furniture and streets must be for people and not vehicles.

Principles

- Section design to respond to the surroundings – built-up, beaches, mangroves etc
- Greater space allocation for pedestrians
- Use of material that is harmonious with the surroundings, slows traffic

Features

The road / street design would have the following components and these would vary depending on the adjoining uses / zones:

1. Carriage Way
2. Median
3. Footpaths
4. Bicycle Lanes
5. Street Lights
6. Trees, plantation barriers
7. On Street Parking
8. Street furniture – street furniture, dustbins, railings/green barriers, tree pits etc
9. Bus Stops
10. Kiosks

6.2.2.3 Refurbishment of the Existing Jetties and Developing Facilities around them (Map No. 24):

- Manori Jetty
- Gorai Jetty
- Essel World Jetty
- Borivali Jetty

Approach

There are three ferry connections operational: 1) Marve – Manori (run by MCGM), 2) Borivali – Gorai (run by Machimaar Society) and 3) Essel World (run by Essel World) to Manori & Gorai. These serve the purpose of communication efficiently but are not of a high quality.

It is proposed to upgrade these jetties, run better quality of ferries which can take pedestrians and two wheelers. Along with this, appropriate facilities for tourists such as waiting areas, information center which can display events / attractions of the area, maps etc., rest rooms, refreshments areas and ticketing counters are proposed.

Although there will a bridge between Marve and Manori jetties, it is proposed to retain the ferry connection as it will continue to serve the locals and tourists who will eventually prefer the more scenic ferry route.

Principles

- Jetty and facility design to respond to the surroundings.
- Greater space allocation for pedestrians
- Use of material that is harmonious with the surroundings, slows traffic

Features

- Refurbish the Manori, Gorai and Borivali jetties with RCC, railings, paving etc.
- Develop amenity areas next to the Manori and Gorai jetties to accommodate the following:
 - Ticketing counter
 - Information kiosk / center
 - Rest rooms
 - Refreshment areas
 - Waiting area
 - Limited parking for two wheelers and cars and autos
- Detailed engineering designs and plans will have to be prepared integrating the jetties and the amenity centers
- Construction / refurbishment of jetties can be taken up by the Mumbai Maritime Board (MMB).

Costs

The costs of upgrading the jetty are approximately estimated. The cost of amenity centers along with these is estimated in Section 6.3.

Table No. 6.13: Estimated Cost of Upgrading Jetties

No	Description	Costs (Rs. Cr.)
1	Manori Jetty : Refurbishing of 400 sq m area of @ Rs. 2300/sq m* (length 58m x width 8m = 400sq m)	0.09
3	Gorai Jetty : Refurbishing of 880 sq m area of @ Rs. 2300/sq m (length 110m x width 8m = 880sq m)	0.20
2	Borivali Jetty : Refurbishing of 1752 sq m area of @ Rs. 2300/sq m (length 219m x width 8m = 1752sq m)	0.40
	Total	0.69

* estimated

Revenue

Possible revenue sources:

- Higher ticket charge to be levied on tourists which becomes a tourism entry fee. In case the tourist is entering with a private vehicle, the fee could be higher.

6.2.2.4 Building new jetties at the following locations and Developing Facilities around them (Map No. 24):

- Global Pagoda Jetty
- Marve Jetty

Approach

Global Pagoda is a major attraction and a huge number of visitors is anticipated. Presently the options to reach Global Pagoda are from the Marve-Manori and Gorai-Borivali jetty via road. A jetty at Global Pagoda will enable direct access to its premises.

Marve from where the boats depart for Manori and the Essel World jetties has no jetty, the boats just about the sandy creek edge. This causes difficulties not only for the tourists and residents but poses a tremendous challenge/risk to the two wheelers. Construction of jetties at Marve beach and at Global Pagoda will improve the connectivity

Principles

- Jetty and facility design to respond to the surroundings.
- Greater space allocation for pedestrians
- Use of material that is harmonious with the surroundings, slows traffic

Features

- Marve jetty
 - Construct an RCC Jetty
- Amenity center at Marve Jetty
 - Ticketing counter
 - Information kiosk / center
 - Rest rooms
 - Refreshment areas
 - Waiting area
 - Limited parking for two wheelers and cars and autos
- Construction of the Marve jetty can be taken up by the Mumbai Maritime Board (MMB). The jetty required for the Global Pagoda may be developed by the Vipassana Trust
- Detailed engineering designs and plans will have to be prepared integrating the jetties and the amenity centers

Costs

The cost of the jetty for the Global Pagoda may be borne by the Vipassana Trust. The cost of the jetty at Marve may be borne by MCGM or Mumbai Maritime Board. Hence costs estimated below are not to be borne by the Planning Authority.

Table No. 6.14: Estimated Construction Cost of a New Jetties

No	Description	Costs (Rs. Cr.)
1	New Jetty at Global Pagoda : Block cost of construction @ Rs. 30,055 / sq m* (length 50 m x width 8 m = 400 sq m)	1.20
2	New Jetty at Marve : Block cost of construction @ Rs 30,055/sq m* (length 50 m x width 8 m = 400 sq m)	1.20
	Total	2.40

* estimated from ongoing construction and includes civil works, labour and equipment

6.2.2.5 Introduction of Small Sized Buses using CNG within the MGU Notified Area

Approach

The MGU Notified Area is ecologically sensitive and to a large extent left undisturbed. The activities that are being envisaged to develop it as a tourism and recreation area, should be sensitive towards preserving the beauty of the area and its pristine surroundings. At present, buses are the main mode of transportation to move within the MGU Notified Area. These are conventional large buses running on diesel / petrol. They face difficulty in navigation on account of narrow and winding roads and there is air pollution on account of this.

It is proposed to introduce small buses operated on CNG which will be able to access the area better and reduce pollution. Introducing an efficient public transportation working on non conventional energy resources / alternative fuels will be one such step towards maintaining the quality of air and reduce air pollution in this area.

Features

- Smaller attractive buses running on CNG for movement of locals and tourists.
- The service can be run by MSRTC/Municipal Transport Services

6.2.2.6 Redefining the Bus Routes, designating Bus Stops and Bus Depot (Map No. 25)

Approach

Buses operated by MSRTC are the main mode of public transport for people to move in and out of the MGU Notified Area. These ply on the main spine – the north south road. As it is proposed to develop the MGU Notified areas as a tourism and recreational area, many new areas/ locations, important from tourism and recreational point of view will have to be made accessible by motorable road and an efficient bus route. A new road network for the area is designed with the objective of providing better connectivity and access to such area. With this it is also important to redefine the bus routes and identify new bus stops for the convenience of the tourist and locals alike.

Features

- Two main zones are identified in which busses will run on different routes:
 - Zone A - Gorai – Manori Zone
 - Zone B - Uttan – Chowk Zone
- Zone A includes the following routes
 - **Route 1** Marve – Manori – Gorai – Marve
 - 1. **Route 1 (UP)** – Marve beach – Manori Jetty (via proposed bridge) – Manori Gorai road - Gorai Junction – Junction J26 – Link N24 – Junction J36 - Manori Gorai road – Link No. 2 and return to – Gorai Junction – Manori Gorai Road - Manori Jetty – Marve beach.
 - 2. **Route 1 (DOWN)** – Marve beach – Manori Jetty (via proposed bridge) – Manori Gorai road - Gorai Junction – Link No. 2 and return to – Gorai Junction J36 – Link N24 – Junction J26 - Gorai Junction - Manori Gorai road – Manori Jetty – Marve beach.
 - The length of the Route 1 (Up and Down) is 26 Km.
- Zone B includes the following routes
 - **Route 2** Morva – Dongri – Uttan – Chowk – Dongri – Morva
 - 1. **Route 2 (UP)** – Morva – Dongri Junction – N46 – Link 9 - Bhut Bangla Junction - Junction J45 – Link 14 – Link N32 – Junction J36 – Link 9 - Bhut Bangla Junction - Link 18 - Junction J47 – Chowk Road (19,20,21) – Junction J60 – Dongri Link 22 – Dongri Junction – Link N46 – Junction J67 – Junction J68 - Morva.
 - This route is 19.95 Km in length.

2. **Route 2 (DOWN)** – Morva – Dongri Junction –Chowk Road (19) – Junction J58 – Link N33 – Junction J45 – Link 18 – Bhut Bangla Junction – Link 9, Junction J36 – Link N24 – Link N32 – Link 14 – Junction J45 – Link 18 – Bhut Bangla – Link 9– Dongri Junction – Morva.

– This route is 20.00 Km in length.

- Two main interchange points have been proposed – one at Junction J36 in Gorai and the other J45 in Uttan.
- The proposed routes have incorporated 55 existing bus stops and 18 new bus stops are proposed. Details are given below:

Table No. 6.15: List of Proposed Bus Stops

No	Bus Stand No. / Name	Bus Stand Location	Village	On Route
1	Gorai Beach BS	Near J26	Gorai	Route 1 (up & down)
2	Whispering Palm BS	Near J27	Gorai	Route 1 (up & down)
3	Kings Ship BS	Near N26	Gorai	Route 1 (up & down)
4	Pixi BS	Near N29	Gorai	Route 1 (up & down)
5	BS 1	Near J35	Gorai	Route 2 (up & down)
6	Change over point (Depot)	Near J35	Gorai	Route 1 (up & down) Route 2 (up & down)
7	Change over point (Depot)	Near J45	Uttan	Route 1 (up & down) Route 2 (up & down)
8	BS 2	Near J40	Uttan	Route 2 (up & down)
9	BS 3	Near J44	Uttan	Route 2 (up & down)
10	BS 4	Near J56	Pali	Route 2 (down)
11	St. Francis Nagar BS	Near J51	Uttan	Route 2 (down)
12	Chowk Jetty BS	Along Link 22	Chowk	Route 2 (up & down)
13	BS 5	Along Link 22, Tarodi Gaothan	Tarodi	Route 2 (up & down)
14	BS 6	Along Link 22, Tarodi Gaothan	Tarodi	Route 2 (up & down)
15	BS 7	Near J62	Dongri	Route 2 (up & down)
16	Mantanpada BS	Near J-16	Manori	Route 1 (up & down)
17	Dargah BS	Along link N-7	Manori	Route 1 (up & down)
18	Dominica Wadi BS	Near J-72	Manori	Route 1 (up & down)

- The routes will have to be operated by MSRTC/Municipal Transport Services.
- New bus stops will have to be developed and the old ones will have to be refurbished.

6.3 Social Infrastructure and Amenities

6.3.1 Approach

The usual system of obtaining land for the amenities in Development Plans in Maharashtra is observed to be 'reserving' lands. The local bodies, however, are generally not in a position to acquire these lands and they get encroached upon. This happens, at times, to lands that are acquired by the local bodies.

The following approach was adopted for the development plan for MGUNotified area:

- Adopt a 'minimalist' approach to social/public amenities, by establishing and providing for only those which are absolutely required and access to which must be ensured.
- Adopt rationalized and appropriate standards.

Further, the following were taken into consideration while arriving at the norms :

1. Standards for the revised Development Plan for Mumbai (GMDP), 1981
2. Recommendation of the Sukthankar Committee on Planning Standards (CPS), 2002
3. Standards for Navi Mumbai (NM), 2002

Based on the evaluation of the above 3 standards, a set of social infrastructure and amenities are proposed for the MGU Notified Area. They are in line with the approach outlined above and keep in view the vision for the area as a tourism and recreation destination. It is proposed to provide basic education, health and amenities that are critical for the development of the area. These are given in Section 5.4 under 'Planning Norms Adopted'.

All the reservations made for 'public purpose' in the Development Plans of MCGM and MBMC for MGU Notified area were listed and verified with the base map and satellite image. Issues that emerged were a) either the area was already built up, b) there were area discrepancies, c) there were mismatches between the survey numbers etc. Based on this, an assessment was made whether to continue or not with the reservation, re-assign another use, modify its shape/size, shift it slightly etc.

Based on the adopted standards, review of the Development Plan reservations, special requirements of the area and availability of open land the social infrastructure and amenities required for the area are arrived at. An effort was made to locate these as far as possible on government lands to reduce the burden of the implementation of the development plan.

6.3.2 Proposals

Reservations are made for the following social infrastructure and amenities:

Table No. 6.16: Categories of Land Reservation for Social Amenities and Public Utilities

No.	Reservations for Public Amenities	Nos.	Area (Ha)
1	Educational facilities	12	5.39
2	Health facilities	02	0.66
3	Recreational Greens & Playgrounds	22	44.28
4	Burial grounds/crematoria	05	2.02
5	Fishing related activity	02	2.05
6	Tourist amenities and information centers	07	1.25
7	Parking lots & bus depots	07	5.26
8	Sewage Treatment Plants	06	3.20
9	Landfill site	01	22.03
10	Slaughter House	01	0.37
11	Police Station & Police Posts	04	0.89
12	Fire Station	01	0.44
13	Municipal Office	02	1.40
	Total	72	89.23

6.3.2.1 Reservation of Lands for Educational Facilities (Map No. 26)

Features

- The existing municipal schools and church run schools have been taken into consideration while computing the requirement for schools. These have been indicated as existing facilities in the DP. Where there is a shortfall, new plots are reserved. While doing this, to the extent possible, the earlier reservations from the sanctioned Development Plans of MCGM and MBMC are retained, if not already developed. Where adjustment in terms of shift in location, shape or/and size is required, the same is done.

- An attempt is also made to add a reservation for play ground next to the school which will serve not only the school but also meet the needs of the community, during non school hours. This is calculated towards open space requirements and included in proposal 6.3.2.3 below.
- 20 percent of population is expected to be of school going age, upto secondary school. Based on the norm of 2 sq.mt per pupil, this gives rise to 17,000 pupils and 34,000 sq m. of school built-up area as well as 34,000 sq m of school Playgrounds.
- A total of 9 schools, both Primary and Secondary are proposed with a land area of 31,607 m². In addition to this, there are 7 primary and 5 secondary existing schools. The proposed and the existing schools, both in numbers and built up area are adequate against the requirement of 34,000 sq m as per the above mentioned norm. The total land and built up area of all the schools is given in Table no. 6.17.

Table No. 6.17: Estimation of Land and BUA Requirement for Educational Facilities

No.	Name of the Reservation	Village	Govt. Land (sq m)	Pvt. Land (sq m)	Total Land (sq m)	Land Acquisition Cost (Rs Cr.)*	Zone FSI	Built Up Area (sq m)
a Primary & Secondary Education Facilities								
1	Secondary School	Uttan		3,393	3,393	0.31	1.00	3,393
2	Primary School	Uttan	2,800		2,800	0.00	1.00	2,800
3	Primary School	Uttan		2,534	2,534	0.24	1.00	2,534
4	Prim. & Sec School	Dongri		4,480	4,480	0.45	1.00	4,480
5	Prim. & Sec School	Tarodi		1,846	1,846	0.15	1.00	1,846
6	Secondary School	Morva		1,470	1,470	0.15	1.00	1,470
7	Secondary School	Manori	3,987		3,987	0.00	0.30	1,196
8	Primary, Secondary school & PG	Gorai	7,380		7,380	0.00	0.10	738
9	Secondary School	Gorai		3,717	3,717	2.75	0.10	372
	Sub-total (a)		14167	17440	31607	4.03		18,829
b Higher Educational Facilities								
1	College/ Training Center	Uttan	5729		5729	0.00	0.30	1,719
2	College/ Training Center	Manori	2,658		2,658	0.00	0.30	797
3	Judicial Academy	Uttan	13,886		13,886	0.00	0.30	4,166
	Sub-total (b)		22273		22273	0.00		6,682
	Total		36,440	17,440	53880	4.03		25,511

* Rates of land acquisition taken from Ready Reckoner 2011. Refer Table No. 6.50 in Section 6.10. for detailed breakup.

Costs

Blocks costs for development and land acquisition would be as follows:

Table No. 6.18: Estimated Cost of Land Acquisition and Development of Educational Facilities

No.	Description	Area (sq m)	Costs (Rs. Cr.)
1	land acquisition costs	17,440	4.03
2	Development costs @ 12000/sq m of BUA*	21,345 [†]	25.61
	Total		29.64

* Rates arrived on the basis of ongoing construction of schools and are inclusive of basic furniture.

[†] Excluding the Development Cost for Judicial Academy

6.3.2.2 Reservation of Lands for Health Facilities (Map No. 26)

Features

- There are several small existing facilities being provided by private doctors. However there is a lack of emergency facilities in the planning area. For the projected population of about 85,000 it is estimated that one hospital with 50 beds and 1 dispensary-cum-maternity home of 25 beds each are required. This is in addition to the existing facilities already available in the area.

- One large existing hospital, namely Stella Maris Hospital with an approximate land area of 5,000 sq m is indicated as an existing facility in the plan. The location is almost central in the MGU Notified Area and is well connected. There is an existing health center in Gorai which is shown as an existing facility.

Table No. 6.19: Estimation of Additional Health Facilities Required

No.	Facility	Village	Area (sq m)
1	Hospital in Manori	Manori	4,682
2	Dispensary and Maternity Home at Uttan	Uttan	1,903
	Total		6,585

- The total land requirements and built up area for all the health facilities is given below:

Table No. 6.20: Estimation of Total Land and BUA Requirement for Health Facilities

No	Name of the Reservation	Planning Unit	Govt. Land (sq m)	Pvt. Land (sq m)	Total Area (sq m)	Land Acquisition Cost (Rs. Cr.)	Zone FSI	Built Up Area (sq m)
1	Hospital in Manori	Manori	4682	0	4,682	0.00	0.3	1,405
2	Dispensary & Maternity Home	Uttan	1903	0	1,903	0.00	1.0	1,903
	Total		6,585	0	6,585	0.00		
								3,308

Costs

Blocks costs for development and land acquisition would be as follows:

Table No. 6.21: Estimated Cost of Land Acquisition and Development of Health Facilities

No.	Description	Area (sq.m)	Costs (Rs. Cr.)
1	Land acquisition costs	0.00	0.00
2	Development costs for 1 Hospital, 1 Dispensary & Maternity Home and 1 health center @ 18,000/sq m of BUA*	3,308	5.95
	Total		5.95

* Rates arrived on the basis of ongoing construction of hospitals and are inclusive of basic services such as fire fighting, air conditioning and basic equipment.

6.3.2.3 Recreation Grounds and Playgrounds (Map No. 26)

Features

- Smaller neighbourhood level open spaces are provided in the form of 11 play grounds attached to the schools. These can be used by the community during non school hours. Where ever possible they are placed on government land.
- Development of larger open spaces is linked with large water bodies. There are 10 large talavs in the Notified Area. Adequate land is reserved around 7 of these talavs so that they are developed and visited by resident population and become added to tourist attractions.
- 67.35 ha. area falling in villages Manori and Gorai is earmarked as a Botanical Garden and Nursery which will be a regional facility. It will be a great tourist attraction and a potential revenue generator.
- 3 other open spaces are provided – near the Geological Rock Formations & at Chimaji Appa Memorial Park in Chowk and a large PG in Manori. In addition to these, a public playground has been provided on the Government Land in Gorai.
- In all about 31.47 ha of open spaces is created – 18.11 ha around 7 talavs (excluding talav area), 3.57 ha of 11 playgrounds and 4 recreational areas of about 9.79 ha. Considering the projected population of 85,000 this works out to be about 3.70 sq m per person.

Table No. 6.22: List of Proposed Recreation Grounds and Play Grounds

No.	Name of the Reservation	Planning Unit	Total Area (sq m)
Playgrounds			
1	Playground attached to School	Pali	3,818
2	Playground attached to School	Uttan	2,304
3	Playground attached to School	Uttan	2,660
4	Playground attached to School	Uttan	3,484
5	Playground attached to School	Dongri	3,645
6	Playground attached to School	Tarodi	3,096
7	Playground attached to School	Morva	1,550
8	Playground attached to School	Manori	5,564
9	Playground attached to School	Manori	2,269
10	Playground attached to School	Manori	3,752
11	Playground attached to School	Manori	3,608
Sub Total			35,750
Recreational Areas			
12	Columnar Basalt Viewing Spot	Chowk	2,500
13	Chimaji Appa Memorial Park	Chowk	43,200
14	PG, Recreation & Parking	Manori	21,851
15	Public Playground	Gorai	30,344
Sub Total			97,895
Area developed around Talavs			
16	Gorai Junction Talav & Garden	Gorai	1,998
17	Vairala Lake & Garden	Gorai	7,670
18	Uttan Talav & Garden	Uttan	70,216
19	Keshav Shrishti Talav & Garden	Uttan	85,123
20	Golconda Talav & Garden	Dongri	9,614
21	Dongri Talav & Garden	Dongri	1,189
22	Morva Talav & Garden	Morva	5,258
Sub Total			1,81,068
Total			3,14,713

Costs

The estimated land requirement for recreation and open spaces is as given in Table no. 6.23:

Table No. 6.23: Estimated Land Requirement for Recreation Grounds and Playgrounds

No.	Name of the Reservation	Planning Unit	Govt. Land (sq m)	Pvt. Land (sq m)	Total Area (sq m)	Land Acquisition Cost (Rs. Cr.)*
Playground						
1	Playground	Pali	3,818		3,818	0.00
2	Playground	Uttan		2,304	2,304	0.21
3	Playground	Uttan		2,660	2,660	0.24
4	Playground	Uttan	3,484		3,484	0.00
5	Playground	Dongri		3,645	3,645	0.36
6	Playground	Tarodi		3,096	3,096	0.25
7	Playground	Morva		1,550	1,550	0.16

8	Playground	Gorai	5,564		5,564	0.00
9	Playground	Manori		2,269	2,269	1.68
10	Playground	Manori	553	3,199	3,752	2.37
11	Playground	Manori	133	3,475	3,608	2.57
	Sub Total		13,552	22,198	35,750	7.83
Recreational Areas						
12	Columnar Basalt Viewing Spot	Chowk	2,500		2,500	0.00
13	Chimaji Appa Park	Chowk	43,200		43,200	0.00
14	PG, Recreation & Parking	Manori	17,995	3,856	21,851	2.85
15	Public Playground	Gorai	30,344		30,344	0.00
	Sub Total		94,039	3,856	97,895	2.85
Area to be developed around Talavs						
16	Gorai Junction Talav	Gorai		1,998	1,998	1.48
17	Vairala Lake	Gorai	250	7,420	7,670	5.49
18	Uttan Talav	Uttan	13,096	57,120	70,216	5.14
19	Keshav Shrishti Talav	Uttan	10,182	74,941	85,123	6.74
20	Golconda Talav	Dongri	6,466	3,148	9,614	0.19
21	Dongri Talav	Dongri	1,189		1,189	0.00
22	Morva Talav & Garden	Morva		5,258	5,258	0.53
	Sub Total		31,183	1,49,885	1,81,068	19.57
	Total		1,38,774	1,75,939	3,14,713	30.25

* Rates of land acquisition taken from Ready Reckoner 2011. Refer Table No. 6.50 in Section 6.10 for detailed breakup

Table No. 6.24: Estimated Cost of Developing Playgrounds

Area under Play grounds (Sq m)	Cost for landscaping (Rs. Cr.) @ Rs.300/sq m	Lighting Nos. l fitting for every 1000 sq m	Cost of Lighting (Rs. Cr.) @ Rs. 3500/ fitting	Amenities (Lump Sum) (Rs. Cr.)	Furniture (Lump sum) (Rs. Cr.)	Total Cost (Rs. Cr.)
66,094	1.98	66	0.23	0.1	0.1	2.41

Table No. 6.25: Estimated Cost of Developing Open Spaces Around 7 Talavs

Sr. No	Talav	Area for development (sq m)	Cost for landscaping @ Rs. 300/sq m (Rs. Cr.)	Lighting Nos. (l fitting for 1000sq m)	Cost of Lighting @ Rs. 3500/ fitting (Rs. Cr.)	Amenities (Lump Sum) (Rs. Cr.)	Furniture (Lump sum) (Rs. Cr.)	Total Cost (Rs. Cr.)
1	Gorai Junction Talav	1,998	0.06	2	0.01	0.1	0.1	0.27
2	Vairala Lake	7,670	0.23	8	0.03	0.1	0.1	0.46
3	Uttan Talav	70,216	2.11	70	0.25	0.1	0.1	2.55
4	Keshav Shrishti Talav	85,123	2.55	85	0.30	0.1	0.1	3.05
5	Golconda Talav	9,614	0.29	10	0.03	0.1	0.1	0.52
6	Dongri Talav	1,189	0.04	1	0.00	0.1	0.1	0.24
7	Morva Talav	5,258	0.16	5	0.02	0.1	0.1	0.38
		1,81,068	5.43	181	0.63	0.70	0.70	7.47

¹ Unit cost of landscaping is Rs. 300 per sq m. This includes plantations, earthwork, hard & soft landscaping.

² The number of lamp posts is considered as 1 lamp post per 1000 sq m of the total developable area. This has been deduced by calculating an average across the 7 talavs. Cost of one lamp post is taken as Rs. 35,000.

³ Costs of furniture and other amenities are considered as Rs. 10 lakh lump sum.

Block costs for development and land acquisition for recreation and open spaces is as follows:

Table No. 6.26: Estimated Cost of Land Acquisition & Development of Recreation Grounds and Playgrounds

No.	Description	Area (sq m)	Costs (Rs. Cr.)
1	Land acquisition costs*	1,75,939	30.25
2	Development cost for playgrounds	66,094	2.41
3	Development cost of 7 reserved Talavs	1,81,068	7.47
4	Development cost of 3 recreational areas	67,551	3.38
	Total		43.51

* Rates of land acquisition taken from Ready Reckoner 2011. Refer Table No. 6.50 in Section 6.10 for detailed breakup

6.3.2.4 Reservation of Lands for Crematoria / Burial Grounds (Map No. 26)

Features

- As a policy existing crematoriums / burial grounds are shown as existing facilities and in addition 5 reservations are proposed.
- There are no cost implications on the provision of these.

Table No. 6.27: List of Proposed Reservations for Burial Grounds / Crematoria

No	Name of the Reservation	Planning Unit	Total Area (sq m)	Private land (sq m)	BUA in sq m @ 0.1 FSI	Land Acquisition Cost (Rs. Cr.)	Cost of land devp. @ Rs. 500/sq m (Rs. Cr.)	Cost of Const. @ Rs. 10,000/sq m (Rs. Cr.)	Total Cost (Rs. Cr.)
1	BG/ Crematorium (on Govt. land)	Chowk	10,299		1030		0.51	1.03	1.54
2	BG/ Crematorium (on Govt. land)	Uttan	1,530		153		0.08	0.15	0.23
3	BG/ Crematorium (on Private land)	Gorai	2,747	2,747	275	2.03	0.14	0.28	2.45
4	BG/ Crematorium (on Private land)	Manori	3,705	3,705	371	2.74	0.19	0.37	3.30
5	BG/ Crematorium (on Private land)	Manori	1,908	1,908	191	1.41	0.10	0.19	1.70
	Total		20,189	8,360	2,019	6.18	1.02	2.02	9.22

6.3.2.5 Reservation of Lands for Fishing Related Activity (Map No.26)

Features

- Part of the land required for fishing related activities has been taken care of by earmarking a special zone for Fishing & Allied Activities, which will be available for fishing related activities
- In addition, the following reservations have been proposed to promote fishing as an activity in the area

Table No. 6.28: List of Proposed Reservations for Fishing Related Activity

No	Name of Reservation	Planning Unit	Area under Govt. (sq m)	Area under Pvt. (sq m)	Total Area (sq m)	Remarks
1	Boat Repair Workshop	Chowk	2,200		2,200	MBMC's current DP reservation (3). There is slight change in area as reservation partly falls on jetty which is excluded.
2	Cold Storage Facility, Fish Processing Unit & Fish Market	Pali, Uttan	2,759	15,582	18,341	Reservation no.11 of current DP of MBMC for fishing activity and cold storage falls on Mangroves and creek and on already developed area. It is shifted to a more appropriate location and reconfigured.
	Total		4,959	15,582	20,541	

Costs

Costs are not estimated as the facilities are expected to be developed by land-owners themselves.

6.3.2.6 Reservation of Lands for Tourist Amenity and Information Centers

(Map No. 26)

Features

- Tourist/ visitor amenity centers are proposed at key locations – at Manori jetty / bridge, Gorai jetty, Morva which is an entry point into the MGU Notified Area and Manori.

Table No. 6.29: List of Proposed Reservations for Tourism Amenity Centers

No	Name of the Reservation	Planning Unit	Govt. Land (sq m)	Pvt. Land (sq m)	Total Area (sq m)	Land Acquisition Cost (Rs. Cr.)*	Applicable FSI	BUA (sq m)
1	Tourist Amenity Centre	Dongri	1,011		1,011	0.00	1.00	1011
2	Tourist Amenity Centre	Manori		1,300	1,300	0.96	0.30	390
3	Tourist Amenity Centre	Gorai	1,334		1,334	0.00	0.10	133
4	Tourist Amenity Centre	Gorai	2,532		2,532	0.00	0.30	760
5	Tourist Amenity Centre	Gorai	1,783		1,783	0.00	0.30	535
6	Tourist Amenity Centre	Manori	3,229		3,229	0.00	0.30	969
7	Tourist Amenity Centre	Manori	1,297		1,297	0.00	0.30	389
	Total		11,186	1,300	12,486	0.96		4,187

* Rates of land acquisition taken from Ready Reckoner 2011. Refer Table No. 6.50 in Section 6.10 for detailed breakup....

Costs

Blocks costs for development and land acquisition would be as follows:

Table No. 6.30: Estimated Cost of Land Acquisition and Development of Tourism Amenity Centers

No.	Description	Area (sq m)	Costs (Rs. Cr.)
1	Land acquisition costs	1,300	0.96
2	Development costs @ 10,000/sq m of BUA*	4,187	4.19
	Total		5.15

* Rates arrived on the basis of ongoing construction rates.

6.3.2.7 Reservation of Land for Parking Lots and Bus Depots (Map No. 26)

Features

- 5 parking lots and 2 bus depots as listed in Table no. 6.34 are proposed in the area:

Table No. 6.31: Estimated Cost of Land Acquisition for Parking Lots & Bus Depots

No	Location	Planning Unit	Govt. Land (sq m)	Pvt. Land (sq m)	Total Area (sq m)	Land Acquisition Cost (Rs. Cr.)*
1	Near Gorai junction	Gorai		4,170	4,170	3.09
2	At J36 in Gorai	Gorai	11,067		11,067	0.00
3	At J13 near Manori-Gorai Road	Manori	4,030		4,030	0.00
4	Near Link N21, Essel World+	Gorai		4,021	4,021	0.00
5	Near Link N21, Essel World+	Gorai		5,670	5,670	0.00
6	Bus Depot	Gorai	11,397	573	11,970	0.42
7	Bus Depot	Uttan	944	10,738	11,682	0.97
	Total		27,438	25,172	52,610	4.48

* Rates of land acquisition taken from Ready Reckoner 2011.

+The parking lots at Global Pagoda are already acquired.

Costs

Blocks costs for development and land acquisition are as follows:

Table No. 6.32: Estimated Cost of Land Acquisition & Development of Parking Lots

No.	Description	Area (sq m)	Costs (Rs. Cr.)
1	Land acquisition costs	15,480	4.48
2	Development cost of parking lots and bus depots** @ 5000/sq m*	52,610	26.31
	Total		30.78

* Rates arrived on the basis of ongoing construction rates

** Buildings required in the Bus depots are expected to be built by the transport agencies operating the bus services.

6.3.2.8 Reservation of Land for Police Stations & Posts (Map No. 26)

Land for a police station and 4 police posts have been reserved in the DDP keeping in mind the security of the coast and the large number of tourists expected to visit the area.

Table No. 6.33: Estimated Cost of Land Acquisition for Police Stations & Posts

No	Name of the Reservation	Planning Unit	Govt Land sq m	Pvt. Land sq m	Total Area sq m	Land Acquisition cost (Rs.Cr.)	App. FSI	BUA sq m
1	Police Station	Uttan	1,205		1,205	0.00	0.3	362
2	Police Post	Dongn	303		303	0.00	1.0	303
3	Police Post nr. Bus depot	Gorai	6861		6861	0.00	0.3	2058
4	Police Post	Manori	500		500	0.00	0.1	50
			8,869		8,869	0.00		2,773

Costs

Blocks costs for land acquisition and development are as follows:

Table No. 6.34: Estimated Cost of Land Acquisition and Development of Police Stations & Posts

No.	Description	Area (sq m)	Costs (Rs. Cr.)
1	Land acquisition costs	0.0	0.00
2	Development costs @ 10,000/sq m* +	2,773	2.77
	Total		2.77

* Rates arrived on the basis of ongoing construction rates

+ Development cost is expected to be borne by the Police Department.

6.3.2.8 Reservation of Land for Other Amenities (Map No. 26)

Other amenities constitute of a proposed slaughter house in Uttan and a welfare center in Manori.

Table No. 6.35: Estimated Cost of Land Acquisition for Other Amenities

No	Name of the Reservation	Planning Unit	Govt. land (sq m)	Pvt. Land (sq m)	Total Area (sq m)	Land Acquisition Cost (Rs. Cr.)*	Applicable FSI	BUA (sq m)
1	Municipal office	Gorai	8932		8,932	0.00	0.3	2,680
2	Municipal office	Uttan	5,067		5,067	0.00	0.3	1,520
3	Fire station	Uttan	4,439		4,439	0.00	0.3	1,332
4	Slaughter house	Uttan		3,673	3,673	0.33	0.1	367
	Total		18,438	3,673	22,111	0.33		5,899

* Rates of land acquisition taken from Ready Reckoner 2011. Refer Table No. 6.50 in Section 6.10 for detailed breakup.

Costs

Blocks costs for development and land acquisition are as follows:

Table No. 6.36: Estimated Cost of Land Acquisition and Development for Other Amenities

No.	Description	Area (sq m)	Costs (Rs. Cr.)
1	Land acquisition costs	3,673	0.33
2	Development costs of fire station @ Rs. 10,000/sq m*	1,332	1.33
3	Development costs of Municipal Offices & Slaughter house @ Rs. 1000/sq m*+	4,567	0.46
	Total		1.66

*Rates arrived on the basis of ongoing construction rates

+ Municipal Offices and Slaughter house are expected to be developed by the respective Municipal Corporations

Table No. 6.36(a): Statement of Planning Unit-wise Reservation of Land for Social Amenities and Public Utilities

Sr. No	Planning Unit/Village	Projected Population (2022)	Description	Schools	College/Training Center	Health facilities	Recreation Grounds and Play Grounds	Burial grounds/Crematoria	Fishing related activity	Tourist amenities and information centers	Parking lots	Bus Depots	Police Station & Posts	Fire station	Sewage Treatment Plants	Landfill site	Slaughter House	Municipal Office	Total
1	Morva	5,524	Nos.	1			2								1				4
			Area	1,470			6,808									2,227			
2	Dongri	8,970	Nos.	1			3			1			1		1				7
			Area	4,480			14,448				1,011			303		4,723			
3	Tarodi	4,797	Nos.	1			1												2
			Area	1,846			3,096												
4	Chowk	7,327	Nos.				2	1	1								1		5
			Area				45,700	10,299	2,200									2,20,254	
5	Pali	4,135	Nos.				1		1										2
			Area				3,818			18,341									
6	Uttan	38,127	Nos.	3	2	1	5	1				1	1	1	2		1	1	19
			Area	8,727	19,615	1,903	1,63,787	1,530					11,682	1,205	4,439	18,578		3,673	5,067
7	Gora	8,474	Nos.	2			3	1		3	4	1	1					1	16
			Area	11,097			40,012	2,747			5,649	24,928	11,970	6,861					8,932
8	Mantri	7,217	Nos.	1	1	1	5	2		3	1		1		2				17
			Area	3,987	2,658	4,682	37,044	5,613			5,826	4,030		500		6,490			
Total	84,571	84,571	Nos.	9	3	2	22	5	2	7	5	2	4	1	6	1	1	2	72
			Area	31,607	22,273	6,585	3,14,713	20,189	20,541	12,486	28,958	23,652	8,869	4,439	32,018	2,20,254	3,673	13,999	7,64,256

Note: All areas are in sq. m.

The adequacy of health, education & open spaces against the norms adopted in the DDP are already discussed under relevant paras in this Chapter.

6.4 Recreation and Tourism

6.4.1 Issues and Opportunities

The tourism and recreation potential of the area can be enhanced by bringing about a comprehensive development by proposing interventions across all sectors.

At present few sites in the area are well known and visited. These will have to be developed, promoted and made appropriately accessible in order to attract a wide range of visitors and positively impact the local economy. The already popular sites also have issues like lack of amenities, ease of access, solid waste management etc. Suitable interventions will be necessary to make the site more attractive.

There are many small resorts and holiday homes catering to the local tourists visiting the area usually on the weekends from Mumbai and Mira Bhayander. The present tourist activities take place in an unorganized manner where many of the villagers rent out rooms to tourists or old estates have been converted to resorts. The area has potential to be developed as an important tourist destination but severely lacks the supporting infrastructure. At present tourism is on a much smaller scale, of low quality and no major efforts or interventions have been initiated to give impetus to this activity.

Keeping in mind the ecological sensitivity of the planning area, it is necessary at the same time that the development activities are proposed in an environmentally sustainable manner.

6.4.2 Proposals

- 1 Facilitating the development of Tourism Development Zone
- 2 Development of the Gorai and Manori beaches with facilities
- 3 Setting up tourist amenity and information centers at Morva, Gorai Jetty, Manori Jetty and along the beaches
- 4 Development of mangrove park near Global Pagoda
- 5 Development of mangrove board walk from Gorai jetty road
- 6 Developing and operating the mangrove boat ride from Gorai jetty
- 7 Operating fish tours (seasonal)
- 8 Designing and developing promotional material for the area
- 9 Organizing special events (annually/monthly)

6.4.2.1 Facilitating Development of Tourism Development Zone **(Map No.27)**

Approach

Presently there are in all 67 establishments which provide boarding and lodging services to the tourists visiting the area. The establishments mainly attract lower middle and middle income group tourists. Majority of them do not have facilities to attract tourists with higher spending capacities.

The proposals in the Tourism Development Zone have been formulated to cater to the existing tourists as well as attract tourists with higher spending capacities. Secondly the existing establishments are consolidated into a number of zones to concentrate and provide a variety of tourist activity such as holiday resorts, and theme/amusement park (refer Table no. 6.3).

Features

- The area adjacent to Gagangiri temple located at the southernmost tip of Manori village, area adjacent to Samulai knoll and Dongri Ridge are government lands, for which detailed master plans will have to be prepared
- The remaining proposals are on private lands. The proposed locations in Manori, Culvem and Gorai may be developed by preparing detailed layout plans and implementing them through strategies such as Town Planning Scheme wherein a proportion of land can be appropriated for internal streets/circulation and amenities.
- The sites identified under Tourism Development Zone may be developed as suggested in Table no. 6.37:

Table No. 6.37: Proposed Area and Activities in Tourism Development Zone

No.	Name	Area (Ha)	Activity Proposed
1	Pali-Chowk	5.12	Resorts
2	Uttan	29.98	Leisure, Wellness Resorts, Culture Centres, etc.
3	Samulai	37.04	Resorts
4	Gorai Beach	125.68	Leisure, Wellness Resorts, Theme Restaurants, Crafts & Food Haats, Culture Centres, etc.
5	Essel World	51.33	Amusement Park (existing)
6	Global Pagoda		Cultural and Spiritual Centre (existing)
7	Manori Resorts	36.97	Leisure, Wellness Resorts, Theme Restaurants, Crafts & Food Haats, Culture Centres, etc.
8	South Manori	21.98	Theme Park, Crafts and Food Haats
		308.20	

6.4.2.2 Development of the Gorai and Manori Beaches with Facilities (Map No. 27)

Approach

MGU Notified Area is predominantly known for its beaches and Essel World. There are two beaches at Manori and Gorai of which Gorai beach is more popular among the tourists. The beach is lined with various resorts and picnic spots. Many hawkers are observed along the beach especially near the entry point to the Gorai beach.

As this beach receives many tourists, garbage is observed strewn along the beach. The restaurants and resorts also dump their kitchen waste on to the beach. Some recreational activities observed on the beach are horse rides and volleyball.

Manori beach is located on the west coast, next to Manori village. It comparatively gets lesser crowd and is not as commercial as Gorai. It is lined with beachside cottage hotels. The only tourists seen on the beach are the visitors staying in resorts abutting the beach.

The beaches are underutilized as they lack adequate recreational facilities and public utilities. In order to tap the tourism potential of the beaches, Tourism Development Zones have been demarcated along Gorai and Manori beaches and are proposed to be developed for leisure and cultural activities. Water sports related activities like kayaking and parasailing could be developed. Further public facilities such as toilets and tourist information centers are proposed to tap the resident tourist population and encourage floating tourists to visit the beaches.

Features

- Gorai beach can be developed with a focus on water sports and parasailing activities
- Manori beach can be developed with a focus on horse riding, beach sports and passive seating areas
- Detailed layouts for both beaches will have to be prepared to allocate spaces for these activities, spaces for mobile vendors, seating areas, baths/changing area/toilets with bio compost, segregated garbage bins and limited parking.

Revenues

Possible revenue sources:

- Rides
- User charges for amenities, parking
- License fee from mobile vendors and vendors operating the riding, parasailing facilities.

6.4.2.3 Setting up Tourist Amenity and Information Centers along the beaches and at Morva, Gorai Jetty, Manori Jetty and Manori (Map No. 27)

Approach

The MGU Notified Area is envisaged to be developed as tourism and recreational place and many new tourism and recreational activities are proposed to be developed in the area. Information on these must be available at convenient locations to the visitors coming into the area.

Features

- 3 small information / amenity centers at Morva, Gorai and Manori at entry points are proposed. These will house counters for ferry tickets, toll collection, sale of tickets for board walks, mangrove ride etc, restrooms, water fountains, seating area, a small cafe, internet point, pay phones, information counter, vending machines and a convenience store.
- In addition to these, 4 larger tourist amenity centers are proposed near the beaches. These will house Changing rooms, Public Convenience, Restaurants, ATMs, Nature Interpretation Center, Parking Hawking Plaza, etc.
- Land for these is reserved in the development plan.
- These centers can be developed and operated by MTDC or private sector

Costs

Costs are estimated in Section 6.3.

6.4.2.4 Development of a Mangrove Park near Global Pagoda (Map No. 22 & 27)

Approach

Mangroves are the most important ecological features of the MGU Notified Area. Apart from taking measures to preserve and rejuvenate them it is also important to raise awareness about their importance. This will be crucial for their preservation. A way to go about this is to sensitively turn some areas as special gardens where people can appreciate them.

One of the major attractions in the MGU Notified is the Global Pagoda. This is one of the tallest structures in the area and is visible from a distance. Abutting the Global Pagoda, a large water body is created which adds to the peaceful ambience. West of the water body is the large expanse of mangroves. Presently the mangrove growth is sparse and stunted at some spots. A portion of the mangrove area abutting the Global Pagoda can be developed as a Mangrove park which will be an added attraction to the numerous visitors and enhance the peaceful ambience around the Global Pagoda.

Features

- About 345 ha of mangrove to the west of Global Pagoda defined by the creek inlet can be developed as a mangrove park. Tentative boundary is shown in Map No. 22 and 27.
- The area under mangroves will need to be rejuvenated (Refer Section 6.5).
- Limited interventions such as a board walk and a few viewing spots with appropriate sign boards highlighting the features of the mangroves shall only be permitted at a few locations. All interventions shall be subject to CRZ regulations and environmental approvals as may be necessary.
- A detailed study and landscape design plans will have to be prepared. The park can have limited amount of boardwalks, signage to explain the species significance and lighting done in a sensitive manner.

6.4.2.5 Development of Mangrove Board Walk from Gorai Jetty road

(Map No. 27)

Approach

The mangroves towards north of Gorai Jetty road and in Uttan seem to be denser and healthier whereas the mangroves to the south seem to be sparse and have stunted growth. This unique area can be showcased to the tourists via a board walk to create awareness and to provide them an opportunity to experience the mangrove habitat. This would become an important educational tour for children in schools in Mumbai and Mira Bhayander.

Features

- Clearing of minimum amount of mangrove for the boardwalk
- Construction of the board walk through the mangroves in Gorai and Uttan (alignment shown in Map No. 23 in proposed road network).
- This board walk will be of approximately of 2.60 Km long, 1 m wide and raised at a height of 1.5 to 2.00 m from the ground.
- The entry point will be from Gorai Jetty road north of Essel World.
- The board walk will have informative plaques at certain distances highlighting importance of mangroves in Marathi, Hindi and English.
- The boardwalk will culminate at large rectangular deck with limited seating facility.
- Tickets for the boardwalk will be available at the information /amenity center on Gorai Jetty road.
- All the above proposed interventions shall be subject to CRZ regulations and environmental approvals as may be necessary.

Costs

The approximate length is taken as 2.6 km and a running cost of Rs. 2000 per m gives a total cost of Rs. 52 lakhs. This will include about 5 viewing spots and signage.

6.4.2.6 Developing and Operating the Mangrove Boat Ride from Gorai Jetty

(Map No. 27)

Approach

The mangrove area is dissected by various creek inlets which can be strategically used for navigating into the dense mangroves. A boat ride into these creek inlets can be a unique recreational and educational experience for the tourists/visitors/school children. A detailed investigation will have to be made into the kind of boats, capacities of boats, timings dependent on tides etc before operationalizing the initiative.

Features

- Two creek inlets have been identified for boat rides (alignment shown in Map No. 23).
- The boat ride is proposed to begin from Gorai Jetty.
- These may be guided tours through mangroves for a duration of 45 min providing information on mangroves.
- These may not operate during monsoons.
- The boat ride may operate for 8 hours a day with appropriate number of trips.
- Tickets for the boat ride can be made available at the information /amenity center on Gorai Jetty Road.

Revenues

Possible revenue sources

- Entry fees

6.4.2.7 Operating Fish Tours (seasonal)

Approach

The area has 5 goathans located along the coast. These are predominantly fishing settlements with most of the residents belonging to the Koli community. Fishing is one of the important economic activities of the area. Fishing is carried out during 10 months of the year. Fish catch is landed on the fishing beach/jetty at Chowk, Pali, Uttar, Gorai and Manori. The fish is sorted and is transported to the market to be sold. A part of the catch is put along the beach for drying.

This is an activity that can be showcased to the tourists. Tourists can be given a feel of this activity by organizing guided fishing tours including off shore fishing. These tours can culminate at restaurants serving local fish preparations. A detailed investigation will have to be made into the kind of boats, capacities of boats, financial viability etc before operationalizing the initiative.

Features

- The fish tours are proposed to start from Manori Jetty and Chowk Jetty.
- The tickets for these tours can be made available at the Information/facility center at Manori Jetty or Chowk Jetty.
- A fleet of deep sea fishing boats should be sought which have shades, seating, amenities etc.
- Each boat will have a professional fishing guide who will know where to find fish and how to catch.
- The boat will be well equipped – all the required instruments for fishing will be made available for the tourist
- A souvenir photo of tourist with their catch will be given to each tourist.
- Facility for cooking the fish caught will be available on the boat /restaurants in the area.
- Boats in good condition of the local fishermen can be used for this activity. The fishermen can be remunerated as per the number of fishing tours it make in a month.
- Fishermen can register with the organizers of the fishing tours.
- The fishing cooperatives can be encouraged to undertake the fish tours and run the restaurant.

Revenues

Possible revenue sources

- Fishing tour tickets.

6.4.2.8 Designing and Developing Promotional Material for the Area

Approach

Envisioning and developing the area as a major recreation destination will not be adequate. It will have to be supported by a well designed awareness program and promotional material. The tourists visiting the area are only aware of the beaches and resorts and temple in Manori and

Gorai. The area has various other attractions which most of the tourists are not aware of. Besides the existing attractions, awareness about new attractions will have to be created. This will go a long way in getting the tourists to spend longer time here. A wide variety of techniques can be employed..

Features

- Design and print a range of brochures:
 - Tourist Map of all attractions
 - General Information – Tourist sites, activities, resorts etc
 - Heritage Walk
 - Mangrove Garden
 - Mangrove Board Walk
 - Mangrove Boat Ride
 - Trails
 - Fish tour
 - Event calendars – special festivals, events
- Posters, cards, souvenirs.
- Advertisements of special events in the newspapers.
- Install touch screen machines giving information about the area (attractions / stay facilities etc) at various places in Mumbai.
- Design web site specifically giving information about the area and the events.
- Produce short films and advertisements to promote the area.
- Assistance of a professional media agency may be hired to spearhead the effort.

Revenues

Possible revenue sources

- Sale of posters, cards, souvenirs

6.4.2.9 Organizing Special Events (annual, monthly)

Approach

Presently all the tourism activity in the region is of low scale. Most of the visitors visit the area for its beaches and stay for a very short time. Several areas are being proposed for development to attract tourists in the Development Plan. The experience can be enhanced if special cultural events and activities are introduced.

Currently there are no significant events to draw and retain tourists in the area. To make this area a vibrant tourism and recreation area, several interesting activities and events can be organized throughout the year in order to attract people to the area. Some of these can be organized by the local community and resort owners while others can be professionally orchestrated. An event calendar can be prepared for such activities.

Features

- A wide range of activities can be promoted:
 - Cuisine festivals
 - Music festivals
 - Arts and crafts exhibitions
 - Water sports competitions
 - Summer camps for school children and college students during summer vacations
 - Adventure sports events – rock climbing, paragliding, parasailing, water scooter race, boat race etc.
 - Gorai Fair on the lines of Bandra Mount Mary Fair etc
- Can be held during public holidays – Christmas, Diwali, New Year etc

- Can be held in the gothans, in the open spaces adjoining the talavs, open spaces in Green Zone and Tourism Development Zone etc.
- The events can be organized by a multiple set of agencies - resort owners, restaurants, fishing cooperatives, arts and cultural associations etc.

Revenues

The events can be organized in a financially self sustaining manner, through sale of tickets, entry charges, sponsorships etc.

6.5 Environment

6.5.1 Issues and Opportunities

MGU Notified Area has a well preserved landscape with a fragile/sensitive ecological system. The area has more than half of its land under environmental features such as wetlands/mangroves, vegetation, water bodies, hillocks, rocky outcrops and beaches. All of this is sufficiently well preserved due to limited connectivity with Mumbai and the fact that the area is under no development zone as per the current development plans of MCGM and MBMC. Other environmental parameters such as the air quality, water quality is also considerably good. The area being located on the coast, the wind direction is from west to east, this prevents the MGU Notified Area from receiving the polluted air generated by industries or heavy traffic from the main land. Moreover the MGU Notified Area being a no development zone and devoid of any air polluting industry has no major issues pertaining to air pollution.

The problems are showing up in a small way such as encroachments in the mangrove areas, clearing of hill slopes for developing fish drying grounds, etc. Slowly the development is creeping into the area. It is observed that the area is being opened up for development clearly in an unauthorized manner.

There is an existing solid waste dumping site on top of a hillock in Uttan-Pali which is currently under operation. The site has been retained as a reservation on account of non-availability of alternative site in the notified area.

Salt production is happening but in a small way and in the coming years it will be discontinued as the activity is not economically sustainable and does not result in efficient use of land in prime urban areas. It would be appropriate to transform these areas over a period of time in a manner that is environmentally and economically sustainable. There is a huge area of about 36 ha under derelict salt pans in Morva, Dongri and Uttan which can be transformed into an environmental and economic resource for the area.

The development plan for the Notified Area with a focus on tourism and recreational development plan capitalizes on this unique phenomenon and formulates proposals in a comprehensive manner that rejuvenates and preserves this ecosystem. Care is taken to protect and manage the environmental quality and suggest suitable uses of natural resources and also make efforts to enhance and revitalize it.

6.5.2 Proposals

- 1 Regeneration and conservation of mangroves in No Development Zone
- 2 Afforestation on the slopes of the three main ridges
- 3 Development of a botanical garden and nursery at Manori-Gorai
- 4 Environmentally compliant development and management of the existing landfill site at Chowk hillock

- 5 Development of water bodies as passive recreational and green spaces
 - Gorai Junction Talav
 - Vairala Lake
 - Uttan Talav
 - Keshav Shrishti Talav
 - Golconda Talav
 - Dongri Talav
 - Morva Talav

6.5.2.1 Regeneration and Conservation of Mangroves in No Development Zone (Map No. 28)

Approach

Presently about 38% of the MGU Notified area is under wetlands/mangroves. These are very important to the area as mangroves not only stabilize shore, protect from storms and salinity ingress but are also breeding grounds for fishes and various marine organisms. Mangroves also have a socio-religious value attached to them for the local/Koli community as they are breeding grounds for the marine organisms on which their livelihood depends.

The mangrove cover towards north of Gorai Jetty road and in Uttan is denser and healthier whereas the mangroves to the south seems to be sparse and with stunted growth. This can be observed especially in the area between the Manori jetty, Gorai jetty road and the Manori Gorai road. The proposed zoning system is based on a gradation of human interaction with the environment. Therefore minimal human interaction is proposed for the most fragile ecological features such as mangroves, creek inlets and mud flats, limited to passive recreation and conservation and restoration for fragile ecological features.

Features

- Assessment of the depleted area should be done in a scientific manner and the area required to be rejuvenated should be estimated. It is currently estimated at 290 ha, which includes the bald patches categorized as 'marshy' in the existing land use for the MGU Notified Area. About 50% of this area is assumed to be taken up for regeneration. Regeneration will depend on tides, soils etc
- The rejuvenation of mangroves is proposed in an area of 145 ha on priority in Manori and Gorai where the mangrove growth is sparse and stunted.
- Regeneration activity will include
 - Selection of appropriate species
 - Growing of the species / seeds / propagules in a specialized nursery
 - Collection and transportation of seeds and propagules
 - Field Planting
 - Survival and Growth Monitoring
- Ongoing annual monitoring of the mangrove cover
- Proposal at 6.5.2.3 deals with the setting up for nursery and botanical garden. Here the selected species will be produced and made available for planting.
- Local community (fishing) must be involved in planting activity. Monsoon is the lean season for fishing and hence it is the ideal time to undertake planting activity.
- Agencies such as Soonabai Pirojsha Godrej Marine Center / Foundation engaged in such activities can be provided the saplings from the proposed nursery and reimbursed the cost of labour involved in planting.

Costs

The cost of the saplings and costs of planting are calculated. Other costs such as monitoring of the plantation are not considered. It is assumed that these are done by the environmental NGOs and civil societies.

Table No. 6.38: Estimated Cost of Restoration of Mangroves

No	Description	Cost (Rs. Cr.)
1	Cost of 6,52,500 saplings @ Rs. 25 per sapling	1.63
2	labour costs for 33 persons @ Rs. 100/day for 180 days	0.06
	Total	1.69

Assumptions:

1. About 4500 saplings are typically planted in a hectare which works out to an average of 0.45 sapling/sq m. The total area to be regenerated is 145 ha and will need 6,52,500 saplings.
2. Cost of sapling varies from Rs. 5 to 25 / sapling. A bed sapling is Rs. 5 and bag sapling is Rs. 25. Here it is taken as Rs. 25, including the cost of transporting it from the nursery in Uttan.
3. A person can plant 100 to 110 saplings / day covering 200 to 300 sq m. Assuming that 100 saplings will be planted in 250 sq m / person / day the regeneration planting is expected to be completed in 6 months (180 days). This means about 33 labourers will be required for 180 days
4. Daily wage is assumed as Rs 100 / day.

6.5.2.2 Afforestation on the Slopes of the Three Main Ridges (Map No. 28)

Approach

MGU Notified Area has an undulating terrain. This is especially prominent in the northern part of the peninsula. The southern part has local hillocks/ knolls. The three ridges are Chowk, Dongri and Gorai. These are part of the north-south trending western ridge of Mumbai and gently slope towards the coast. The tops of these ridges at places are barren and vegetation on the slopes is also depleting (bare patches are observed). Afforestation on hill slopes will preserve them, make them attractive and bring in fauna.

Features

- Assessment of the depleted area should be done in a scientific manner and the area required to be afforested should be estimated. The area under "hillock with tree cover" in the existing land use distribution for the MGU Notified Area on these ridges works out to about 285 ha. It is assumed that about 40% of this needs to be regenerated which is 114 ha
- Regeneration activity will include
 - Selection of indigenous tree / plant species
 - Growing of the tree / plant species in a specialized nursery
 - Collection and transportation of tree / plant species
 - Planting
 - Survival and Growth Monitoring
- Ongoing annual monitoring of the tree cover
- Proposal No. 6.2.5.3 deals with the setting up a nursery in Uttan where the selected species will be produced and made available for planting.
- Local fishing community must be involved in planting and managing this activity. The lean season for fishing which is the monsoon, is the ideal time to undertake planting activity.
- Special tree planting events can be made as a part of the camps organized in the area. School children brought into the area for environmental education trips can also be involved
- Forest department or MCGM/MBMC can undertake this activity.

Costs

The cost of the saplings and cost of planting are calculated. Other costs such as monitoring of sapling plantation are not considered. It is assumed that this will be done by the Forest Department.

Table No. 6.39: Estimated Cost of Afforestation

No	Description	Cost (Rs. Cr.)
1	Cost of 28,500 saplings @ Rs. 50 per sapling	0.14
2	Labour costs for 32 persons @ Rs. 100/day for 90 days	0.03
	Total	0.17

Assumptions

1. About 100 to 500 saplings can be planted per hectare depending on the type of trees. In this area it is assumed that 250 saplings will be planted per hectare which works out to be 0.025 sapling/sq m. The total area to be afforested is 114 ha and will need 28,500 trees.
2. Cost of sapling varies from Rs. 40 to 60 depending on the species. Here it taken as Rs. 50, including the cost of transporting it from the nursery in Uttan.
3. Labour work for planting will involve digging, weeding, clearing the area etc. A person can plant about 5 to 10 saplings a day. Assuming that 10 saplings will be planted per person per day, the plantation is expected to be completed in 3 months (90 days). This means that about 32 labourers will be required for 90 days.
4. Daily wage is assumed as Rs 100 / day.

6.5.2.3 Development of a Botanical Garden and Nursery in Gorai-Manori (Map No. 28)

With due consideration to the ecological sensitivity of the area, an area of about 65.40 ha in Gorai and Uttan is proposed to be developed as a botanical garden. The proposed garden is intended to create awareness amongst tourists and students about the various exotic plant species and also attract more visitors to the notified area.

The area is huge and can be developed in a variety of ways:

- Nursery for mangroves which will help the process of mangrove rejuvenation
- Nursery for local trees and plants which will help the process of rejuvenation of hillocks and provide plants for landscaping to the resorts/hotels/residents not only in the Notified Area but Mumbai and other areas.
- Nursery for exotic plants, medicinal plants, bonsai etc which can find a market in surrounding areas
- Botanical garden

The features given below are intended to serve as a brief to commission a detailed techno-economic feasibility study for developing the 65.40 ha as a botanical garden and nursery. This will require a team of landscape designers, soil conservation experts, botanists, architects, organizational management and financial experts. Tentatively the components will include:

- Site master plan – areas under various activities / landscape, facilities required etc
- Management and organization structure to run the garden and nursery
- Costs for development and running the place
- Potential revenues

Features

- The entire of 65.40 ha will have to be systematically planned to develop the botanical garden which is larger than the Ooty Botanical Garden in Tamil Nadu in terms of area.
- Botanical garden will have to be landscaped and have different sections on different types of plant species.
- The nursery may be developed to cater to different demand - mangrove saplings, local flora species, exotic species, medicinal plants, fruit plants, etc.

- It could also include green houses and aviaries
- Flower shows, flower exhibitions etc can be organized.
- Educational tours can be organized.
- "Summer/Spring Festivals" can be held each year in the Botanical Garden which can become an added attraction for tourists. Along with these the cultural aspects of the native fishing Koli community can be displayed.
- Restaurants serving food using 'organically' grown ingredients.
- Facilities such as visitor's reception areas, information centers, sale areas, parking, restaurants, rest areas etc. will have to be planned for.
- A detailed techno-economic feasibility study will have to be carried out.
- An independent company / trust or a society can be set up to implement and manage the botanical garden in a financially sustainable manner.

Costs

No costing is done as the implementation of the project depends on various parameters including acquisition of substantial private land

6.5.2.4 Environment compliant development and management of the existing landfill site at Chowk hillock (Map No. 28)

Approach

An integrated solid waste treatment site is being developed by Mira Bhayander Municipal Corporation on the Chowk hill in the Uttan-Pali area. (Uttan – survey no. 25, Pali – survey no. 65). The total designated area is about 22 ha. This site includes composting for biodegradable waste for 50 tons, vermi composting and an integrated solid waste treatment plant for handling 410 tons of waste. Even though the site is not most suitable for the purpose, it is proposed to retain the same as development has already started and as alternate suitable site is also not found in the notified area.

Costs

Since it is an existing site being developed by MBMC, further detailing and costing of the project has not been attempted.

6.5.2.5 Development of Water Bodies as Passive Recreational and Green Spaces (Map No. 28)

- Go rai Junction Talav
- Vairala Lake
- Uttan Talav
- Keshav Shrishti Talav
- Gokonda Talav
- Dongri Talav
- Morva Talav

Approach

MGU Notified Area has numerous water bodies, both natural and manmade. These are quite scenic and can be turned into great recreational spots if the surroundings are well developed. The following two approaches have been adopted to conserve the water bodies while preparing the development plan for MGU Notified Area:

- I. All the water bodies as indicated in the Proposed Land Use Plan, irrespective of the zone in which they fall, shall be retained as water bodies. A 5.0 m. wide riparian buffer zone shall be maintained around the water bodies where no development of any sort shall be permitted.

2. It is proposed to develop 7 water bodies as passive recreational and green spaces. No intensive development and no zone change are permitted in these areas which will disturb the catchment of the talavs.

Gorai Talav

- Gorai talav is located to the south of Gorai Junction along the Manori-Gorai Road.
- It is a significantly large talav, is usually filled during monsoons, and is surrounded by dense vegetation/ trees.
- The water is used for domestic purposes.
- It can be accessed by the Manori Gorai Road and the Gorai Jetty Road abutting the Gorai gaothan and Development Zone 2.

Vairala Talav

- Vairala talav is located in Gorai, near the Vairala church.
- It is usually filled during monsoons, and is surrounded by a large number of mango trees.
- It can be accessed by a small kutchra road.
- Vairala church is listed as a heritage structure (Grade IIA) in a listing carried out by MMRHCS. It was said to be the original church of Gorai, but is in ruins today.
- A lodging facility has been provided by some locals, towards the south east of the lake.

Uttan Talav

- Uttan talav is located in a longitudinal valley, between the elongated ridges of Uttan in the west and Chowk in the east. This is an abandoned quarry site which has turned into a talav.
- The talav is filled all round the year, due to favourable rainfall and centripetal drainage from the ridges. The slopes leading to the lake have a thick vegetation cover.
- It can be accessed by a kutchra road from the Gorai Uttan road.
- A few large institutions are located on the slopes of the ridges near the lake – Ram Ratna Vidya Mandir, Rambhau Mhalgi Prabodini and Keshav Shrishti Prakalp.

Keshav Shristi Talav

- This is a group of 3 talavs located to the north of Keshav Shristi Campus.
- They are formed on account of abandoned quarries.
- They are surrounded by dense vegetation, plantations and cultivation.
- The entire area is delineated as Green Zone and can be accessed by proposed roads from Bhut Bangla Junction and the proposed road around Keshav Shristi.
- The talav is filled all round the year, due to favourable rainfall and centripetal drainage from the ridges. The slopes leading to the lake have thick vegetation cover.

Golconda talav

- This is located opposite to Golconda Hotel along the road leading to Pakhadi.
- It is an elongated talav with a well towards the road.
- It is usually filled during monsoons, and is surrounded by vegetation and cultivation.
- The water is used for domestic purposes and agriculture.

Dongri Talav

- Dongri talav is located behind the Our Lady of Bethlehem church on the Dongri-Manori road.
- The talav can be accessed by the road connecting Dongri Naka with Tarodi gaothan.
- The talav is located in Green Zone and is surrounded by vegetation and cultivation.

Morva Talav

- Morva talav is located in Morva gaothan off the Bhayander-Gorai road.

- The talav is surrounded by houses and vacant fallow land.
- Morva talav is located in Development Zone 2.

Features

- Lands adjoining the 6 talavs have been reserved to be developed as recreational open spaces. The following actions are proposed for developing the area around the talavs:
 - Identification of feeder channels / drains and clearing them
 - Water recharge wells in the lakes to recharge the top aquifer
 - Treatment of the edges - stone pitching, embankments etc
 - Walkways, seating, decks etc
 - Landscaping – soft and hard
 - Lighting
 - Amenities – boating (wherever applicable), amphitheaters (wherever possible) water fountains, restrooms, limited parking (wherever possible) etc
 - Kiosks, wherever required
- The talavs after development can become locations for hosting concerts, cultural events, festivals etc and can be rented out for private functions during limited hours.
- A detailed urban design and landscape design study for developing the 6 talavs will have to be carried out. The study will look at the larger catchment area, prepare master plans, suggest implementation models and estimate detailed costs of development and potential revenues.

Costs

Development costs are schematically estimated. There are two types of costs: development costs for the talavs and the area around the talavs and land acquisition costs.

Table No. 6.40: Estimated Cost of Land Acquisition and Development of Talavs

No	Talav	Area under water body (sq m)	Private Land (sq m)	Land Acquisition Cost (Rs. Cr.)	Dev cost @ Rs. 1000/sq m* (Rs. Cr.)	Total Cost (Rs.Cr.)
1	Gorai	7,638			0.76	0.76
2	Vairala	11,996	11,996	8.88	1.20	10.08
3	Uttan	58,647	58,647	5.28	5.86	11.14
4	Keshav Shrishti, Uttan	34,153	34,153	3.07	3.42	6.49
5	Golconda, Dongri	10905			1.09	1.09
6	Dongri	1,041			0.10	0.10
7	Morva	3,710	3710	0.22	0.37	0.59
	Total	1,28,090	1,08,506	17.45	12.81	30.26

*This cost includes dredging, cleaning of lake, feeder channels and stone pitching at edges.

Revenues

Possible revenue sources:

- Charges for boating in Uttan talav.
- Parking charges
- Rent from event organization

6.6 Water Supply

6.6.1 Issues and Opportunities

The water being supplied to the MGU area is just adequate to meet the current domestic demand. However, water supply will have to be augmented for the additional population expected to be added to the Planning Area by the year 2022 and for non-domestic purposes as well. Further since special tourism and recreational activities are promoted in the Notified Area, there will be a significant demand for water.

Given the peculiar location of the area, its topography and the pattern of development (existing and proposed), centralized solutions for providing water supply are difficult and expensive. It will be difficult to obtain significant water supply from both MCGM and MBMC for tourism and recreational activity as both cities are constrained already. Moreover it is difficult and expensive to expand centralized networks to reach out to faraway places identified for recreation both from the terrain and distance point of view. However, these areas will need water supply. In such a situation the available options are:

- Tapping natural water reservoirs
 - Ground water recharge and withdrawal
 - Rain water harvesting
1. Tapping natural water reservoirs implies collecting water in sufficient quantities in natural reservoirs which can meet the requirements of the area. The area has several water bodies. A quick calculation of the surface area by an average depth of 7.5 m and then accounting for evaporation and seepage losses (by 50%) indicates that about 1.5 MLD water is available which will be required for agriculture and fishing & allied activities. It alone cannot meet the domestic requirements of the area.
 2. Groundwater recharge implies recharging the ground aquifers and withdrawing for consumption. It depends to a large extent on the soil characteristics, aquifers etc. There are not enough studies available in this regard for this area. But primary evidence suggests that potable water in the area is available at depths of 120 to 140 feet in Gorai and at depths of 80 to 100 feet in Manori. Recharge of this upper aquifer is possible. The deeper aquifers would be saline and withdrawal should not be permitted. It is also meaningless to recharge the deep aquifers. However recharge of upper aquifers cannot be proposed at individual owner levels. A detailed analysis of soils will be required on the basis of which prototype recharge structures will have to be developed. Along with the policy for undertaking this and implementation mechanism will have to be thought through. It is difficult to undertake this in dense settlements at individual levels but some systematic intervention from a public agency will have to come forward to undertake scientific recharge in ponds, water bodies etc. It is also impossible to rely entirely on this, demand for other than potable water such as agriculture, fishing, recreation and tourism activities can be augmented.
 3. Surface water harvesting implies harvesting the roof top and ground surface water. This is feasible for larger properties. It is difficult to manage this in the dense gaothans settlements. This is entirely possible in the areas opened up for Tourism Development Zone 2 and Preservation Zone. Such interventions are usually implemented via GDCRs. However again it will have to be based on detailed surveys and a detailed design. A policy for undertaking this and the implementation mechanism will have to be thought through. It can be a public and private initiative but it will have to be monitored.

In the long run all three options should be adopted but this will require an in-depth and scientific study to get refined numbers on the supply - to find out how much water can be tapped. Along

with this, a demand assessment will have to be done for both the domestic and economic activities. At this point only a detailed demand analysis is done for domestic purposes. It is proposed to meet this demand for the plan year by the new Surya Water Supply Scheme. It is also proposed to undertake a detailed study to explore the three source options to reduce / manage the demand in the long run.

6.6.2 Estimation of Water Requirements, 2022

The MGU Notified area will experience natural growth. It is also being positioned and developed as a major tourism and recreation destination with special projects. This will bring in a lot of visitors into the area. The area is expected to see a rise in the number of tourists as well as daily visitors. Development of tourism and recreational activity will also create employment opportunities which are likely to bring in people from the nearby urban areas for jobs. Keeping this in view the water requirements are estimated in the following manner.

Total Water Demand = A (Natural growth of settlements) + B (In migration) + C (Tourist Population)

Natural growth of settlements is the projected population for 2022 and considers births, deaths and natural in/out migration

In-migration of two types is anticipated

1. People coming in on account of opening up of Development Zone 2 in the form of weekend homes for people from Mumbai and other areas) and
2. Migrants coming in on account of the support employment expected to be generated owing to the development of tourism activity

Tourist population of two types is anticipated

1. Resident population in the resorts and hotels
2. Floating population which includes the day visitors and visitors to the camping sites

Water requirements for Essel World and Golden Pagoda are not factored in as they already have their systems in place.

The total requirement of water for the MGU Notified Area is given in the following table.

Table No. 6.41: Summary of Water Requirement for the Notified Area, 2022

Sr. No.	Population Type	Population	Water Requirement			
			MBMC	MCGM	Total	Adding 15% for UFW*
1	Resident Population	74,571	7.67	1.65	9.32	10.72
2	In-migration	9,795	0.61	0.61	1.22	1.41
3	Resident Tourists	4,651	0.12	0.48	0.60	0.70
4	Floating Population	6200	0.02	0.01	0.03	0.04
	Sub-Total	95,217	8.43	2.75	11.18	12.86

The MGU Notified Area will require about 12.86 MLD of water to meet the requirement by 2022. Of this at present, 1.5 MLD is supplied by MCGM and 2.44 MLD is supplied by MBMC. Thus, a total 3.94 MLD is presently supplied. Hence an additional 8.92 MLD needs to be provided by the year 2022.

6.6.3 Proposals

6.6.3.1 Augmentation and Strengthening the Existing Water Supply System Features

- Additional 8.92 MLD or the entire 12.86 MLD water required can be provided from the Surya Water Works which is being developed.
- Strengthen and expand the distribution network – distribution pipes, ESRs, sumps etc. It is quite possible that one may have to relay out the entire network. A detailed feasibility and design study will have to be carried out for the network design.

Costs

Block costs would be as follows:

Table No. 6.42: Estimated Cost of Water Supply System

No.	Description	Quantity (MLD)	Cost (Rs. Cr.)
1	Network @Rs.45 lakh/MLD	1286	5.79
2	ESR capacity taken at 25% of the total water quantity @ Rs 6/liter	321	1.93
3	GSR capacity taken at 50% of the total water quantity @ Rs 3/liter	643	1.93
Total			9.64

The costs would be refined as and when a detailed design is prepared.

6.7 Sewerage

6.7.1 Issues and Opportunities

In the absence of a proper sewerage collection and disposal system there is open defecation, there are open drains carrying untreated sullage into the sea, creeks & mangroves and in general unhygienic conditions giving rise to foul odour at some places. Providing a covered and safe sewerage system is essential in order to develop the area as a high quality recreation and tourism destination. Given the peculiar location of the area, its topography and the pattern of development (existing and proposed), centralized solutions to sewerage are difficult and expensive. However it is possible to provide localized decentralized smaller capacity treatment plants that would be less energy intensive and recycle the treated waste water into water bodies and agricultural activities.

Conventional treatment methods include:

1. Waste stabilization Pond – where land is available. No energy is required for treatment.
2. Oxidation ditches – where sewage flow is comparatively less, more land is not available; but electrical energy is required for treatment process.
3. Mechanically aerated lagoons – where sewage volume is comparatively large, large area of land is not available, power is absolutely required.
4. Activated sludge process – where sewage volume is large, comparatively large area of land required. Power is absolutely required. This method has the highest percentage of sewage treatment, if designed and operated systematically.
5. UASB (up flow anaerobic sludge blanket process) – This is anaerobic treatment carried out in absence of oxygen. Less power required, less percentage of treatment, post-treatment of aerobic system is required before final disposal.

Non conventional treatment methods include:

1. Aquatic Plant Systems

Some of the plant systems are free-floating growths (e.g. duck weeds and hyacinths); while others are rooted vegetations (e.g. reeds); which emerge out of shallow waters. Free – floating growths are required to be harnessed periodically in the built up ponds for waste treatment; such as duck weeds and hyacinth ponds; while reeds are cultivated in constructed wetlands. This system may be considered, if feasible, for the notified area.

2. Land irrigation

Use of treated effluent and sludge for irrigation purposes should be given the fullest consideration in planning any waste disposal scheme. There is a sound logic in returning the solids back to land and re-using the waste water; wherever feasible. This is a successful method of treatment, achieving primary, secondary and tertiary treatment in single operation and in many instances is capable of giving returns in the form of crops and reusable water.

Analyzing the spatial disposition of activities one central network and treatment plant will not be efficient. Since 6 clear clusters of development are evident, 6 decentralized networks and treatment facilities have been proposed. The water will be treated to acceptable levels for agricultural use and diverted into the water bodies. A detailed technical study will have to be commissioned for detailed estimates of capacities, design of drains and treatment plants. A contour survey will have to be carried out for this.

6.7.2 Estimation of Sewage, 2022

The estimated sewerage generation is taken at 80% of the estimated water supply. Looking at the proposed pattern of growth, 6 clear clusters/zones are evident and hence the sewage is estimated for these.

Table No. 6.43: Estimation of Sewage for 2022

No	Development Cluster / Zones	Water Demand (MLD)	Sewerage (80% water demand) (MLD)
1	Morva	0.80	0.64
2	Dongri – Tarodi	1.98	1.59
3	Chowk – Pali – Uttan	6.56	5.25
4	Keshav Shristi	0.70	0.56
5	Gorai Culvem	1.58	1.27
6	Manori	1.23	0.98
	Total	12.86	10.29

6.7.3 Proposals

Designing a decentralized sewerage system and treatment plants

6.7.3.1 Designing a Decentralized Sewerage System and Treatment Plants (Map No.29)

Features

- Six zones have been delineated for collecting sewage
- Sewerage network is proposed for all the six zones and land requirement for the six decentralized treatment plants is as follows:

Table No. 6.44: Estimated Land Requirement for Sewage Treatment Plants

No	Area	Capacity of Proposed Treatment Plant (MLD)	Land Required for STP (sq m)
1	Morva (anaerobic, treated effluent to be let out in the mangroves)	0.64	1,916
2	Dongri – Tarodi (anaerobic, treated effluent to be let out in the mangroves)	1.59	4,764
3	Chowk – Pali (UASB, treated effluent to be let in to the talav behind St Joseph School)	5.25	15,744
4	Keshav Shristi (anaerobic around the Keshav Shristi Talav, treated effluent to be let out in the Talav)	0.56	1,684
5	Gorai Culvem Resorts (anaerobic located close to Culvem Talav, treated effluent to be let in to the Culvem Talav)	1.27	3,798
6	Manori Resorts (anaerobic located close to Manori Talav, treated effluent to be let in to the Manori Talav)	0.98	2,954
Total		10.29	30,861

Wherever possible, government lands have been identified for locating the treatment plants. The details of the land ownership and acquisition costs are as follows:

Table No. 6.45: Estimated Land Acquisition Cost for Sewage Treatment Plants

No	Area/Planning Unit	Govt. land (sq m)	Pvt. Land (sq m)	Total Land (sq m)	Cost of Acquisition (Rs. Cr.)
1	Morva	2,227		2,227	0.00
2	Dongri – Tarodi	4,723		4,723	0.00
3	Chowk – Pali - Uttan		16,838	16,838	1.26
4	Keshav Shristi	1,740		1,740	0.00
5	Gorai Culvem Resorts	2,147	1,714	3,861	1.27
6	Manori Resorts	2,629		2,629	0.00
Total		30,527	18,552	32,018	2.53

Costs

Block costs would be as follows:

Table No. 6.46: Estimated Cost of Sewerage System

No.	Description	Quantity (MLD)	Cost (Rs. Cr.)
1	Network @ Rs. 80 lakhs/MLD	10.29	8.23
2	Cost of the UASB plant @ Rs. 80 lakhs/MLD	5.25	4.20
3	Cost of the anaerobic treatment plants @ Rs. 15000/CUM	5.04	7.56
Sub Total			19.99
4	Land Acquisition Costs		2.53
Total			22.52

The costs would be refined as and when a detailed design is prepared.

Revenues

- Sewerage charges which will emerge from detailed feasibility and design study.
- Raising of water / sewerage charges from the present charges being levied is recommended especially for tourist establishments.

6.8 Solid Waste Management

6.8.1 Issues and Opportunities

Clearly solid waste management is inadequate in MCGM area. Manori and Gorai beaches are the key attractions, a lot of visitors come and a significant amount of waste is generated. The beaches are not regularly cleaned up. Resorts along the beaches usually resort to burning of waste in the open. Informal estimates indicate that about 60% of the waste on the beaches is non-degradable in nature and comprises of items like plastics, cans etc. Further during festivals like Ganpati Visarjan the problem becomes crucial. There is some amount of dumping observed by Essel World in the mangroves and creeks.

Within the MBMC area the waste management system has been privatized, and is far more efficient. On the whole, it is observed that waste is dumped in the creeks and mangroves.

As of now there is no emphasis on segregation of waste in both areas. A new solid waste management site is already being developed in Uttar/Pali atop one of the ridges.

6.8.2 Approach

With the proposed increase in the tourism activity, there is no doubt that the quantities of waste are likely to increase. It is also crucial that there is an emphasis on efficient and sustainable management of waste. Open littering of waste, disposal of waste in creeks / mangroves will not only negatively impact the environment but will also render these areas less attractive for the tourists.

It is important to approach the problem of solid waste management in a 'unified' manner especially since the notified area is ecologically fragile and is being promoted as a recreation / tourism destination. The MGU NA although falls in two different administrative jurisdictions, it has a common development vision, the nature of solid waste management issues is similar (fishing, tourism) within and different from MCGM and MBMC.

It is important to approach the problem of solid waste management in a 'comprehensive' manner – collection of various types of waste (domestic waste, waste from resorts / hotels, hospitals, economic activity), segregation of waste, transportation of waste, treatment of waste and its disposal. For a system that emphasizes segregation, no littering of public places and keeping the area clean, it is important also to spread public awareness about it, put in place sign boards, charge appropriately etc.

A detailed study to estimate the quantities of waste generated, likely mix of wastes, treatment options, implementation, etc. is required. The points below in each proposal are intended to serve as a brief to commission a detailed study on solid waste management in the MGU Notified Area.

6.8.3 Proposals

- 1 Designing a comprehensive and integrated system to manage the solid waste in a sustainable and efficient manner
- 2 Using segregated bins at all public places and recreational areas
- 3 Putting in place sign boards to keep areas clean
- 4 Prohibiting the use of plastic below 20 µ

6.8.3.1 Designing a Comprehensive and Integrated System to Manage the Solid Waste in a Sustainable and Efficient Manner

Features

- The components of the system are segregated collection, transportation, treatment and disposal
- Segregated collection:
 - Door to door segregated collection by workers
 - Waste will be segregated in two containers – biodegradable and non degradable by households, commercial establishments, institutional establishments, hotels/resorts etc
 - Hospitals will have separate containers, this waste is not be mixed with domestic waste
 - Fish markets and allied activities zones to have large segregate collection bins
 - Very large establishments such as Essel World, Golden Pagoda and proposed Amusement Park at Gagangiri to segregate waste and treat the bio-degradable wastes
 - Segregated collection from streets and public / recreational places. All streets and public places to have 3 division bins – plastic, glass/recyclable waste and non degradable waste
- Transportation
 - Waste will be transported in covered dumpers / trucks
 - Optimal routes to be determined on the new proposed road network
- Treatment and Disposal
 - The collected solid waste will be sent to the new solid waste dumping site at Uttan. There are separate facilities for treatment of biodegradable and non biodegradable waste. There is sufficient space to have vermi-culture treatment for biodegradable waste.
- General awareness about the impacts of wastes, benefits of a clean environment etc may be generated through campaigns (print, TV/radio commercials / demonstration exercises / street plays etc) for effective implementation of the system. The system can be operated by a private operator. It is working fairly successfully in case of MBMC. The private operator can be responsible for collection, transportation, disposal of waste and raising awareness amongst the people.

Costs

Since the Solid waste management site is in possession of MBMC and is being developed. Hence, costing of the project is not attempted.

6.8.3.2 Using Segregated Bins at all Public Places and Recreational Areas

Approach

In the proposed integrated solid waste management system emphasis is being laid on segregation of waste. Waste is proposed to be segregated at source in case of door to door collection. In case of public places it is proposed to provide segregated bins that enable segregated disposal.

Features

- Use of special bins with three divisions – one for glass/recyclable wastes; second for biodegradable wastes and the third for non degradable wastes
- Placed at appropriate places – picnic spots, camping sites, recreation zones, talavs etc.
- Conducting awareness campaigns / demonstration regarding advantages of segregated waste collection at source in public places.

Costs

It is not possible to estimate the exact amount of bins required at this point. It will emerge from the detailed solid waste system study for the area. However an adhoc budget can be estimated given an approximate cost of one bin and making a provision for 200 such bins.

Table No. 6.47: Estimated Cost of Segregated Bins

No	Description	Cost (Rs. Cr.)
1	Cost of 200 bins @ Rs. 5000 per bin (based on similar containers available outside India)	1.0
	Total	1.0

Revenues

Possible revenue sources:

- Sponsorships from resorts / hotels
- User charges – costs of this will form a part of the overall cost of the integrated solid waste management system and recovered from the user charges.

6.8.3.3 Sign Boards to keep areas clean

Approach

Sign boards play an important part in raising awareness amongst people and visitors to keep the place clean and prevent littering. In particular, awareness about disposing the waste in a segregated manner needs to be communicated to the people. Presently there is no signage in the area. With this in view, it is proposed to erect signage at appropriate places.

Features

- Signboards designed to be placed at appropriate places – picnic spots, recreation zones, talavs, part of road signage etc
- Design to be in coordination with the overall signage system for the entire MGU Notified Area

Costs

It is not possible to estimate the exact amount of signage at this point. However an adhoc budget is estimated given an approximate cost of one sign and making a provision for 250 such signs.

Table No.6.48: Estimated Cost of Sign Boards

No	Description	Cost (Rs. Cr.)
1	Cost of 250 sign boards (0.6 m dia.) @ Rs. 1500 per board. (Paint on metal, inclusive of fixing)	0.05
	Total	0.05

6.9 Economic Development

6.9.1 Issues and Opportunities

Fishing is the chief occupation and major source of income for the local residents (koli community) and hence is an important activity. The fish catch in the area is significant and meets the demand of the markets of Mumbai and Mira Bhayander. It is important that Fishing be promoted as a sustainable activity that can also be showcased and turned into an attraction for the visitors.

Fishing and related activity such as fish drying, net repairing equipment storing boat making and repairing require large areas. Presently there is a shortage of area for such activities. The availability of ice is also limited as there is only one ice factory in the area and no facility for cold storage. Moreover this is a seasonal activity and does not provide employment throughout the year. It can be supported by increasing areas for it in the plan, facilitating the provision of facilities

such as cold storages, markets, processing units which could add value and generate employment for a longer period of the year.

Agriculture will be difficult to sustain in the times to come as the land values are going up on account of the increasing demand for development from Mumbai and Mira Bhayander. It will continue to be practiced for some time and till then some efforts will have to be made to introduce high value added crops and diversification into floriculture, horticulture and associated processing activity to make it economically viable and preserve the ecological balance of the area.

Salt is produced but in a small way and in the coming years it will be discontinued as the activity is not economically sustainable and does not result in efficient use of land in prime urban areas. It would be appropriate to transform these areas over a period of time in a manner that is environmentally and economically sustainable as per the relevant statutory provisions such CRZ regulations.

Tourism is separately dealt with in Section 6.4.

The Development Plan through regulatory proposals, increased connectivity and reserving land for specific activities can facilitate the economic activity. Other initiatives will have to be taken up simultaneously by concerned agencies to give an impetus to the economic development. Considering these issues and opportunities, 4 proposals are suggested:

6.9.2 Proposals

- 1 Delineation of Fishing and Allied Activities Zone
- 2 Allocation of land for cold storage facility, fish processing unit and fish market at Pali
- 3 Promotion of floriculture, vegetable farming, high value added crops and green houses in the Green Zone
- 4 Promotion of home-based fish and vegetable pickling activity

6.9.2.1 Delineation of Fishing and Allied Activities Zone (Map No. 30)

Approach

There are large fish drying grounds in Manori-Culvem and Gorai along the coast. In Uttan and Pali, they are found along the beach and in Chowk, the rocky surfaces have been cut and surfaced with concrete to create fish drying grounds. These have developed organically and are crucial for allied activities such as fish sorting, cleaning boat repairing, net repairing etc. There are temporary bamboo structures for storing nets and other equipment. The consultations with cooperatives revealed that currently the fish drying was done on the land that was available and convenient. This also included government land which has been used for generations. Fishing is the predominant source of livelihood of the people in the notified area. Hence with a view to protect and develop fishing as an activity, a special zone has been demarcated in the development plan.

Features

- The Fishing & Allied Activities Zone is demarcated on the existing fish drying grounds along the coast in Chowk, Uttan, Gorai and Manori-Culvem usually including some space for expansion.
- The details of the locations of these zones is as follows:

Table No. 6.49: Village wise area of Fishing and Allied Activities Zone

No.	Village/ Planning Unit	Area (Ha)
1	Manori	18.45
2	Gorai	0.00
3	Uttan	5.76
4	Pali	0.31
5	Chowk	4.11

No.	Village / Planning Unit	Area (Ha)
6	Dongri	0.00
7	Tarodi	0.00
8	Morva	0.00
Total		28.63

- Walking tours are proposed through these areas for the tourists and visitors which will give a glimpse of fishing activities (refer Section 6.4).

6.9.2.2 Allocation of Land for Cold Storage Facility, Fish Processing Unit and Fish Market at Pali

(Also Refer Section 6.3.2.5 under Social Infrastructure and Amenities)

Approach

A key input to promoting the fishing activity in the area is provision of cold storages, small processing units and markets as there is a dearth of such facilities in an organized manner. There are no cold storage facilities and only one ice factory in Uttan, which supplies ice to the entire area. The ice from this factory is not sufficient hence the fish has to be sent directly to the market. Therefore it cannot be stored, sold or used at a later time and the scale of fishing cannot be expanded. The fish catch is directly exported out of the area. A limited amount of processing in terms of small scale units for packaging and pickling can be provided and would boost the local economy and employment. A large site is identified in Uttan and Pali close to the creek and with good road connectivity of about 1.83 ha. Since it a fairly large site it is proposed to have cold storage facilities, small fish processing units and have fish market to facilitate trading.

Features

- A proportionate mix of the three activities – cold storage facilities, fish processing units and fish market- will have to be arrived at on the basis of market requirements.
- It is expected that the land is purchased by the fishing cooperatives to develop the facilities or a developer can develop the facilities, manage them, rent them and collect rents.

6.9.2.3 Promotion of Floriculture, Vegetable Farming, High Value added Crops and Green Houses in the Green Zone

Approach

Agriculture is the second largest employment generator in the area. Currently 18.99% of the total area is under cultivated or fallow lands. It is important to maintain the green cover in this area to retain the ecological character. For this it is crucial that agriculture is made financially viable through diversification such as horticulture, vegetables, floriculture, and high value added crops, green houses etc. However this transformation will have to be systematically facilitated.

Features

- Information, techniques about horticulture, floriculture, high value crops, green houses etc will have to be disseminated
- There will be requirements for infrastructure, drip irrigation, research on soil productivity for certain crops/plants varieties, training, post harvesting facilities etc will have to be assessed and provided for.
- Further Keshav Srishti located in Uttan which conducts research on agriculture can be made as a nodal agency for this activity. Its capacity will have to be increased to become the nodal agency in the introduction and implementation of horticultural cultivation in the area including training of farmers, marketing etc. The National Horticultural Mission can be approached for grants for expansion and initial training of the staff at Keshav Srishti.

6.9.2.4 Promotion of Home-based Fish and Vegetable Pickling Activity

Approach

Currently the women in the fishing settlements are involved in the fish drying and sorting activity. In order to include women in the tourism development plan and enable them to benefit from tourism activities, promotion of home based economic activities such as fish and vegetable pickle making and artifacts making are proposed. The fish and vegetable pickles can be marketed as the delicacies of the area. These can be marketed / sold in the resorts, hotels, amenity centers etc. A parallel can be drawn from Goa where pickling as an activity which naturally arose in the wake of tourism.

Features

- The activity will largely be home based. Women will have to be encouraged into this activity apart from fish drying and sorting.
- Marketing cooperatives can be setup or the activities of the fishing cooperative can be expanded.
- The women will have to be organized into cooperatives to coordinate and manage marketing of the pickling activity. They will require training in managing / organizing the activity, packaging and marketing.
- Products can be put on shelves in resorts, hotels, amenity centers, local stores etc.

6.10 Reservations for Public Purpose

6.10.1 Master List of All Reservations

The table below gives the complete list of all reservations in the development plan, the status of ownership, amount of land to be appropriated from each plot and the cost of acquisition.

Table No. 6.50: List of Reservations by Survey Numbers, Land Ownership and proposed land use in which the reservation is located

Res. No.	Name of Reservation	Village	Details			Area in sq. m.			PLU Zone	
			Owner-ship	S No / CTS No.	Area(sq m)	Govt	Pvt.	Total		
1	Chimaji Appa Memorial Park	Chowk	Govt	7pt	40,374	43,200		43,200	TDZ	
				21pt	2,826					
				Subtotal	43,200					
2	Boat Repair Workshop	Chowk	Govt	7 pt	398	2,200		2,200	D2	
				Chowk Gaothan	1,802					
				Subtotal	2,200					
3	Burial Ground / Crematorium	Chowk	Govt	7pt	10,299	10,299		10,299	GZ	
7	Playground	Pali	Govt	16pt	3,818	3,818		3,818	D2	
8	Cold Storage Facility, Fish Processing Unit & Fish Market	Pali	Private	Govt	78 pt	2,759	2,759	15,582	18,341	D2
				48pt	901					
				51pt	750					
				74pt	8,930					
				75pt	1,708					
				77pt	2,582					
Uttan	Private	43pt	713							
				Subtotal	15,582					
9	Disp. & Maternity Home	Uttan	Govt	284pt	1,903	1,903		1,903	D2	
10	Secondary School	Uttan	Private	48 pt	3,393		3,393	3,393	D2	
11	Playground	Uttan	Private	47pt, 0pt & 64pt	2,304		2,304	2,304	D2	
12	Primary School	Uttan	Private	49pt & 62	2,534		2,534	2,534	D2	

Res No.	Name of Reservation	Village	Details			Area in sq. m.			PLU Zone
			Owner -ship	S No / CTS No.	Area (sq m)	Govt.	Pvt	Total	
				pt					
13	Playground	Uttan	Private	49pt & 64 pt	2,660		2,660	2,660	D2
14	Burial Ground/ Crematorium	Uttan	Govt.	Uttan Gachan	1,530	1,530		1,530	D2
17	Primary School	Uttan	Govt.	289pt	2,800	2,800		2,800	D2
18	Playground	Uttan	Govt.	289pt	3,484	3,484		3,484	D2
20	Slaughter House	Uttan	Private	282pt	3,673		3,673	3,673	GZ
21	Golconda Talav and Garden	Dongri	Govt.	38pt	4,099	17,371	3,148	20,519	GZ
				45pt	2,367				
				Talav	10,905				
				Subtotal	17,371				
			Private	37pt	205				
				46pt	1,457				
				47pt	1,486				
Subtotal	3,148								
22	Primary & Sec. School	Dongri	Private	81pt	4,480		4,480	4,480	D2
23	Playground	Dongri	Private	76pt	3,645		3,645	3,645	D2
24	Dongri Talav & Garden	Dongri	Govt.	Talav	1,042	2,231		2,231	D2
				79	841				
				78pt	348				
				Subtotal	2,231				
25	Primary & Secondary Schod	Tarodi	Private	1pt	546	1,846	1,846	1,846	D2
				43pt	1300				
				Subtotal	1,846				
26	Playground	Tarodi	Private	1pt	3,074	3,096	3,096	3,096	D2
				4 pt	22				
				Subtotal	3,096				
28	Secondary Schod	Morva	Private	3pt	1,470		1,470	1,470	D2
29 30	Playground Morva Talav and Garden	Morva Morva	Private	3pt	1,550	8,968	8,968	8,968	D2 D2
				4pt	480				
				3pt	2,635				
				4pt	908				
				11pt	978				
				14pt	239				
				Talav	3,710				
				Subtotal	8,968				
32	Keshav Shrishti Talav and Garden	Uttan	Govt.	130pt	2,501	10,182			GZ
				300pt	7,681				
				Subtotal	10,182				
			Private	126pt	8147				
				127pt	5248				
128pt	7968								

Res. No.	Name of Reservation	Village	Details			Area in sq. m.			PLU Zone		
			Owner -ship	S No / CTS No.	Area(sq m)	Govt	Pvt.	Total			
				129pt	6577						
				131pt	445						
				132pt	1187						
				144pt	10747						
				146pt	729						
				147pt	5444						
				148pt	5919						
				150pt	927						
				152pt	4148						
				175pt	1749						
				300pt	15706						
				Talav	34153						
				Subtotal	1,09,094	10,182	1,09,094	1,19,276			
33	Uttan Talav and Garden	Uttan	Govt	221/6pt	581				GZ		
				351pt	12,515						
				Subtotal	13,096						
				200pt	4,469						
				218	3,034						
				215/32	3,734						
				215/34	819						
				215/35	3,476						
				220	7,146						
				221/1	611						
				221/2	487						
				221/3	531						
			221/4	1,053							
			221/5	435							
			221/6	581							
			221/7	1,426							
			221/8	558							
			221/9	450							
			221/10	186							
			221/11	108							
			221/12	304							
			221/13	243							
			222	5,863							
	223pt	12,646									
	224pt	8,960									
	Talav	58,647									
		Subtotal		1,15,767		13,096	1,15,767	1,28,863			
34	Bus Depot	Gorā	Govt	88pt	11,397				TDZ		
			Private	159pt	573						

Res No.	Name of Reservation	Village	Details			Area in sq. m.			PLU Zone
			Owner -ship	S No / CTS No.	Area (sq m)	Govt.	Pvt	Total	
				Subtotal	11,970	11,397	573	11,970	
35	Vairala Talav and Garden	Gorai	Govt.	325pt	99				GZ
				384pt	116				
				Road	35				
				Subtotal	250				
			Private	323pt	19				
				324	291				
				379pt	973				
				383pt	1,588				
				386	122				
				387	197				
				388pt	1,963				
				400	113				
				401pt	646				
				403pt	215				
				404pt	489				
405pt	6								
761pt	798								
Talav	11996								
Subtotal	19,416	250	19,416	19,666					
36	Parking lot	Gorai	Private	1641	1,997				GZ
				1642	2,173				
				Subtotal	4,170				
38	Gorai Junction Talav	Gorai	Private	1604pt	1,545				GZ
				1608pt	453				
			Govt.	Talav	7638				
39	Burial Gd/Crematorium	Gorai	Private	1073pt	2,747		2,747	2,747	TDZ
41	Playground	Manori	Govt.	717pt	5,564	5,564		5,564	D1
42	Secondary Schod	Manori	Govt.	717pt	3,987	3,987		3,987	D1
43	Hospital	Manori	Govt.	981pt	4,682	4,682		4,682	D1
44	Burial Gd/ Crematorium	Manori	Private	21pt	1,908		1,908	1,908	D2
48	Parking lot	Manori	Govt.	717pt	4,030	4,030		4,030	TDZ
50	Play Ground	Manori	Govt.	1731pt	553				D2
				1718pt	911				
			Private	1723pt	105				
				1724	213				
				2424pt	46				
				1727pt	209				
				1729	154				
				1732pt	126				
1730pt	905								

Res. No.	Name of Reservation	Village	Details			Area in sq. m.			PLU Zone		
			Owner-ship	S No / CTS No.	Area(sq m)	Govt	Pvt.	Total			
				1733pt	306						
				1734pt	25						
				road	199						
				Subtotal	3,199	553	3,199	3,752			
52	Burial Gd/Crematorium	Manori	Private	2452	3,705		3,705	3,705	D2		
53	Play Ground, Recreational Amenities, Parking	Manori	Govt.	2457pt	5,769	17,995	3,856	21,851	D2		
				2459pt	2,857						
				2460pt	7,506						
				2458	1,863						
				Subtotal	17,995						
			Private	2453pt	1,858						
				2454pt	624						
				2455pt	1,374						
Subtotal	3,856										
54	Playground	Manori	Private	2937pt	2,269		2,269	2,269	D2		
58	Tourist Amenity Centre	Manori	Private	3181pt	1,300		1,300	1,300	TDZ		
59	Tourist Amenity Centre	Gori	Govt.	1880pt	1,334	1,334		1,334	GZ		
60	Sewage Treatment Plant	Morva	Govt.	58pt	2,227	2,227		2,227	D2		
61	Sewage Treatment Plant	Dongri	Govt.	5pt	1,955	4,723		4,723	D2		
				4pt	2,735						
				3pt	33						
				Subtotal	4,723						
62	Sewage Treatment Plant	Uttan	Govt.	130pt	1,740	1,740		1,740	D1		
63	Sewage Treatment Plant	Uttan	Private	73	11934	16,838		16,838	GZ		
				74pt	3,652						
				Road	1,252						
				Subtotal	16,838						
64	Sewage Treatment Plant	Manori	Govt.	604pt	2147	2,147	1,714	3,861	D1		
				605pt	461						
				606pt	1253						
				Subtotal	3861						
65	Sewage Treatment Plant	Manori	Govt.	2977pt	2,629	2,629		2,629	GZ		
66	Parking lot	Gori	Private	1916pt	125	4,021		4,021	TDZ		
				1917pt	3,896						
				Subtotal	4,021						
67	Parking lot	Gori	Private	1919pt	1,716	5,670		5,670	TDZ		
				1920pt	271						
				1921pt	3,312						
				1922	164						
				1926pt	207						
				Subtotal	5,670						
68	Columnar Basalt	Chowk	Govt.	7pt	1,818				GZ		

Res No.	Name of Reservation	Village	Details			Area in sq. m.			PLU Zone
			Owner -ship	S No / CTS No.	Area (sq m)	Govt.	Pvt	Total	
	Viewing Spct			2pt	682				
				Subtotal	2,500	2,500		2,500	
69	Solid waste land-fill site	Pali	Govt.	65 (48)	1,09,059				PZ
		Uttan	Govt.	25pt	1,11,195	2,20,254		2,20,254	
70	Education and Training Centre	Manori	Govt.	981pt	2,658	2,658		2,658	D1
71	Police Post	Manori	Govt.	2977pt	500	500		500	GZ
72	Parking lot	Gorai	Govt.	88pt	11,067	11,067		11,067	TDZ
73	Bus Depot	Uttan	Govt.	316Bpt	945				D1
				93pt	391				
				319B	696				
				92pt	291				
		Private		11pt	3,719				
				10pt	3,049				
				319pt	2,591				
				Subtotal	10,737	945	10,737	11,682	
74	College/Training Center	Uttan	Govt.	201pt	5,729	5,729		5,729	D1
75	Police Station	Uttan	Govt.	316Bpt	1,205	1,205		1,205	D1
76	Tourist Amenity Centre	Dongri	Govt.	2pt	1,011	1,011		1,011	D2
77	Police Post	Dongri	Govt.	2pt	303	303		303	D2
78	Public Playground	Gorai	Govt.	88pt	30,344	30,344		30,344	TDZ
79	Municipal Office	Uttan	Govt.	201pt	5,067	5,067		5,067	D1
80	Fire Station	Uttan	Govt.	201pt	4,439	4,439		4,439	D1
81	Municipal Office & Garden	Gorai	Govt.	88pt	8,932	8,932		8,932	TDZ
82	Police Station	Gorai	Govt.	88pt	6,861	6,861		6,861	TDZ
83	Judicial Academy	Uttan	Govt.	351pt	13,886	13,886		13,886	D1
84	Tourist Amenity Centre	Gorai	Govt.	1pt	2,532	2,532		2,532	TDZ
85	Tourist Amenity Centre	Gorai	Private	1071pt	1,783	1,783		1,783	TDZ
86	Primary Secondary Schod & Playground	Gorai	Private	1588pt	7,380	7,380		7,380	GZ
87	Secondary Schod	Gorai	Private	418 pt	1,934				GZ
				419	608				
				430	449				
				429pt	21				
				424pt	270				
				370 pt	435				
				Subtotal	3,717		3,717	3,717	
88	Playground	Manori	Govt.	313 pt	133				
			Private	420	580				
				421pt	126				
				422 pt	678				
				424 pt	1,925				
				429 pt	42				

Res. No.	Name of Reservation	Village	Details			Area in sq. m.			PLU Zone
			Owner -ship	S No / CTS No.	Area (sq m)	Govt	Pvt.	Total	
				428 pt	27				
				427 pt	54				
				426pt	43				
				Subtotal	3,475	133	3,475	3,608	
89	Tourist Amenity Centre	Mancari	Govt	717pt	3,229	3,229		3,229	TDZ
90	Tourist Amenity Centre	Mancari	Govt	1055 pt	1,297	1,297		1,297	TDZ
	Total					5,17,824	3,74,523	8,92,347	

* PLU Zones - GZ - Green Zone;
 FAZ - Fishing and Allied Activities Zone;
 TDZ - Tourism Development Zone;
 D1 - Development Zone;
 D2 - Development Zone 2.

7. Financing and Implementation of the Plan

This chapter summarizes the costs of implementing the Development Plan for the MGU Notified Area, possible sources of revenue, tentative implementation mechanism and a summary of benefits.

Summary acquisition of the entire notified area is not proposed in the plan. However, it is proposed to acquire the lands:

- a) Earmarked for public reservations,
- b) Earmarked for transportation and
- c) Required for implementation of special projects identified in the plan that will catalyse tourism development in the notified area, but excluding those already developed or acquired or in government ownership or those that are expected to be developed through private sector involvement.

The alternative mechanisms considered for acquiring these lands are a) Land Acquisition, b) grant of Transferable Development Rights (TDR), and c) swapping with nearby Government lands.

It is proposed to get transferred free of cost to the Planning Authority, all the lands held under government ownership and under the ownership of other public agencies so that the same can act as revenue generator for financing the infrastructure development in the notified area to be used for swapping with private lands where acquisition of private lands for vital infrastructure is necessary and for realizing public reservations thereon.

7.1 Plan Implementation Costs

7.1.1 Introduction

In the description of the proposals and initiatives in Chapter-6 of this report, effort is made to estimate costs wherever possible. However, implementation would depend on the priorities, feasibility and availability of resources. Some initiatives proposed, would require detailed feasibility studies or further investigation. In such projects the key features listed under each serve as a brief/guidance for further detailed work. In this chapter an estimate of proposals made has been made which seem imperative in the immediate future for the development of the area. The Plan implementation consists of two types of costs: a) land acquisition cost and b) development cost, the details of which are discussed below.

Land Acquisition Costs

A major concern for implementation is the acquisition of land required. Acquisition of lands for public purpose imposes a responsibility on the SPA and is subject to acquisition within a period of 10 years from the sanction of the development plan. In the Development Plan for the MGU Notified Area this concern was important and hence an effort was made to locate most of the amenities on government lands wherever suitable. After that the total private land that needs to be acquired is estimated. A major portion of this can be reduced by mechanisms such as TDR and allocating government land in lieu of the plots surrendered. These are briefly described below:

I Grant of TDR

TDR is an option to the landowner and can be generated from the land required for reservations and transportation. It can be consumed in Green Zone, Tourism Development Zone and the Development Zones-1 & 2. The practices prevailing in MCGM for grant of TDR are proposed to be followed in the Notified area.

2 Allocation of govt. plots in alternative locations in lieu of land (land swapping)

The MGU Notified area has significant amount of land under government ownership. It is proposed that if a particular land is required for a reservation and if government land is available close by then the owner can be allocated that land in return. This strategy can be adopted on a case by case basis for the reservations.

3 Land acquisition

In some instances, private land may have to be acquired under relevant legislation as mentioned in para-1 of this Chapter.

Development Costs

Cost of construction/developments are estimated on the basis of prevailing rates in 2011. Sections 6.2 to 6.9 have detailed out the estimated costs and the same are compiled hereunder.

7.1.2 Summary of Costs

Table 7.1: Summary of Costs

No.	Description	Land Acquisition Cost (Rs. Cr.)	Development Cost (Rs. Cr.)	Total Cost (Rs. Cr.)
A	Road Network and Transportation	297.44	650.55	947.99
B	Social Infrastructure and Amenities	10.44	53.38	63.82
C	Environment (Botanical garden, trees, mangroves etc)	17.23	0.08	1.33
D	Water Supply	0.00	9.64	9.64
E	Sewerage	0.63	19.99	20.62
F	Solid Waste Management	0.00	1.05	1.05
Total		88.37	726.90	815.27
5% Administrative Costs on Development Cost			36.35	
Grand Total				851.61

Assumptions:

- The cost of private land acquisition for transportation and reservations is considered as 25% as 75% of the lands are proposed to be acquired by grant of TDR or swapping with nearby government lands.
- Development costs of Bus Depots, Police Stations, Municipal Offices, Slaughter House is expected to be undertaken by the respective authorities/agencies and therefore is not included in the plan implementation cost.
- Two bridges across Manori creek, one at Gorai and the other at Manori as shown in Greater Mumbai's Development Plan, are proposed to be retained. However, considering that these links will enhance the regional connectivity, the costing for the same is not included in the plan implementation cost.
- 5% administrative costs are added only on development costs.

7.1.3 Detailed Costs

The costs in Table 7.2 below are based on costs calculated in the section 6.2 to 6.9 of Chapter-6 of this report.

Table 7.2: Detailed Costs

No	Description	Land Acquisition cost* (Rs. Cr.)	Development cost (Rs. Cr.)	Total Cost (Rs. Cr.)
A	Road Network & Transportation	297.44	650.55	947.99
	1 Preparation of a structure plan for road network and transportation			
	New Links	45.07	391.01	436.08
	Road widening	25.11	219.75	244.86
	Junction improvement	0.00	1.58	1.58
	Pedestrian trails	4.50	16.18	20.68
	Parking lots & Bus Depots	2.61	0.00	2.61
	Sub Total	77.29	628.53	705.82
	2 Refurbishment of the existing jetties			
	Refurbishment of Existing Jetties	0.00	0.69	0.69
B	Social Infrastructure and Amenities	10.44	53.38	63.82
	1 Education Facilities	1.01	25.61	26.62
	2 Health Facilities	0.00	5.95	5.95
	3 Recreation and Open Spaces	7.56	13.26	20.82
	4 Burial Grounds/ Crematoria	1.55	3.04	4.59
	5 Tourists Amenity Centers	0.24	4.19	4.43
	6 Fire Station	0.08	1.33	1.41
C	Environment	17.23	0.08	1.33
	1 Regeneration & Conservation of Mangroves in No Devp. Zone	0.00	1.69	1.69
	2 Afforestation on the three main ridges	0.00	0.17	0.17
	3 Development of 6 Water Bodies	17.23	12.44	16.75
D	Water Supply	0.00	9.64	9.64
	1 Augmentation and strengthening the existing water supply system	0.00	9.64	9.64
E	Sewerage	0.63	19.99	20.62
	1 Developing a decentralized sewerage system and treatment plants	0.63	19.99	20.62
F	Solid Waste Management	0.00	1.05	1.05
	1 Providing segregated bins and sign boards	0.00	1.05	1.05
	Total	88.37	726.90	815.27
	5% Admn. Cost on Development Cost		36.35	
	Grand Total			851.61

* Only 25% of the estimated cost of Land Acquisition is considered in Table-7.1 as 75% of the lands are proposed to be acquired by grant of TDR or swapping with nearby government lands.

7.2 Revenues

7.2.1 Introduction

Most of the projects proposed in the Plan do not individually generate revenues. However, some have revenue generation potential. Part of the cost of implementing the plan will be met by levying charges on the development that will occur in the area. The available instruments for the same are:

1 Development Charges

The MR&TP Act, 1966 empowers the Planning Authority to levy development charges while granting the development permissions based on property values as per the recent amendment to the MR&TP Act, 1966. The amendment requires a minimum rate of 0.5% for development and 2.0% for construction on the Ready Reckoner value for residential development; and doubling of the same for commercial use. Table-7.5 shows the calculations made in this regard.

2 Premium from Grant of Additional FSI

On the base FSI prescribed for zones 'G' and 'D1', a further FSI as mentioned in Table-6.4 can be allowed on payment of premium or by purchasing TDR. The potential for generation of this FSI and the potential consumption by Premium FSI and TDR respectively are worked out as given in Table-7.4.

3 Lease of Government Land

This can be a very important resource of revenue in the MGU Notified Area as large areas are under government ownership, free from CRZ. However, their current availability for transfer to SPA and consequent leasing is to be carefully examined. Based on certain assumptions in this direction, broad estimation of revenue generation is made in Table 7.4.

For carrying out the above exercise, a number of assumptions with respect to the land-use within each use-zone and developability of land are made. The same are indicated in Tables-7.4 and 7.5. The summary of revenues from Table-7.6 shows that from the above three sources, an amount of Rs. 876.87 Cr. can be generated as against the requirement of Rs 863.74 Cr. presented in Table-7.2.

7.2.2 Summary of Revenues

From the sources listed above, revenue generation is estimated at current prices/values. The detailed calculation of the same is given in Tables 7.3 to 7.6 below:

Table 7.3: Areas of various Land-Use Zones proposed in the Plan

Name of the village	Total Area in Ha. proposed in Zone			
	G	TDZ	D1	D2
Manori - Culvem	258.16	98.72	19.84	36.20
Gorai	376.90	175.41	0.00	13.09
Uttan	394.28	28.96	167.07	73.42
Pali	40.31	2.32	0.00	50.70
Chowk	153.24	2.79	0.00	25.85
Tarodi	30.17	0.00	0.00	17.65
Dongri	154.20	0.00	13.19	33.29
Morva	27.92	0.00	0.00	26.66
Total land Area in Ha	1435.17	308.20	200.10	276.85

Table 7.4: Consumption Base of additional FSI

No	Land-Use Zone	Area in Ha.	Developable area @	Consumption base @	Area in Ha. to consume addl FSI	Max. addl.FSI admissible	Expected consumption of Premium FSI		Balance potential for Consumption of TDR	
							Add. FSI	BUA	Addl.FSI	BUA
1	2	3	4	5	6 (3*4*5)	7	8	9 (6*8)	10 (7-8)	11 (6*10)
1	G	1435.17	30%	100%	430.55	0.1	0.075	32.29	0.025	10.76
2	DI	200.1	60%	60%	72.04	0.2	0.15	10.81	0.050	3.60
	Total	1635.27			502.59			43.10		14.37

Assumptions for further calculations:

- 51.76 ha. of BUA will be consumed by purchasing Premium FSI
- 24.35 ha. of BUA will be consumed by utilizing TDR
- 18.86 ha. of BUA will remain unutilized (43.21-24.35)

Table 7.5: Generation and Consumption of TDR and Premium FSI

I	TDR generation from Roads & Reservations	
A	Area of new road links, widening & pedestrian trails on private land in Ha. @ 67% of total area (65.05+40.71+6.47)	75.19
B	TDR generated in Ha. @ avg 0.3 FSI	22.56
C	Area of reservations on private land in Ha. (actual)	37.45
D	TDR generated in Ha. @ avg 0.30 FSI	11.23
E	Total TDR generated in Ha. (B+D)	33.79
II	Revenue from sale of premium FSI	
a	Additional FSI receiving zones	G & DI
b	Total FSI receiving capacity of G & DI zones in Ha. (From Table 7.4)	57.46
c	TDR demand at 75% of generation in Ha. as in I (E) above	25.34
d	Land in Ha. to be acquired by way of TDR as per formula at (I) above	84.48
e	Land in Ha. to be acquired by way of monetary compensation (A+C-d)	28.16
f	Potential BUA in Ha. to be consumed by purchase of Premium FSI as per Table 7.4	43.10
g	Revenue generation from Premium charged on addl. FSI @ Rs. 10,000 per sq.mt. (average cost of built-up residential area in Gorai as per Ready Reckoner)	430.97
III	Lease of Government Land	
1	Total Government land	2295.64
2	Usable/buildable/saleable Govt. land @ 8%	183.65
3	Usable Govt. land after deducting 75 Ha. of MTDC (excluding reservations)	108.65
4	Govt. land under reservations (existing and proposed)	51.78
5	Balance usable Govt. land available for lease	56.87
6	Saleable Govt. land already used/encroached/allotted @ 40%	22.75
7	Net balance Govt land available for lease	34.12
8	Premium on lease @ Rs 10,000 (Avg land rate as per Ready Reckoner)	341.22

Table-7.6: Calculation of Revenue through Development Charges

Village	A. Net Buildable Land Area in Ha.				Net Area (Commercial) in Ha. as % of A				Net Area (Residential/Instt.) in Ha. as % of A				Total
	GZ	TDZ	D1	D2	GZ	TDZ	D1	D2	GZ	TDZ	D1	D2	
	@ 30%	@ 60%	@70%of 60%	@50%of 75%	@ 40% C	@ 90% C	@ 20% C	@ 10% C	@ 60% RI	@ 10% RI	@ 80% RI	@ 90% RI	
Manori - Culvem	77.45	59.23	8.33	13.58	30.98	533.1	1.67	1.36	46.47	5.92	6.67	12.22	158.59
Gorai	113.07	105.25	0.00	4.91	45.23	94.72	0.00	0.49	67.84	105.2	0.00	4.42	223.22
Uttan	118.28	17.38	70.17	27.53	47.31	15.64	14.03	2.75	70.97	1.74	56.14	24.78	233.36
Pali	12.09	1.39	0.00	19.01	4.84	1.25	0.00	1.90	7.26	0.14	0.00	17.11	32.50
Chowk	45.97	1.67	0.00	9.69	18.39	1.51	0.00	0.97	27.58	0.17	0.00	8.72	57.34
Tarodi	9.05	0.00	0.00	6.62	3.62	0.00	0.00	0.66	5.43	0.00	0.00	5.96	15.67
Dongri	46.26	0.00	5.54	12.48	18.50	0.00	1.11	1.25	27.76	0.00	4.43	11.24	64.28
Morva	8.38	0.00	0.00	10.00	3.35	0.00	0.00	1.00	5.03	0.00	0.00	9.00	18.37
Total max. Buildable Area	430.55	184.92	84.04	103.82	172.22	166.43	16.81	10.38	258.33	18.49	67.23	93.44	803.34
Village	B. Max. Built-up area with respective FSI in Ha.				Buildable area (Commercial) in Ha. as % of B				Buildable area (Residential/Instt.) Ha. as % of B				Total
	@ FSI 0.2	@ FSI 0.3	@ FSI 0.5	@ FSI 1.0	@ FSI 0.2	@ FSI 0.3	@ FSI 0.5	@ FSI 1.0	@ FSI 0.2	@ FSI 0.5	@ FSI 0.5	@ FSI 1.0	
Manori - Culvem	15.49	17.77	4.17	13.58	6.20	15.99	0.83	1.36	9.29	1.78	3.33	12.22	51.00
Gorai	22.61	31.57	0.00	4.91	9.05	28.42	0.00	0.49	13.57	5.26	0.00	5.30	62.09
Uttan	23.66	5.21	35.08	27.53	9.46	4.69	7.02	2.75	14.19	0.87	39.29	29.74	108.02
Pali	2.42	0.42	0.00	19.01	0.97	0.38	0.00	1.90	1.45	0.07	0.00	205.3	25.30
Chowk	9.19	0.50	0.00	9.69	3.68	0.45	0.00	0.97	5.52	0.08	0.00	10.47	21.17
Tarodi	1.81	0.00	0.00	6.62	0.72	0.00	0.00	0.66	1.09	0.00	0.00	7.15	9.62
Dongri	9.25	0.00	2.77	12.48	3.70	0.00	0.55	1.25	5.55	0.00	3.10	13.48	27.64
Morva	1.68	0.00	0.00	10.00	0.67	0.00	0.00	1.00	1.01	0.00	0.00	10.80	13.47
Total max. Built-up area	86.11	55.48	42.02	103.82	34.44	49.93	8.40	10.38	51.67	8.06	45.73	109.68	318.30
Village	Total Dev. Charges on Land in Rs.Cr.				Dev. Charges on Land (Commercial) in Rs.Cr.				Dev. Charges on Land (Residential/Instt) Rs.Cr.				Total
	0.5-1% RR	0.5-1% RR	0.5-1% RR	0.5-1% RR	1% of RR	1% of RR	1% of RR	1% of RR	0.5% of RR	0.5% of RR	0.5% of RR	0.5% of RR	
Manori - Culvem	4.39	4.56	0.40	0.60	2.51	4.32	0.13	0.11	1.88	0.24	0.27	0.49	9.96
Gorai	5.86	7.40	0.00	0.20	3.35	7.01	0.00	0.04	2.51	0.39	0.00	0.16	13.46
Uttan	2.07	0.41	1.05	0.38	1.18	0.39	0.35	0.07	0.89	0.02	0.70	0.31	3.91
Pali	0.17	0.08	0.00	0.21	0.10	0.03	0.00	0.04	0.07	0.00	0.00	0.17	0.40
Chowk	0.64	0.08	0.00	0.11	0.37	0.03	0.00	0.02	0.28	0.00	0.00	0.09	0.78
Tarodi	0.16	0.00	0.00	0.09	0.09	0.00	0.00	0.02	0.07	0.00	0.00	0.07	0.25
Dongri	0.97	0.00	0.10	0.21	0.56	0.00	0.03	0.04	0.42	0.00	0.07	0.17	1.28
Morva	0.18	0.00	0.00	0.16	0.10	0.00	0.00	0.08	0.08	0.00	0.00	0.13	0.34
Total DC on Land	14.44	12.43	1.56	1.96	8.25	11.77	0.52	0.36	6.19	0.65	1.04	1.60	30.38

Village	GZ	TDZ	D1	D2	GZ	TDZ	D1	D2	GZ	TDZ	D1	D2	Total
	Total Dev. Charges on Building in Rs.Cr.				Dev. Charges on Building (Comm.) Rs.Cr.				Dev. Charges on Building (Resid./Instt) Rs.Cr.				
	2-4% RR	2-4% RR	2-4% RR	2-4% RR	4% of RR	4% of RR	4% of RR	4% of RR	2% of RR	2% of RR	2% of RR	2% of RR	
Manori - Culvem	8.22	15.49	1.64	4.43	5.82	15.03	0.78	1.28	2.40	0.46	0.86	3.15	29.78
Gorai	11.44	27.05	0.00	1.71	8.21	25.80	0.00	0.45	3.23	1.25	0.00	1.26	40.20
Uttan	10.36	3.84	13.73	8.39	7.38	3.66	5.47	2.15	2.98	0.18	8.25	6.24	36.32
Pali	1.04	0.30	0.00	5.76	0.74	0.29	0.00	1.44	0.30	0.01	0.00	4.31	7.10
Chowk	4.25	0.40	0.00	3.01	3.09	0.38	0.00	0.81	1.16	0.02	0.00	2.20	7.66
Tarodi	0.66	0.00	0.00	1.65	0.48	0.00	0.00	0.44	0.18	0.00	0.00	1.22	2.31
Dongri	3.66	0.00	0.96	3.33	2.66	0.00	0.40	0.90	1.00	0.00	0.56	2.43	7.95
Morva	0.72	0.00	0.00	2.94	0.52	0.00	0.00	0.78	0.20	0.00	0.00	2.16	3.66
Total DC on Building	40.36	47.09	16.33	31.21	28.91	45.16	6.66	8.24	11.46	1.93	9.67	22.97	134.99
Village	Tot Dev. Charges on Land & Building in Rs.Cr.				Dev.Charges on Land & Bldg. (Comm.) Rs.Cr.				Dev. Charges on Land & Bldg. (Resid./Instt) Rs.Cr.				Total
Manori - Culvem	12.61	20.05	2.05	5.03	8.33	19.35	0.92	1.39	4.28	0.70	1.13	3.65	39.74
Gorai	17.30	34.45	0.00	1.91	11.56	32.81	0.00	0.48	5.74	1.64	0.00	1.43	53.66
Uttan	12.43	4.25	14.78	8.77	8.56	4.05	5.82	2.22	3.87	0.20	8.95	6.55	40.23
Pali	1.21	0.33	0.00	5.97	0.83	0.31	0.00	1.48	0.38	0.02	0.00	4.48	7.50
Chowk	4.89	0.43	0.00	3.12	3.46	0.41	0.00	0.83	1.43	0.02	0.00	2.29	8.44
Tarodi	0.82	0.00	0.00	1.74	0.57	0.00	0.00	0.45	0.25	0.00	0.00	1.29	2.56
Dongri	4.64	0.00	1.06	3.53	3.22	0.00	0.43	0.94	1.42	0.00	0.62	2.60	9.22
Morva	0.90	0.00	0.00	3.10	0.62	0.00	0.00	0.81	0.28	0.00	0.00	2.29	4.00
Total DC on Land & Building	54.80	59.51	17.88	33.18	37.16	56.93	7.17	8.60	17.64	2.58	10.71	24.57	165.37

Table 7.7: Summary of Revenues

Sr. No.	Description	Revenue in Cr.
i	Development Charges	165.37
ii	Premium on additional FSI	430.97
iii	Lease of Government Land	341.22
	Total Revenue	937.56
	Total Cost as per Table 7.2	851.61

7.2.3 Other Possible Revenue Sources

There will be other sources which will be significant:

- Grants from Government schemes
- Water usage and sewerage charges
- Increased ferry ticket charges for tourists
- Surcharge on bus ticket into the area from Manori side after the bridge is constructed
- Surcharges on tickets to Essel World and new proposed amusement park at Manori
- Entry tolls from tourist buses and outside private vehicles into the area
- License fees from mobile vendors
- Surcharges on room rents in resorts / hotels
- Advertisements on select roads and places that are to be developed

These are not possible to exactly estimate at this stage but will have to be systematically put in place and managed as the infrastructure costs are high. These would primarily meet the O & M costs and support some plan investments. However, the above may be collected by MCGM, MBMC or MMRDA based on the institutional arrangement for capital investment and service provision.

7.3 Phasing of Plan Implementation

7.3.1 Phasing

The development plan proposals shall be implemented in two phases : Phase I from 2012 to 2017 and phase 2 from 2018 to 2022.

All vital road links - both widening and new links to serve the local population as well as tourists will have to come in phase I while bridges, jetties and all the tourism related projects involving substantial costs shall be taken up in the 2nd phase. Since fishing is the major source of livelihood of the natives, promotion of fishing and related activities shall be undertaken in the 1st phase. Public amenities which are population based, such as education, health and open spaces can come in proportion to the expected population growth in each phase. The remaining projects and activities may be subsequently taken up in phase 2.

As can be seen from the tables above, revenue generation and rationalizing the cost of implementation of the Development Plan are based on the assumption that usable government owned lands will be transferred to the Planning Authority. Reasonable assumptions in this regard are made. However, except for the lands which are placed under reservations, the rest of the land owned by MTDC is expected to be retained and developed by MTDC.

The details of works and the associated costs as envisaged for Phase-I of implementation of the Development Plan is indicated in Table No. 7.8 given below. However, the works of construction of Bus Depots, Police Stations & Posts, and the Municipal Offices are also anticipated in Phase-I, but since these are located on Government lands and are expected to be constructed by the respective authorities, the same is not costed in the table mentioned.

Table 7.8: Details of Works and Costs envisaged in Phase-I of Implementation

No	Item	Description of item	Area (Ha.)	Private land (Ha.)	Cost of Land Acq. (Rs. Cr.)	Cost of dev. (Rs. Cr.)	Total cost (Rs. Cr.)
1	Widening of existing roads	1. Widening of existing 9M wide main road to 30M from Morva to Manori jetty (excluding where existing road is bypassed) 2. Widening of Gorai jetty road to 20M 3. Widening of existing 3.5-5M wide Dongri-Uttan road to 9M (excluding where existing road is bypassed)	33.04	67% Pvt land 22.14	25% land acquisition (75% TDR) 22.97	25% land acquisition (75% TDR) 132.84	155.81
2	Construction of new roads	1. 30M wide bypass stretches of main road at Dongri, Gorai and Manori 2. 12M wide bypass stretches of 12M wide road at Tarodi, Pali and Uttan 3. 12M wide Gorai coastal road 4. 9M wide Manori coastal road 5. 9M wide road around Keshav Shrishti	23.24	67% Pvt land 15.57	25% land acquisition (75% TDR) 16.15	25% land acquisition (75% TDR) 93.42	109.57
3	Education Facilities	1. Primary & Sec. School at Dongri (R 22) 2. Primary School at Uttan (R 17) 3. Secondary School at Gorai (R 42)	1.13	0.45	0.45	10.17	10.62
4	School Play Grounds	1. Play Ground at Dongri (R 23) 2. Play Ground at Pali (R 7) 3. Play Ground at Uttan (R 18) 4. Play Ground at Gorai (R 41)	1.65	0.36	0.36	0.75	1.12
5	Health Fac.	1. Hospital at Manori (R 43)	0.47	0.00	0.00	2.53	2.53
6	Public Play Grounds	1. Ground at Manori (R 53) 2. Public Play Ground at Gorai (R 78)	5.22	0.39	2.85	2.20	5.05
7	Fire Station	1. Fire Station at Uttan near Keshav Shrishti (R 80)	0.44	0.00	0.00	1.33	1.33
8	Bus Depots	1. Bus Depot at Gorai near Keshav Shrishti (R 73) 2. Bus Depot in Uttan (R 34)	2.37	1.13	1.39	By Others	1.39
9	Tourist Amenity Centres	1. Manori Jetty 2. Gorai beach 3. Manori beach	0.44	0.13	0.96	2.19	3.15
10	Police Stn	1. At Gorai (R 82)	0.69	0.00	0.00	By Others	0.00
11	Jetty Impmt.	1. At Manori	-	-	-	0.09	0.09
12	Junction Impmt.	1. At Dongri and Gorai Jetty Junctions on proposed 30 M wide road	0.63	-	-	0.63	0.63
		Total of Phase-I	69.32	40.17	45.13	246.15	291.29

7.4 Tentative Plan Implementation Mechanism

MMRDA, as SPA is responsible for preparation of Development Plan and its implementation. At present, the infrastructure is being provided and managed by the two Municipal Corporations of MCGM and MBMC. The Special Planning Authority through the Development Plan aims to provide a uniform vision, strategy and level of service to the population in the notified area. However, several agencies who are presently providing the actual services like MRSTC, MMBC, MCGM may continue to do so. Apart from MCGM and MBMC several other agencies will be involved in implementing some of the proposals such as, Urban Development Department, Revenue Department, and Forest Department etc.

MMRDA being an umbrella organization already has capacity to plan, manage and implement projects. It can then set up an SPV, if required, to implement certain vital projects. However, it is proposed that basic infrastructure proposed in the Plan, such as water supply, sewerage, solid waste management etc. be implemented by the respective Municipal Corporations. Development Permissions, however, will be granted by the MMRDA. Similarly, development of transportation projects such as roads, jetties etc can be undertaken by MMRDA. The health and education facilities and crematoria/burial grounds are expected to be developed and managed by the Municipal Corporations and landowners, as applicable. Lakes and gardens, tourism amenity centers etc are proposed to be developed by MMRDA.

7.5 Summary of Initiatives by Type and Benefits

The Development Plan consists of a roster of integrated and comprehensive set of development projects. In order to realize the development vision of the area a variety of actions are required. Some of these regulatory interventions such as zoning, reservations and development control regulations, while others are direct capital investments such as water supply, sewerage, road networks etc and there are some policy interventions such as introduction of small buses on CNG, ban on use of certain types of plastics etc. Further there will be a variety of benefits that will accrue to the MGU Notified Area as a whole in the long term.

The projects can be primarily categorized as:

- a. Regulatory
- b. Capital Investment
- c. Policy Action

Table 7.9: Development initiatives by Type and Benefits

No	Name of Proposal	Type	Benefits
6.1 Land Development			
1	Delineation of land use zones	Regulatory	<ul style="list-style-type: none"> • Conservation and protection of environmental features of the area
2	Delineation of heritage precincts	Regulatory	<ul style="list-style-type: none"> • Conservation and protection of heritage of the gaothans and other structures • Preserve the built form of settlement from rampant development pressures • Enable adaptive reuse of structures • Increased tourism activity leading to generation of revenues and employment
3	Preparation of Development Control Regulations	Regulatory	<ul style="list-style-type: none"> • Coherent and contiguous urban form • Better compliance resulting in well planned development • Conservation and protection of heritage value of the gaothans • Protection of environmental features

No	Name of Proposal	Type	Benefits
4	Identification and Appropriate Utilization of Government Lands in the Notified Area	Policy action	<ul style="list-style-type: none"> • Reduce hardship of the people by proposing reservations for infrastructure and amenities on government land • Enable realization of reservations and special projects • Enable efficient use of government owned land to generate revenues for financing infrastructure and other public purpose projects
5	Inclusion of the area excluded from the NA (survey no. 341 in Uttan)	Regulatory	<ul style="list-style-type: none"> • Ensure holistic development • Result in coherent and contiguous built form •
6.2 Road Network and Transportation			
1	Preparation of a structure plan for road network and transportation	Capital investment	<ul style="list-style-type: none"> • Provide efficient connectivity with the area and to places of tourist interest to serve local population and tourists • Provide better connectivity with Mumbai • Pedestrian/ cyclist friendly streets
2	Preparation of guidelines for designing roads and pedestrian trails	Detailed study	<ul style="list-style-type: none"> • Efficiently organized streets • Pedestrian friendly and safe streets
3	Refurbishment of the existing jetties and developing facilities around them	Capital investment	<ul style="list-style-type: none"> • Enhance and improve the connectivity with the mainland by water • Create attractive and organized tourist facilities
4	Building new jetties and developing facilities around them	Capital investment	<ul style="list-style-type: none"> • Enhance and improve the connectivity • Create attractive and organized tourist facilities
5	Introduction of small sized buses using CNG within the MGU NA	Policy action, Capital investment	<ul style="list-style-type: none"> • Prevent air pollution • Improve connectivity within the area • Improve convenience of tourists • Better access to areas with smaller roads
6	Redefining the bus routes, designating bus stops and bus depot	Policy action, Capital investment	<ul style="list-style-type: none"> • Improve connectivity/ accessibility to all developed, developable areas and places of tourist interest • Increase convenience in movement for tourist and locals
6.3 Social Infrastructure and Amenities			
1	Reservation of lands for education facilities	Regulatory, Capital investment	<ul style="list-style-type: none"> • Improve quality of life for residents
2	Reservation of lands for health facilities	Regulatory, Capital investment	<ul style="list-style-type: none"> • Improve quality of life for residents
3	Reservation of lands for recreation and open spaces	Regulatory, Capital investment	<ul style="list-style-type: none"> • Improve quality of life for residents
4	Reservation of lands for crematoria/ burial grounds	Regulatory, Capital investment	<ul style="list-style-type: none"> • Improve quality of life for residents
5	Reservation of lands for fishing related activity	Regulatory, Capital investment	<ul style="list-style-type: none"> • Improve quality of life for residents • Promote the local fishing activity
6	Reservation of lands for tourism amenity & information centers	Regulatory, Capital investment	<ul style="list-style-type: none"> • Provide all information and amenities which will make the place visitor friendly
7	Reservation of lands for parking lots and bus depots	Regulatory, Capital investment	<ul style="list-style-type: none"> • Provide organized parking spaces thereby avoiding congestion of streets • Facilitate plying of public transport buses appropriately
8	Reservation of lands for police posts and stations	Regulatory, Capital investment	<ul style="list-style-type: none"> • Facilitate maintaining law and order • Provide a sense of security
9	Reservation of lands for municipal offices	Regulatory, Capital investment	<ul style="list-style-type: none"> • Facilitates setting up of local branch of municipal office to provide civic amenities • Provides forum for addressing local grievances

No	Name of Proposal	Type	Benefits
6.4 Recreation and Tourism			
1	Facilitating the development of Tourism Development Zone	Regulatory Policy action	<ul style="list-style-type: none"> Organized and planned development in the area Appropriate land allocation for developing tourism facilities Prevent the indiscriminate spread of tourism facilities in the entire area Sustainable development of tourism activity
2	Development of Gorai and Manori beaches with facilities	Regulatory, Capital investment	<ul style="list-style-type: none"> Better management of activities on beaches Attract more tourists/ visitors Contribute to economic development of the area Generate employment for locals
3	Setting up tourist amenity and information centres at entry points and along the beaches	Capital investment	<ul style="list-style-type: none"> Provide all information and amenities to make the place visitor friendly Provide required amenities to visitors to the beach and to avoid littering of the beaches
4	Development of mangrove park near Global Pagoda	Detailed study, Capital investment	<ul style="list-style-type: none"> Ensure preservation of mangroves along with their recreational use Create awareness among tourists/ visitors/ children about importance of mangroves
5	Development of mangrove board walk from Gorai jetty road	Awareness creation, Capital investment	<ul style="list-style-type: none"> Provide a unique experience to tourists/ visitors/ children Create awareness among tourists/ visitors/ children about importance of mangroves
6	Developing and operating mangrove boat ride from Gorai jetty	Awareness creation, Capital investment	<ul style="list-style-type: none"> Provide a unique experience to tourists/ visitors/ children Create awareness among tourists/ visitors/ children about importance of mangroves
7	Operating fish tours (seasonal)	Capital investment	<ul style="list-style-type: none"> Provide a unique experience to the tourists Provide employment to locals
8	Designing and developing promotional material for the area	Capital investment	<ul style="list-style-type: none"> Rich information about various sites, activities, fairs and boarding and lodging facilities in the area Awareness about ecological features and natural attractions in the area Attract a wide variety of tourists Increased economic activity
9	Organizing special events (annual, monthly)	Awareness creation, Capital investment	<ul style="list-style-type: none"> Attract large number of tourists of different age groups to the area Attract a wide variety of tourists Develop the area as a cultural hub Increased economic activity - encourage tourists to visit frequently and stay longer
10	Developing appropriate signage, lighting and advertisement- system	Detailed study, Capital investment	<ul style="list-style-type: none"> Make the place tourist friendly
11	Designing and developing heritage walks at Dongri, Gorai, Culvem and Manori	Capital investment	<ul style="list-style-type: none"> Preserve the heritage value of these gothans Provide a unique experience to tourists/ visitors/ children
6.5 Environment			
1	Regeneration and conservation of mangroves in No Development Zone	Detailed study, Capital investment	<ul style="list-style-type: none"> Increase mangrove cover and restoration of the natural habitat of the fauna - birds, fish Create awareness amongst the local communities Create local employment in the regeneration activity
2	Afforestation on the slopes of three ridges	Detailed study, Capital investment	<ul style="list-style-type: none"> Substantial increase in green cover Enhanced natural/ scenic beauty of the area Increased attraction for hiking and trekking
3	Development of a botanical garden and nursery at Gorai-Manori	Detailed study, Capital investment	<ul style="list-style-type: none"> Efficient use and rejuvenation of derelict/ waste lands An opportunity to create revenue in a manner that is sympathetic to the ecological features of the area Availability of plants of local species for plantation on

No	Name of Proposal	Type	Benefits
			<ul style="list-style-type: none"> the hill slopes • Availability of mangrove saplings for regeneration of bald patches in the mangrove area • An opportunity for educational tours • Employment to the local people
4	Development of water bodies as passive recreational and green spaces	Detailed study, Capital investment	<ul style="list-style-type: none"> • Creation of recreational areas for locals and visitors • Water recharge wells in the talav will aid the process of recharge of the top aquifer
6.6 Water Supply			
1	Augmentation and strengthening the existing water supply system	Detailed study, Capital investment	<ul style="list-style-type: none"> • Overall cleanliness and hygiene in the area • Improved quality of life for residents
2	Introduction of water meters	Capital investment	<ul style="list-style-type: none"> • Efficient and sustainable use of water resources
3	Commissioning a detailed study to develop and tap local sources to manage future and additional demand	Detailed study, Capital investment	<ul style="list-style-type: none"> • Efficient and sustainable use of water resources • Overall cleanliness and hygiene in the area • Improved quality of life for residents
6.7 Sewerage			
1	Designing a decentralized sewerage system and treatment plants	Detailed study, Capital investment	<ul style="list-style-type: none"> • Overall cleanliness and hygiene in the area • Improved quality of environment
6.8 Solid Waste Management			
1	Designing a comprehensive and integrated system to manage solid waste in a sustainable and efficient manner	Detailed study, Capital investment	<ul style="list-style-type: none"> • Efficient and sustainable solid waste management • Overall cleanliness and hygiene in the area • Improved quality of environment
2	Using segregated bins at all public places and recreational areas	Capital investment	<ul style="list-style-type: none"> • Better solid waste management, reduction in wastes to be treated, and therefore result in economic benefits • Easier to recycle waste and process non-recyclable waste at a later stage • Overall cleanliness and hygiene in the area supported by a well managed system
3	Putting in place sign boards to keep areas clean	Detailed study, Capital investment	<ul style="list-style-type: none"> • Awareness about a clean environment will help in maintaining cleanliness
6.9 Economic Development			
1	Delineation of fishing and allied activities zone to promote fishing and related activities	Regulatory	<ul style="list-style-type: none"> • Retain the existing ancillary fishing activity and help in promoting it • Generate confidence and trust in the community for future initiatives and proposals • Walking tours, fishing tours will generate additional revenues for fishing co-operatives
2	Allocation of land for cold storage facility, fish processing unit and fish market at Pali	Regulatory	<ul style="list-style-type: none"> • Expand the scale of fishing and result in increased incomes for fishermen, and consequently contribute to the economic development of the area
3	Promotion of floriculture, vegetable farming, high value added crops and green houses in the Green Zone	Policy action	<ul style="list-style-type: none"> • Increased agricultural productivity • Expansion of the local economic base • Local employment generation • Increased incomes of farming households • Protection of green cover in the area
4	Promotion of home-based fish and vegetable pickling activity	Policy action	<ul style="list-style-type: none"> • Create value addition in the area • Expansion of local economic base • Inclusion of women in the economic base • Generation of employment within the area for local community

