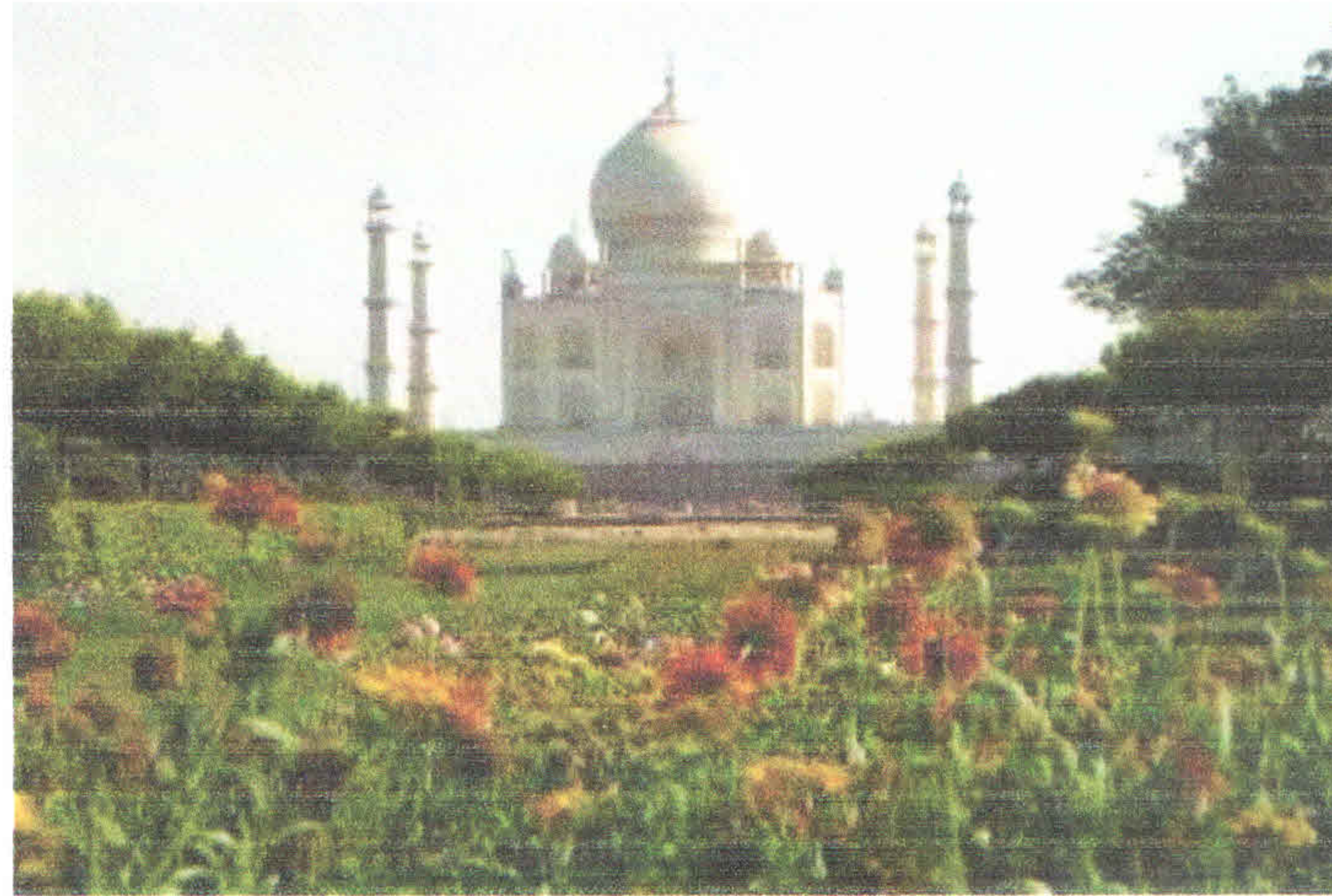




AGRA NAGAR NIGAM



ACTION PLAN FOR INCREASING GREEN COVER BY 15% IN AGRA (Draft Report)

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DEFINITIONS

Green Cover:

All Green Areas including, Tot-Lots, Neighborhoods Parks, City Level Parks, Parks in Private Colonies, Green Buffer, Regional Parks, Forest Area, any Other Parks, Recreational Spaces.

Tree Cover:

Trees planted along the roads within the right-of-way and on the central verge (median).

Green Strip:

A green strip is developed on a vacant land for example land under high tension power supply lines. It is also developed along the arterial roads separating residential areas from other uses.

Reserve Forest:

Reserve forest is an area duly notified under the provisions of the Indian Forest Act 1927 or State Forest Acts having full protection. In reserve forest all activities are prohibited unless specifically permitted.

Protected Forest:

They are forest in urban and peri-urban areas generally secured by appropriate fencing or compound wall etc. Areas under notified/ protected forests are protected under the Forest Act, where no construction activity is allowed.

National Park:

It is an area which is set aside for the protection and conservation of outstanding natural fauna, flora, geographical formations and natural scenic areas. It has various prohibitions like hunting, killing or capturing fauna etc.

District Park:

It is a designated term as per hierarchy of green spaces in a city. As per Delhi Master plan 2021, a District park has to be provided at city level for a population of 2,50,000 and with an area of 40,000 sq.m.

Neighborhood Park:

Neighbourhood Park is developed at the neighbourhood level for a population of 10,000. The Park is conveniently located within the developed residential areas at walking distance and is planned on an area of 2,000-4,000 sqm.

Totlots:

Totlots are the lowest level in the hierarchy of green areas, planned for a population of 2,500 as play-areas for children with an area of 125 sqm.

Playgrounds:

Playgrounds are provided normally in the educational institutions for the use of the school and college students. They are also provided at the neighbourhood level for a population of 5,000.

Green Belt (Buffer):

Green Belts Include green girdle, park belt, rural belt, rural zone, agriculture belt, country belt, agriculture green belt. Agriculture belt, rural and country belt are

synonymous terms and they refer to a stretch of the country side around and between towns separating one from the other. These areas are predominantly farm lands and they support agriculture and related functions. They may or may not be in ownership of the town/city/local body.

Green Strip:

A green strip is developed on a vacant land for example land under high tension power supply lines. It is also developed along the arterial roads separating residential areas from other uses.

Tree Cover:

Trees planted along the roads within the right-of-way and on the central verge (median).

1. INTRODUCTION

1.1 Background

Agra is an international tourist center representing India as it hosts the iconic 'TajMahal' and is among the few places in the country that are most visited by both the International and domestic tourists. Being a part of 'The Golden Triangle' every year approximately 40-lakh people come to visit the TajMahal and add to the city crowd and use the city infrastructure. Apart from Taj, Agra also hosts other tourist attractions like Akbar's tomb i.e. Sikandra, Agra Fort, Itmad-ud-daula and Fatehpur Sikri. All of them are spread in different directions. Such as Fatehpur sikri, which is 42 km in the west from Agra boasts of Mughal Glory. As per provisional reports of Census of India, population of Agra city in 2011 is 15,85,704 and is one of the most important metropolitan cities in the world.

Agra has been a flourished city for a long. It has also witnessed the title of Mughal capital under the Mughal Empire from where the entire empire was controlled. It is the recent developments which has challenged the city growth due to rapid population growth, massive expansion of city sprawl with inadequate planning and administrative resources.

1.2 Vision for increase in Green Cover

Though green cover should be an integral part of a city's master-plan, it's not being practiced with the required velocity. It is a dedicated/ reserved space for the plantation specially the identified trees which provides in-numerable benefits to urban community ecosystem. Urban farming, urban forestry and social forestry in urban areas may be seen as of the prime importance today in some cases as they can improve the tree cover while including the society as well. Though most of the Indian cities have developed master plans/ development plans to make the cities

livable but present condition in majority of them suggests the interventions in urban green cover is not being well thought of except in some of the planned cities like Gandhinagar, Chandigarh, Greater Noida etc, which is resulting in alarming levels of air pollution, noise pollution and low standard of living in majority of areas.

Agra being one of the most important tourism destinations has been a recent topic due to a petition in the Hon'ble Supreme Court of India to draw the attention of policy makers and other stake holders towards the alarming situations of the city environment. Court has already directed either to close down the polluting industries or to switch to cleaner fuel like gas. The directions have been implemented but no consistent improvements in the environment are observed, hence, it becomes clear that unless we manage the tree cover in Agra, we cannot solve the problems.

Urban areas are growing exponentially in haphazard manner and it's quite natural that to cater this vast increasing population in urban lifestyle, along with immense resource utilization large urban sprawls are being observed at the cost of green spaces which is clearly a non-sustainable scenario over a near future. Though urbanization has been a topic of discussion since ages but the cost and effect of urbanization was untouched until it became critical to intervene. Hence, the government of India have come up with 'Urban Green Guidelines 2014' for reshaping and retrofit such similar cities for a greener and better future.

Apart from government, there has been lot of studies and efforts nationally and internationally by various learned persons/ institutions to standardize urban greenery.

For example - A ratio of at least one tree per person is considered necessary to maintain a healthy urban environment, said lead author of a similar study, T.V. Ramachandra of the Indian Institute of Science (IISc).

Experts in Germany, Japan and other such countries have proposed a standard of 40 sq.m per capita high quality green space or 140 sq.m per capita suburb forest for ecological balance and human well-being.

WHO recommends 9 sq.m per capita open space and green areas to be within 15 minutes walk from residential areas.

1.3 Aim:

To increase Green Cover in Agra City upto 15%

1.4 Objectives:

- To study the current status of Green Cover in Agra.
- Analysis of Master Plan 2001-2021
- To prepare and update area inventory of different departments for improvement in Green Cover.
- To study case studies for Green Cover
- To prepare long term strategy for improvement in Green Cover

1.5 Scope of Work:

The study of Green Cover is done under Municipal limits of Agra city to improve quality of life in city, reduce pollution and maintain micro climate of the city.

1.6 Limitations:

Study of Green Cover is limited to Municipal limits only.

2. PRESENT STATUS OF GREEN COVER IN AGRA

There is dearth of information about green cover in urban areas especially for our city and urban agglomerations, as this work has not been attempted in a systematic

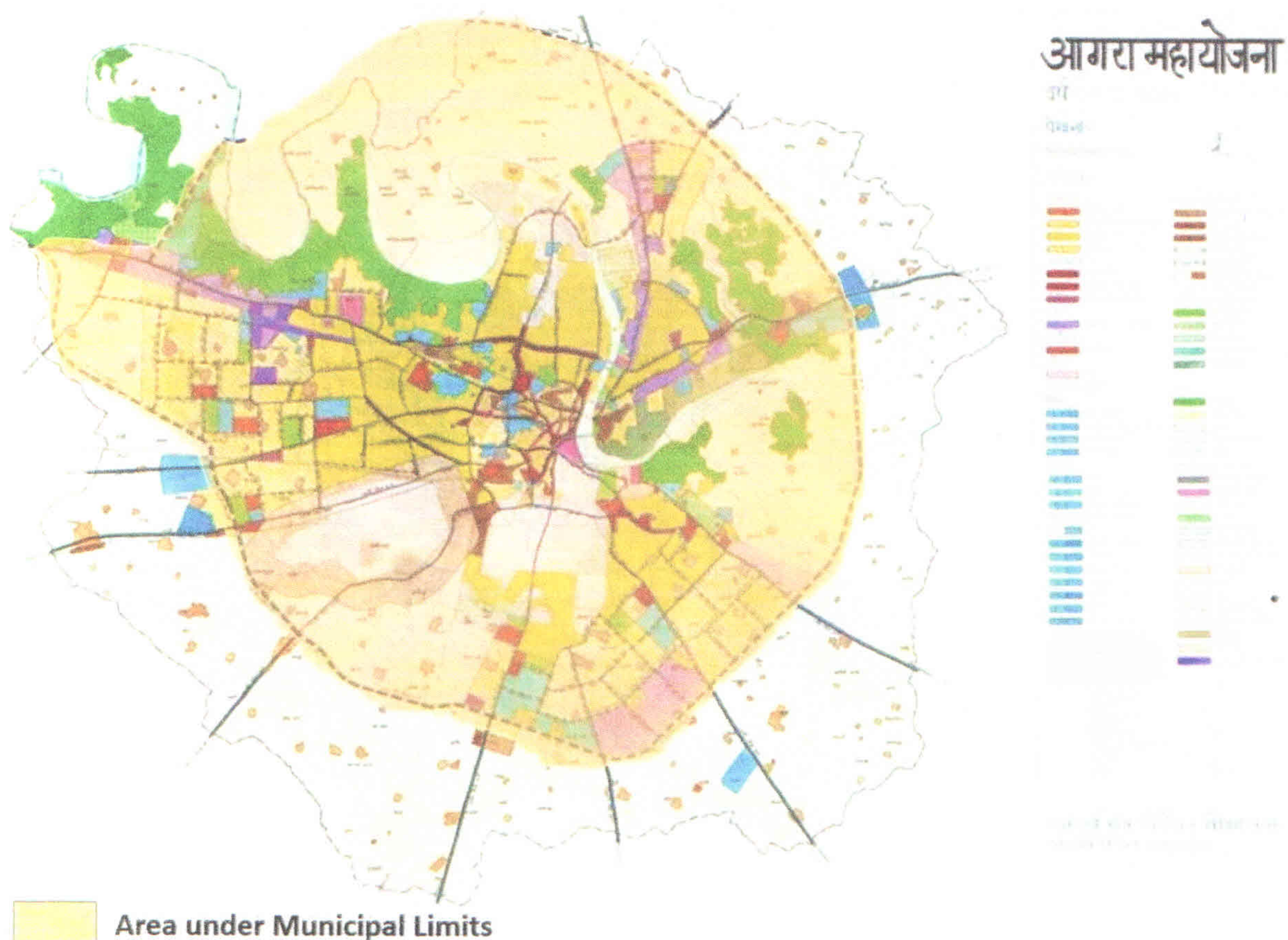
manner by ULB, Government Departments, academic organizations or NGOs. Green spaces, quiet streets and recreational parks are important for relaxation, health and sport, nature watching and social activities. Open areas and green parks are important building blocks for promoting quality of life in urban environments. Below given is the present status of Green Cover in Agra City:

S.No.	Departments	No. of Parks	Area of Parks (sq.m)	Proportions
1	ULB	369	9,64,158.00	
2	Development Authority	207	5,77,000.00	
3	Horticulture Department	05	18,82,395.26	
4	Social Forestry	01	7,50,000.00	
5	Private Ownership- Corporate/ NGO's	34	56,600.00	
6	Educational Institute			
7	JalKal Department			
8	Religious Institutions			
9				
	Total	583	42,30,153.26	

According to SLIP 2015 Green Area under Municipal Limits has been achieved up to 12% i.e 16.92 sq.km (1,69,20,000 sq.m)

<p>Total Area under ULB = 141.00 Sq.km.</p> <p>Total Green Cover = 16.92 Sq.km.</p>

3. STUDY AND ANALYSIS OF MASTER PLAN OF AGRA 2001-2021



Description of Entertainment and Open areas under land-use according to the Master Plan 2001-2021 (in Hectares):-

S.No.	Description	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7	Total
1	Sectoral Park	2.56	32.62	152.10	-	94.72	38.13	23.04	343.17
2	Regional Park	-	124.00	-	-	-	-	-	124.00
3	Zonal Park	-	-	-	-	-	89.87	-	89.87
4	Entertainment Park	-	175.00	-	-	-	-	-	175.00
5	National Park	-	-	-	-	-	-	143.36	143.36
	Other Open Areas								
6	Green Belt	-	-	-	25.42	160.36	28.80	107.16	390.86

7	Nursury	-	-	-	-	-	-	30.72	30.72
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Total Area under Master Plan = Hectares

Total Area under Green Cover upto 2021 = 1296.98 Hectares

Detailed Plan of Zone-2

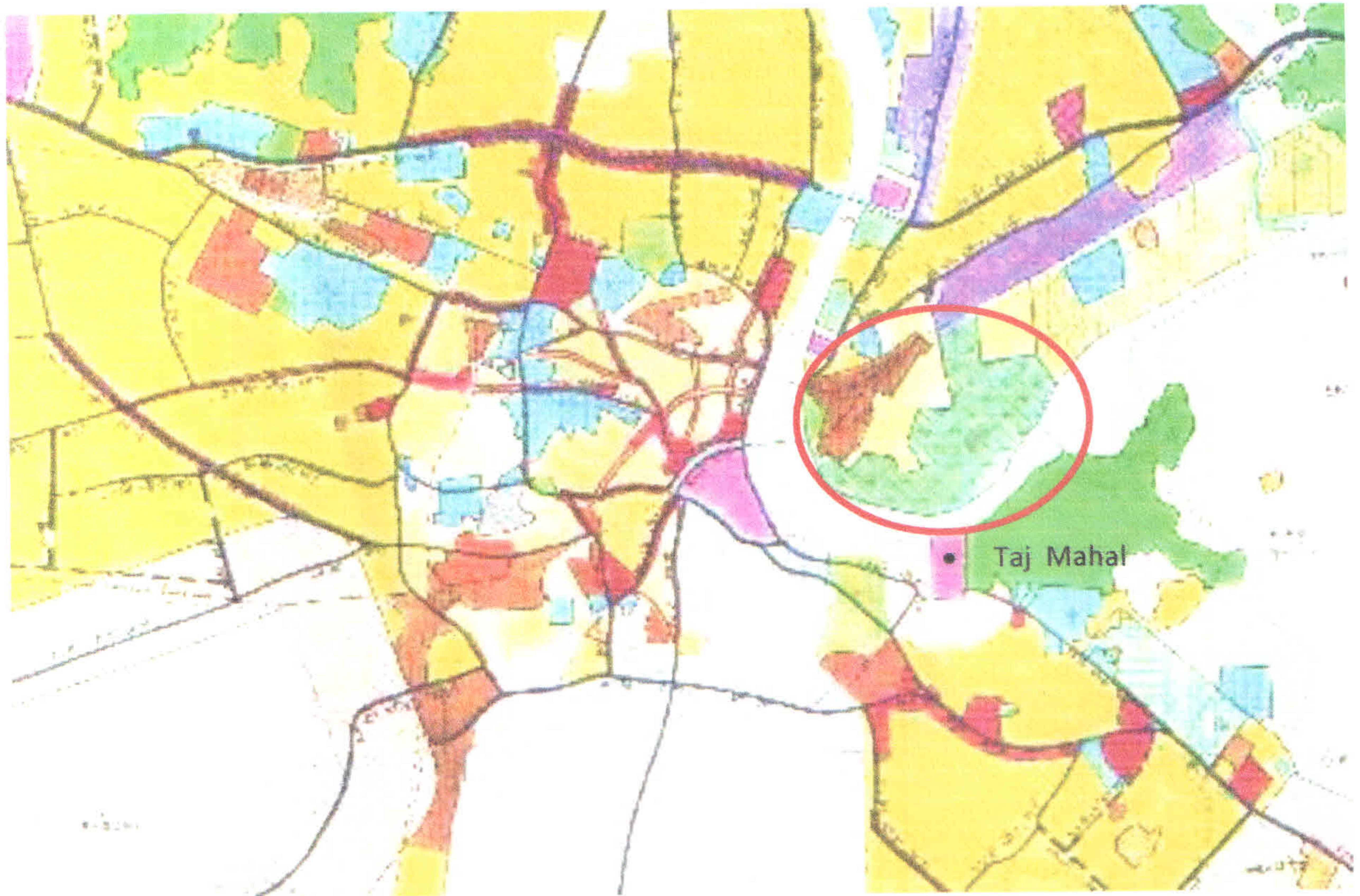


According to the Detailed Plan of Zone-2 more than 40% of the area consist of Green Cover by 2021. The area behind Akbar's Tomb at Sikandra i.e. Baipur Ahatmali is a proposed regional park. 50% (approx.) of this regional park is under ULB limits.

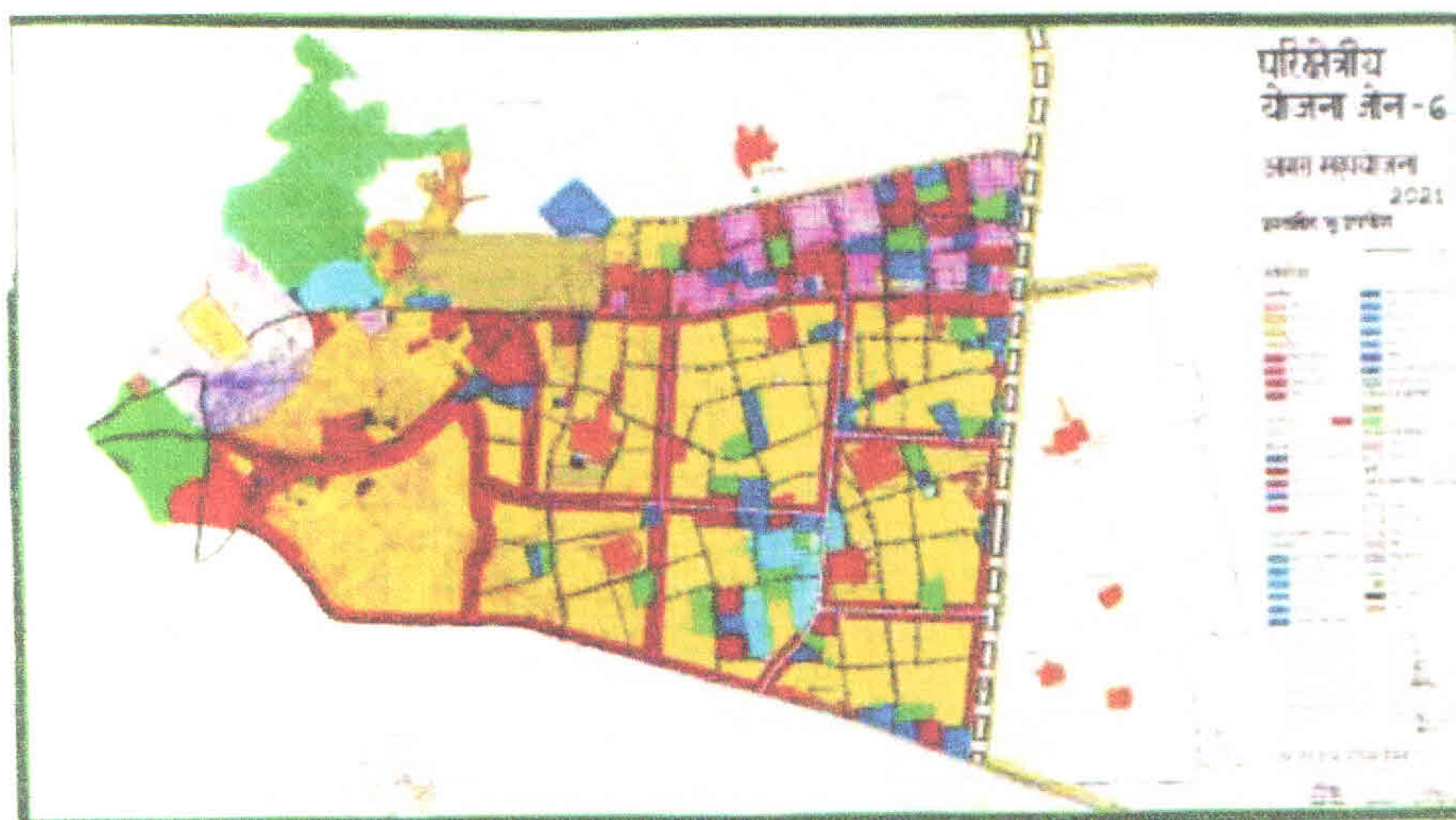
Another proposal is that of National Park opposite Taj Mahal



Across river Yamuna. The area also consists of the Archaeological Survey of India (ASI) secured Mehtab Bagh. This proposed national park is again a very important part of Master Plan 2021 and under the jurisdiction of Municipal Limits.



Detailed Plan of Zone-6



This zone has very limited green Space and consists of Subhash Park at MG Road in the heart of the city as in the proposal.

4. INVENTORY TO INCREASE GREEN COVER BY 15% IN CITIES

Data Acquisition/ Collection From Concerned Departments at City/ ULB Level

S.No	Department	Units	Total Land Available	Built up Area	Remaining Vacant Land	Land Available for Plantation/ Green Cover
1	ULB/Municipal Area	Sq. Km	141			
2	Development Authority					
3	Forest Department					
4	Education/ Institutional					
5	Housing Board/ State Housing					
6	Irrigation Dep.					
7	Agriculture Dep.					
8	NGO's					
9	Heritage/ Archeological					
10	Private Ownership					
11	Residential Housing Area/ Colony/ Scheme					
12	State Public Works Department					
13	Horticulture Dep.					
14	NHAI/ SHAI					
15	Industrial Authority Area (State/ National)					

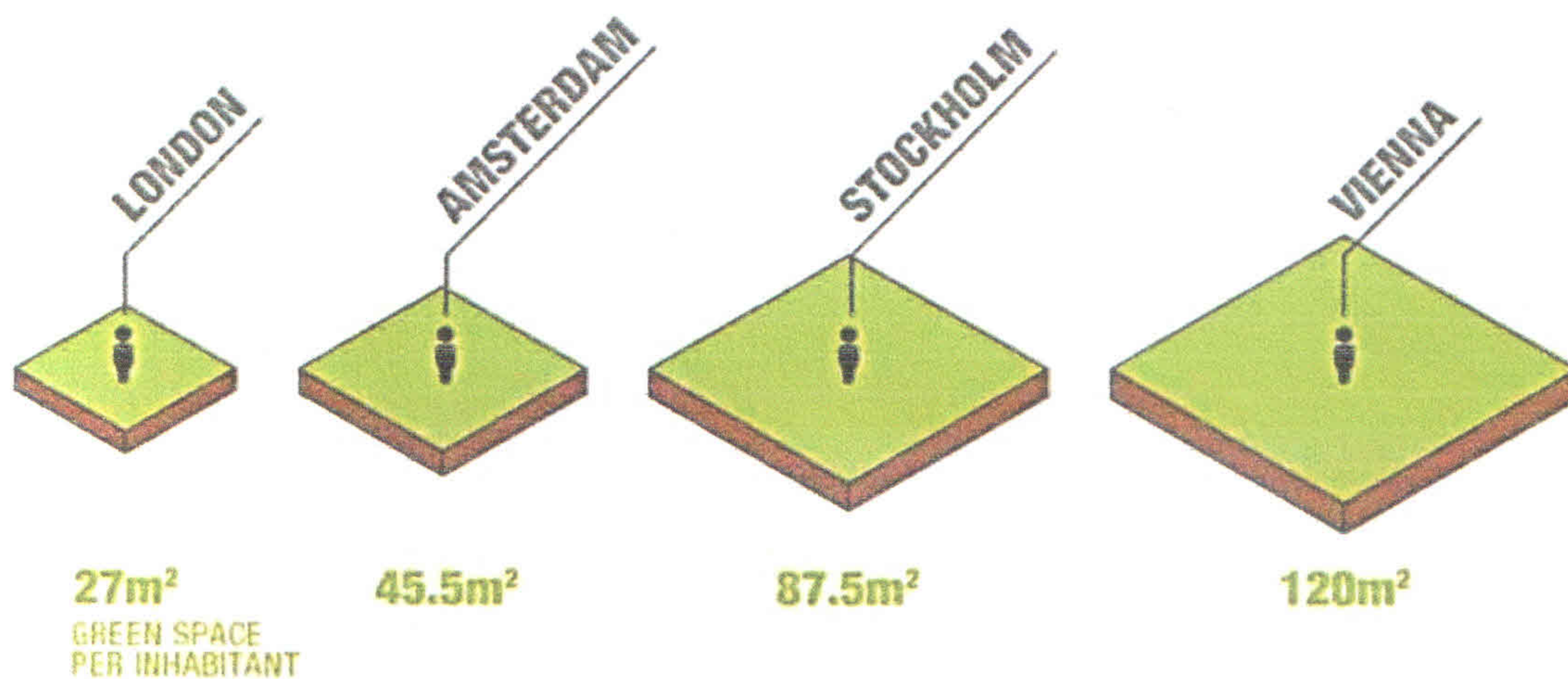
5. ISSUES WITH RESPECT TO CONSERVATION OF URBAN GREEN SPACES:

- I. Absence of long term planning resulting in frequent changes in land use. As a result there is lack of integration of trees/ greens in planned development process and trees are often planted as an afterthought.
- II. Land covered with trees is viewed as loss of opportunity cost when compared to the land put to commercial and infrastructural uses. There is tremendous pressure on green areas/trees for competing land uses especially for expanding infrastructure.
- III. Limited space available for tree planting. Trees are often viewed as obstruction to development and therefore become the first casualty in the process.
- IV. Water scarcity. Refractory soil and stressful growth conditions impact proper growth and health of trees. Leading to high cost of development and maintenance. Lack of trained manpower for management of greens is also poses serious problem.
- V. High public pressure on urban greens due to high floating population. Urban poverty and homelessness encourages squatting in open areas reserved for trees.
- VI. Lack of respect. Sensitivity and care often from different cross sections of the society green spaces/ young plantations/ saplings prone to vandalism.

6. CASE STUDIES:

It is estimated that about 50% of the world's population is living in urban areas. By 2050, this figure will increase upto 70% and already many cities across the world are struggling to cope with pressure from a rapidly increasing population.

Housing supply, unemployment levels, pollution and outdated infrastructures are just some of the biggest challenges that are impacting the quality of living, all of which have an impact on what makes great liveable cities.



Some of the world's most livable cities provide public accessible green spaces with physical amenities in the heart of their neighbourhoods. Vienna, which regularly ranks in the top positions for the world's most livable cities, is one of the greenest cities of over a million inhabitants in the world.

51% of Vienna is classified as green space. For each of Vienna's 1.7 million inhabitants, there are 120 square meters of green space. This figure is also set to grow as the city is funding projects to green up courtyards and façades, as well as planting new avenue trees. [source: wien international]

The Siemens Green City report suggests that Singapore, which is the third-densest city in the world, should be a role model for spatial planning as the city has been able to combine extensive green spaces with high population density.

The World Health Organization (WHO) has suggested that every city should have a minimum of 9 square metres of green space per person. Yet Istanbul, which has a population of over 14 million people, provides only 6.4 square metres of green space per person. Tokyo and Buenos Aires provide some of the lowest at 3 square metres and 1.9 square metres per person respectively.

7. LONG TERM STRATEGY TO ENHANCE TREE COVER:

Urban greens would include forest land if any, tree cover, parks, tree lined avenues in public land as well as in private and institutional property. There is a need for a well-defined strategy for enhancing green cover in urban areas. The strategy should consist of a multipronged approach to integrate development of green cover as a part of the development plans of cities by viewing them as a component of urban infrastructure. There is a need for a comprehensive vision based policy with enough flexibility so as to strike a balance between the requirement of protecting and enhancing green cover and overall urban development. Urban greens including trees should be considered as an integral component of urban renewal projects implemented by the ULB. Urban green projects must be supported by participatory planning and implementation process for actualizing the spirit of cooperative citizen.

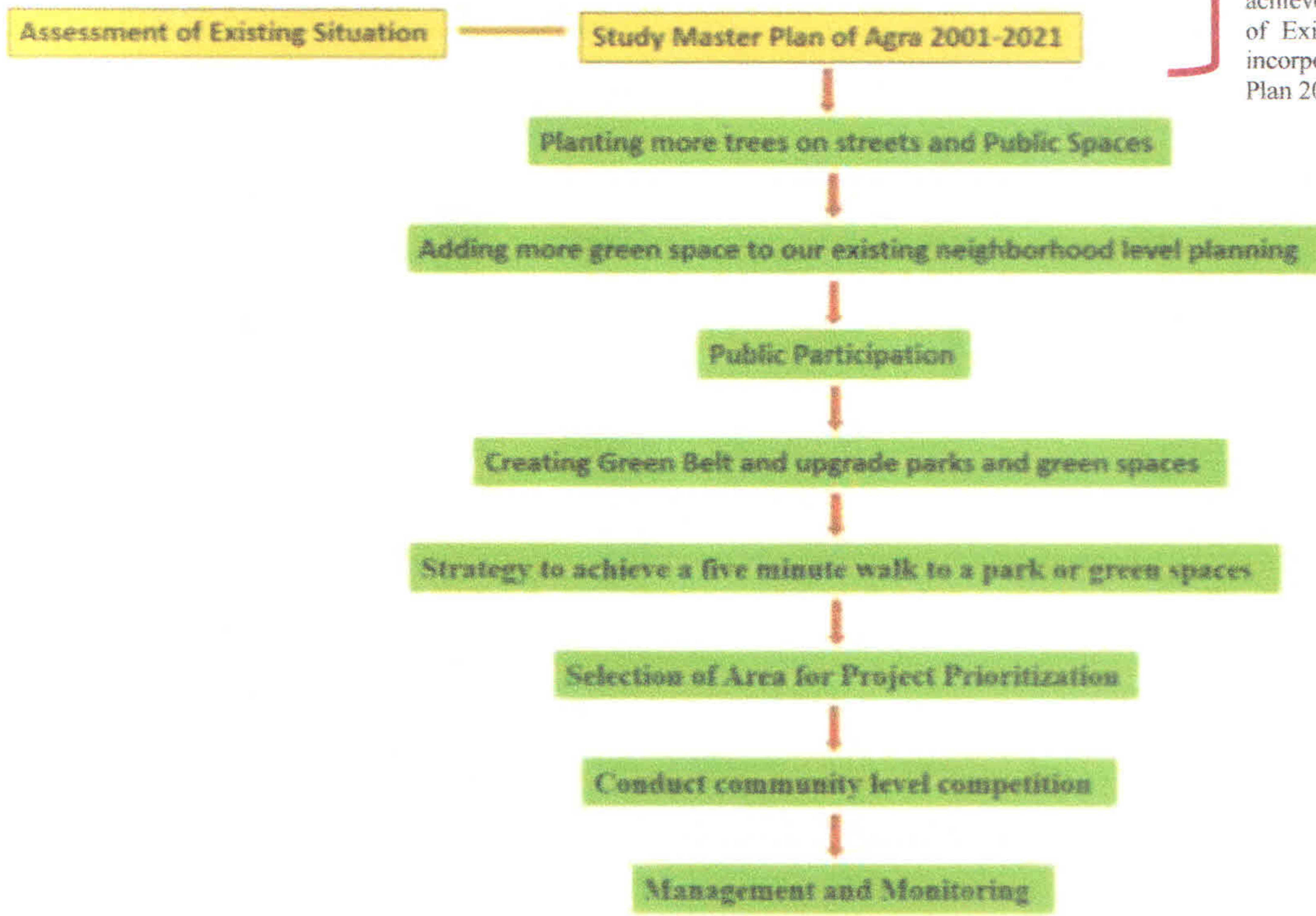
Long Term Strategies to increase green cover in the next few years to come:

- ✓ Accessing to nature through green space will require planting more trees on our streets and public spaces, as well as adding more green space to our existing neighborhood level planning and projects. Since these actions happen at a local level, a robust public engagement process where local community groups, residents, educational institution and business community are actively involved in this transformation will be necessary to achieve success.
- ✓ Creating Green Belt and upgrade parks and green spaces
- ✓ Strategy to achieve a fifteen minute walk to a park or green spaces includes building new parks in park-deficient areas and upgrading street, footpaths walk ways into green spaces through additions such as new trees, public art etc.

- ✓ Strict implementation of environmental policies and bye-laws are necessary to ensure improvement in green spaces.
- ✓ Selection of Area for Project Prioritization: Localities with number of park, doable space availability and tree-density in particular area will be selection parameter for area and project prioritization.
- ✓ Every year two localities will be selected through community level competition process. This competition will be conducted by third party facility management agency such as NGOs, Media House, private agencies or other consulting agencies. The one-year goals for these localities are to ensure:
 1. Maximum utilization of open space in a street or park is planted with tree.
 2. Encourage private/Institutional property owner for tree plantation in their land with own O&M.
 3. Increase in per capita open spaces ratio.
 4. Fifteen Minute Walk Park and place making.
 5. Inclusion of features for children, elderly and physically challenged.
 6. Street plantation and green place making in selected area.
 7. Promotion PPP driven O&M mechanism for selected area.
 8. Promotion of PPP based park development scheme for select area.
 9. Participatory planning process and Idea camp for place making for selected area.
 10. Community based Street art and façade improvement project for selected area.
 11. Improvement of existing plan as per green growth approach strategy for selected area.

Creation of Detailed Project Report: PDMC appointed under AMRUT Mission and ULB will develop comprehensive, integrated detail project report for city. This project report will consist of:

1. Preparation of inventory for Green Cover in the City Limits including details of
 - Area of Green Cover
 - Type/Level of Park,
 - Land Ownership,
 - Development Status (Boundary, landscaping, Furniture's, Lighting, other feature),
 - Operation and Management Status (Maintenance Body, User Charges if any)
 - Master plan area for green and recreation use and its current situation.
 - Other allied Data
 - Assessment of Existing Proposals
 - Proposed Green Cover in Development Plan
 - Proposals for Development of Green Cover in various Schemes.
 - Convergence plan with various government schemes
 - Proposed Green Cover in Nagar Palika.
 - Assessment of available resources for Development and O&M of Green Cover.
 - Funding sources and Cost involved in development and Management of Green Cover by public bodies, NGO, and Private bodies.
 - Human Resources and Physical resources available with various departments for Development and O&M of green areas.
2. Identification of GAP to achieve at least 15% of Green cover in the City Limits.
3. Preparation of project based on various Plans (Implementation plan, financial plan, Resource plan, O&M plan, Convergence plan etc.)
4. Detail Project Planning for Green Space required to cover the GAP
 - Area of Green Cover Required
 - Bifurcation of proposed green cover in various type of Green cover
 - Identification of resources required for development (Land, Financial resources and Human Resources)
 - Detailed estimation and drawing design
 - Formulation of Strategy/Model for development, based upon the available resources.
 - Strategy for development of Neighborhoods Parks and Tot-lots. (PPP shall be explored).
 - Strategy for development of City Park and Regional Park.
 - Strategy for development of green buffer spaces and other green space.
 - Identification of roles and responsibility of various authorities.



15% of the Green Cover is achieved through analysis of Existing situation with incorporation of Master Plan 2001-2021.

8. CONCLUSION:

According to the study of present status of Green Cover in Agra and analysis of Master Plan 2001-2021 of Agra, it has been found that by 2021 Agra city would be able to achieve 15% of Green Cover without any specific intervention. In-order to achieve this percentage and maintain this uniform growth in green spaces it is necessary for individual departments to maintain their existing green cover efficiently, keep separate data and monitor the growth on a regular basis.

As per existing scenario Green Cover per person in Agra city is 10.67 sq.m and after achieving 15% green cover it may reach upto 13.34 sq.m (census 2011) which is more than minimum green cover required per person by WHO ie. 9 sq.m. per person.

Population of Agra City = 15,85,704

Total Area Under ULB = 141 sq.km (14,10,00,000 sq.m)

Total Green Cover (12% +3%) = 21.15 sq.km (2,11,50,000 sq.m)

Existing Green Cover Per Capita = 10.67 sq.m (Census 2011)

Proposed Green Cover Per Capita by 2021 = 13.34 sq.m (Census 2011)

Strict implementation of rules and regulations, policies, bye laws and guidelines from National Green Tribunal and other important national and international guidelines should be taken care off, on urgent and regular basis. Penalties/ charges should be levied on polluters in accordance with the Environmental Protection Act, 1986 and other related Acts under Constitution of India. It is recommended that the incentives to encourage green cover and penalties for discouraging polluters should be revised.

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