

Taj Trapezium Zone PREPARATION OF VISION DOCUMENT

First Draft Report

Volume II

July 2018



Annexures

Table of Contents

Annexure 1.1: Appraisal of Projects	2
Annexure 2.1: Ambient Air Quality & Water Quality Data of TTZ	48
Annexure 2.2: Location of Air Quality Monitoring Stations in TTZ Agra	63
Annexure 2.3: List of Vegetation Found in TTZ	64
Annexure 2.4: List of Wildlife Present in TTZ as per Working Plan Document	71
Annexure 2.5: List of Industries - Classification into Red, Orange and Green	76
Annexure 2.6: List of Environmental Clearances given to Projects in TTZ	104
Annexure 2.7: Chronology of Supreme Court Orders	111
Annexure 2.8: Major Projects Proposed in TTZ	120
Annexure 2.9: Projects as per CEMP TTZ 2013	121
Annexure 2.10: Report of the Parliamentary Committee on effects on	
pollution on Taj, 22nd July 2015	124
Annexure 2.11: Recommendations as per MoM with Stakeholders on	
04-01-2018.	143
Annexure 2.12: Carrying Capacity Based Planning for Cities – Concept	
and Procedure	145
Annexure 3.1: Issues at Regional, City and Precinct Level	151
Annexure 4.1: Estimation of emissions from vehicular sources	268
Annexure 5.1: Works undertaken by Archaeological Survey of India at Taj	
Mahal during the last six months	270
Annexure 6.1: Review of Master Plans for cities and towns in TTZ	274
Annexure 6.2: Summary & Review of Other Relevant Documents	284
Annexure 6.3: Projects envisaged by various agencies	300
Annexure 7.1: Strategies and Recommendations for Urban Planning	304

Annexure of Chapter 1

Annexure 1.1: Appraisal of Projects

1.1a Environmental Impact

		Time			Pos	itiv	e Im	pact		Negative Impact				ct	
S.No	Name of Document	Frame	Status	Project - Key Components	EP	a D	₽	웃	ΩN	EP	U	⊒	HC	OD	Remark
1.	Firozabad-Sikohabad Master Plan	2031	Ongoing	Sewerage: Proposal of Sewerage Treatment Plant Proposal of Sewerage Network Drainage: Covering up of Drains Avoiding Disposal of Solid Waste in Drains Solid Waste Management: Stopping Disposal of Waste in Drains Placing of Dustbin at Various Spots Water Harvesting: Developing area around Water Bodies as Cultural Sites Geological/ Hydrological Analysis of area before any new construction to know about it recharging capacity Plantation of Trees and Plants (Less Water Consumption) along Roads and Parks Rooftop Rain Water Harvesting	V V V V V					√ √					Construction Pollution Improving Health Issues
2.		May 2010		Road Related Project:						√					Helping in easing out traffic movement, reducing frequency thereby helping in reducing vehicle exhaust emission in TTZ, improving ambient air quality Construction Pollution Construction Pollution

			 Prevention of solid waste dumping into storm water drains Construction of Cross Drainage work 		٧	
3.	Air Quality Assessment and Source Apportionment Study in Firozabad	April 2016	Controlling dust emission from furnaces in the glass industry through techniques like Fuel Gas Recirculation (FGR) and Low NOx Burners and bag filter system Regular Ambient Air Monitoring should be carried to assess the level and tracking the reduction in pollutants levels			Environmental Protection
4.	Development of New Industrial Estate for Shifting of Polluting/ Non-Conforming Industries at AGRA (Progress Report)		Recommendations as per Layout plan which is not available		-	-
5.	Environmental Management Plan	Januar y 2002	 Heritage Corridor: A suitable Greenbelt around each of the monument at least 100 meters Cultural Zones to be created within heritage corridor Pedestrian zones within each core activity area and adequate parking areas for each core area 			Extension of Green Area
			Old Residential Areas in the Central City: • Improvement of the building exteriorly • Improvement of Physical Infrastructure ✓		٧	Construction Pollution
			Industrial Area: • A suitable greenbelt around each industrial area to the extent possible. • Greening up to 25% of the total area			Extension of Green Area
			Road Network • A network of new roads is proposed, including bypass roads		٧	Construction Pollution
			DG Sets: • The usage of fuels other than 0.05%S for DG Sets should be banned in the city Drainage and Sewerage:			Reduction of Air Pollution

			 Drains should be tapped through trunk sewers and treated at downstream of Taj Mahal. Branch sewers should be laid connecting these truck sewers. Green Belt should be built along major drains Extension of Green Area
			Solid Waste: • Residential societies to ensure collection and disposal to the collection center • Adequate collection bins to be placed within the reach of people • Frequency of collection and disposal to be improved through additional vehicles. Clean and Healthy Environment
6.	City Development Plan (CDP) - Agra	August 2006	Water Supply: • Extending Water Supply Network • Arrest and Reduce unaccounted for water to permissible limit of 15% by undertaking leak detection study • Adopt preventive maintenance rather than break-down maintenance
			Sewerage: • Extending Sewerage network to unserviced areas • Rehabilitating existing sewers • Provision of Public Toilets in the Slum Area ✓ Storm Water Drainage: • Increase Capacity of Drains • To repair dilapidated drains • Construction of tertiary drain
			Solid Waste Management: • Waste Segregation and Reuse • Adequate collection and transportation facilities • Maintenance of collection bins Road and Transportation:
			Noau anu Transportation.

			Improvement of Road Geometrics, Internal Road Network and Transport Facilities	
			Environment: • Sustainable Riverfront Development • Preservation and Conservation of water bodies and development of new parks • Conservation of Ground water resource by adopting Rainwater-Harvesting Technique	Conservation of Environmental Resources
7.		Decem ber 2016	 Emission from Mathura Refinery and glass industries should continue their efforts in keeping their emission within the prescribed limits Stagnation of river water and disposal of solid wastes and untreated waste water into the river causing water pollution should be avoided 	Reduction of Air Pollution Clean Water Bodies
8.		Decem ber 1997	 Efforts should be made to minimize the existing pollution from sources close to the monument Replace the present coal based locomotives with diesel based locomotives Industries should not be located on north-west of the Taj Mahal and relocation should be done in an area south east of Agra beyond the Taj Mahal 	Expected to reduce SO ² and particulate matter level Emission from these industries will not in the direction of monument
9.	Comprehensive Mobility Plan (Draft Report)	Decem ber 2017	 Road Improvement Junction Improvement Area Traffic Improvement Public Transport Improvement Non-Motorized Improvement 	Pollution Reduction Construction Pollution

1.1b Heritage Impact

					Pos	itive	Impa	ct		Ne	gative	lmp	act		Remark / Recommendations																						
S.No	Name of Project/Plan	Time Frame	Status	Key Components	EP	UP	<u>م</u>	£	an	EP	UP	TP	£	an																							
1.	Agra Master Plan	2021		1.2. Historical narrative				٧		_			-		The historical narrative of Agra mentions history from 11 th C encompassing Lodhi, Mughal, colonial layers in Agra.																						
	Prepared by : Agra												٧		The history is confined to personalities and periods where as structures of significant period should emerge out of the history which should be integral part of the city planning.																						
	Development Authority			2.5 Bazaar Street									٧		There is a proposal of road widening in several areas with in historic precinct such as in front of water works chowk, which was part of historic gardens on west bank, Lohamandi which has several historic structures. Already there are gardens where road traverses through the garden, further road widening can lead to loss of heritage forever.																						
				2.5 Reallocation of wholesalers from Lohamandi and Jama Masjid Area.								2	٧		There is a proposal of reallocation of wholesalers from the historic areas of the town. These wholesalers cater to retail shopkeepers of Raja Mandi Market area. These shopkeepers might be here since decades and this reallocation would impact the traditional management systems as well as the cohesive culture of the core town. There should be a detailed listing of tangible and intangible asset. Each asset has a particular significance, which adds to the character of the historic precinct. The occupations if listed and add to historic character of the space should not be reallocated.																						
			•	2.9 Tourism – proposal for linking the river front structures through adequate movement plan and road network											To reduce the impact of tourism on Taj it is necessary to provide access to other significant sites of the Taj precinct.																						
																											2.9 Tourism – Provision of Barrage on down stream.)							٧	
								2.9 Tourism – Provision of Barrage on down stream and provision of water entertainment and recreational activities									٧		Providing any recreational and tourism activities in the river might attract more number of tourist which is hazardous for the natural and cultural resources of Agra city and its surroundings.																		
				2.9. Tourism – Proposal of national parks on north of the Taj to make it tourist attraction.									٧		Specific areas are not designated. The proposals for each garden on the north of the Taj is to be site specific so that no garden remains are damaged in process of afforestation.																						

2.9 redevelopment and beautification of Taj Ganj Area to make it a handicraft and cultural center					٧	The proposal of redevelopment and beautification might lead to massive interventions such as road widening, pavers, inauthentic interventions on <i>chowks</i> and <i>chaurahas</i> . The Taj Ganj area should be proposed as an Urban Conservation Area. It requires a holistic approach integrating urban design, conservation, traffic management adhering to sustainable development and cultural tourism models. The mapping of tangible and intangible assets, provision of adequate amenities, conservation of remains and interpretation of the Taj Ganj area, Community awareness and outreach programs, inclusive development to be included as part of urban conservation.
2.10. Protected Monument and Heritage zone		V			٧	The heritage structures such as city gates as well as the historic residential and commercial areas are mentioned in the master plan and identified as part of heritage zone It is important to list these structures and notify unprotected structures by a law under local government. It mentions that historic settlements had narrow lanes; therefore these narrow lanes are part of historic character of the city and have historic structures should not be allowed for the road widening. Only ASI protected monuments are listed in the plan.
2.10 Taj Heritage Zone: Proposal 1 : Reallocation of commercial entities from the heritage zone.		<			V	The commercial structures are proposed to be reallocated. The commercial activities in many of these areas are identified as of high historical significance and are economic drivers of the city. To 'Reallocate' these activities is intervening in the traditional system of city functioning. The spaces in historic areas address the activities in a very subtle way and the relation of these spaces with activities are important to be mapped and identified rather than reallocation of the commercial activities. There are few commercial activities, which are impacting the historic spaces and functioning which can be considered for reallocation.
2.10 Taj Heritage Zone : Proposal 2 : The residential areas are not suggested to be removed from the zone. 2.10 Taj Heritage Zone : Proposal 2 : As these		٧				considered for redilocation.
residential areas are in heritage zone there have to be guidelines for development for these areas 2.10 Taj Heritage Zone: Proposal 2: ASI restricted and prohibited zone of 100mt and 300 mts need to be demarcated on ground.		v				

	2.10 Taj Heritage Zone : Proposal 2: with in ASI demarcated prohibited area, structures not more than 3.75 mt height to be permitted in residential areas and in the rest of the zone not more than 7.5 mt height should be permitted 2.10 Taj Heritage Zone : Proposal 3: reclamation of river and the river bank by construction of barrage.	Reclamation of riverbank and reviving the river is significant. But constructing a barrage will impact the spatial integrity and visual connectivity of the structure. More over the villages and settlements on down stream will be impacted. The river can be revived by other means such as afforestation around river, desilting, solid waste management.
	2.10 Proposal 4: Mohtah Pagh	
	2.10 Proposal 4: Mehtab Bagh to be developed as park	The plan proposes the historic garden to be developed as park. The garden needs landscape conservation including the excavations, plantation of original species, removal of additions and alterations post detailed surveys and analysis. The term "park" might be considered as any contemporary park which can be detrimental to the site
	2.10. Proposal 6: To revive water in Yamuna along Taj by making a barrage and to provide water sports and boating as recreational activities	Providing water sports is other way of encouraging more people with in the heritage precinct. The footfall of the precinct is already very high. Threshold capacities of the areas need to be worked out. Other than this, providing the tourist recreational activities will require more infrastructure and amenities where as these areas need to be retained with green plantation and minimal construction and hardscape areas.
	2.10 Proposal 7 Heritage zone needs to be connected by a road network to make the entire zone accessible by the tourist	On one hand where the proposed circuit to connect the whole area is important, but it requires a detailed transport management and mobility plan, where the city is analyzed in detail to identify pedestrian connectivity. The interventions should promote maximum pedestrian movements and BOVs. Segregation of traffic is mandatory. With proposal of connectivity, road widening and cutting through historic areas can be detrimental for the residential heritage and the remains of the gardens.
	2.10 Proposal 8 : the issues of congestion and lack of	The pedestrian routes and addressing the lack of management is appropriately listed in the master plan.
	management in the Taj Ganj historic area adjacent to Taj Mahal should be addressed to promote tourism and most of the routes should be retained as pedestrian routes	the residents. Tourism can be considered as a by-product of the benefits of these holistic interventions.
	2.10 Proposal 9 : Proposal 9 of the heritage zone proposes to	The proposal is extremely detrimental for the settlements and the villages downstream. This proposal is encouraging the cumulative

				1 1			1	
			tap the nallahs of the city and					impact of pollution of Agra to get into the other settlements
			empty them into the river after					downstream as well. The idea of protecting Agra and Taj with such
			the barrage which is proposed					interventions might impact the villages at regional level and the
			downstream					impact because of the tourism, lack of solid waste management, lack
								of afforestation schemes, lack of STPs functioning and many more will
								be seen on environment and health of many more districts and cities.
			2.12. Entertainment and open					Area across the river from Taj Mahal is highly sensitive area for
			areas: Proposal 2.12.5 area					archaeology and heritage. From Gyarah Sidhi to Mehtab Bagh there
			across the river form Taj Mahal					are several remains along the river and few found in excavation just
			is proposed to be developed as					along the Mehtab Bagh to the north. The area cannot be identified to
			National Park, and with an			٧		be used as national park with no guidelines and detailed analysis.
			objective to provide					Appropriate heritage impact assessment, heritage management
			recreational activities					plans and detailed conservation plans are required for any kind of
			recreational activities					interventions in these areas.
2a.	Mathura -	2021	Section: Main historic sites of					Mathura and Vrindavan, the two significant settlement of the Braj
	Vrindavan		Mathura : Shri Krishna					Mandal has diverse repositories of the cultural heritage beyond the
	Master Plan –		Janmasthan, Vishram Ghat,					identified sites which needs to be documented, mapped and listed.
	2021 Part A		Dwarikadheesh Mandir, Gita					
	Mathura-		Mandir, National Museum					
	Vrindavan		Main historic sites if Vrindavan					
			: Shri Banke bihari Temple, Shri	V				
	Prepared by :		Ranji Mandir, Radhavallabh					
	Mathura		Temple, Nidhivan, Seva Kunja,					
	Vrindavan		Madan Mohan Temple,					
	Development		Gopinath Temple, Govinda Deo					
	Authority		Temple.					
	,		Section 3.11.2: Protection and					
			Conservation of delineated					
			Heritage Zones of Mathura and	V				
			Vrindavan have been identified					
			in the master plan.					
			Heritage Zone of Vrindavan					Identification of heritage is limited to temples and ghats. Integration
			includes Banke bihari Temple,					of havelis, vernacular houses, dharamshalas, gardens, mathas etc.
			Radha Krishna Temple, Madan					, , , , , , , , , , , , , , , , , , ,
			Mohan Tempek, Jugal Kishore					
			Temple, Govinda Deo Temple,					
			Shriji Temple, Shri Ranji					
			Temple, Jagannatha Temple,	\ \				
			Shahji Temple, Nidhivan,					
			Ranapat Ghat, Govinda Ghat,					
			Kalia Dah <i>ghats</i> , Chir Ghat and					
			Keshi Ghat including other					
			temples located in the area.					
			temples located in the area.					

Section 3.11.2: Vrindavan Heritage Zone - Proposal for detailed Conservation and Revitalization plan of the historic sites located within and outside the heritage zone while removing the encroachments and maintenance upkeep of the monuments.		٧				Conservation and Revitalization should not be misinterpreted to carry on beautification works compromising the authenticity and integrity of the character of the site.
Section 3.11.2: Vrindavan Heritage Zone-Maintenance and up-gradation of the ghats located in the heritage zone		٧			V	Architectural character and material integrity of the historic structures should not be compromised.
Section 3.11.2: Vrindavan Heritage Zone - Conservation and Protection of the architecturally significant built heritage.		٧		0	٧	Conservation should not be misinterpreted to carry on beautification works compromising the authenticity and integrity of the character of the site. Architectural character and material integrity of the historic structures should not be compromised.
Section 3.11.2: Vrindavan Heritage Zone -Provision and Up gradation of infrastructure facilities in the heritage zone		٧			٧	Need of Urban design guidelines
Section 3.11.2: Vrindavan Heritage Zone- Pedestrianisation of the streets network and provision of parking on the periphery of the heritage zone at appropriate location		٧			V	Need of Urban design guidelines
Section 3.11.2: Vrindavan Heritage Zone- Conservation of open spaces in the heritage zone, plantation of trees and provision of visitor amenities.		٧				
Section 3.11.3: Proposal for Conservation and Development control through Preservation, Renovation, Improvement and Environmental up gradation (tree plantation)		v				

			Section 3.18: Water Harvesting Mapping, Protection and conservation of the natural water bodies, ponds, and pokhars. Development of recreational area around these water bodies for public use.		V			٧	The historic Kunds in Mathutra and Vrindavan were also part of the historic water conservation and recharge system following indigenous knowledge system of the drainage networks and slope analysis. It is recommended that these historic kunds should also be identified, mapped and protected along the natural water bodies. The conservation of these <i>kunds</i> should be sensitive towards the architectural character, design and material authenticity. For example Brahma Kund has been completely transformed from its historic design. The development around the water bodies for recreational purpose requires sensitive design development, indigenous plantation scheme, brick on edge paving or stone paving (as recommended in master plan)
			Section 3.26 : Disaster mitigation		٧		2		The master plan only identifies that the area falls under the earthquake prone region and is located in the flood prone area. Risk preparedness plan needs to be prepared for Mathura and Vrindavan
2 b	Mathura - Vrindavan Master Plan - 2021 Part B Kosi Kalan, Chata, Chaumuhan, Nandagaon Prepared by : Mathura Vrindavan Development Authority	2021	Kosi Kalan- Ratnakar Kund , Bhabhai Kund, Gomti Kund and Mikhiya Kund, Sarai Shahi, and Market, Animal Fair every tuesday Chata — Sarai constructed by Sher Shah Suri or Akbar Chaumuhan — Kos Minar , Kund, Brahma Temple Nandagaon — Nanda Rai ji Temple, Narsingha Temple, Gopinatha Nityagopal Temple, Girdharinandan Temple, Nanda Nanadan Temple, Radha Mohan Temple, Mansa Devi Temple, and Yashoda Nanadan Temple, Udhav Kyari, Pawan Sarovar, Kokila Van.		V			٧	

			Recommendation for: - Identification and conservation of natural waterbodies, reservoir and ponds and prohibition on change in land use. Development of recreational area around these water bodies for public use. It is proposed to undertake Geological and Hydrogeological Surveys before commencement of the new plan in the area.	V			Though the identification and conservation of water bodies is proposed in the master plan, the mapping of water bodies is needed to inform the future development in the areas while addressing the water supply needs in the city. Conservation works should be undertaken by technical experts to ensure the fabric, character and edge of the water bodies are developed without compromising the ecological significance. The development around the water bodies for recreational purpose requires sensitive design development, indigenous plantation scheme, brick on edge paving or stone paving (as recommended in master plan) It is advised that while undertaking plantation of trees, the indigenous species to be preferred with high water holding capacity. Implementation of these recommendations on ground is needed.
			Proposal for plantation scheme. Section 4.10 Tourism	v		v	While Nandagaon is identified as an important historic settlement with increasing tourist footfall from 1,486,355 in 1998 to 1,654,266 in 2002 (Source: Tourism office, Mathura) the other settlements such as Kosi, Chata and Chaumuhan also have points of interest that can be developed as part of sustainable rural tourism.
2 c.	Mathura - Vrindavan Master Plan - 2021 (Part C) Goverdhan - Radhakund Part I Prepared by : Mathura Vrindavan	2021	Section 1.1.3 Historical and Religious Background Goverdhan — Giriraj Parwat, Hari Gopal Temple, Dauji Temple, Punchari ka Lauta Temple, Nansi Ganga, Kusum Sarovar, Narad Kund Radhakund - Radha Kund and Shyam Kund with ghats			V	The section identifies few significant historic structures as well as the intangible heritage

	Development Authority		Section 4.7 Ashram , Matha and Religious use 169.02 Hectare of land (10.47% of the proposed master plan area) is allocated for the development of Ashram, Mathas and religious use.				٧	Ashrama and Mathas were the historic infrastructural facility developed for the pilgrims. The old and historic ashramas and mathas with other infrastructural facilities which are in ruinous state of conservation needs to be identified and restored to cater to the increasing demand of the pilgrims, hence setting an example for adopting a sustainable approach for development.
			Section 4.9.2 Forest Area and Section 4.9.3 Green Cover 104.38 hectare land is kept reserved for the forest. No construction is permitted in the existing green cover between Goverdhan Parvat and Parikrama marg.	v				
			Section 4.13 Water Harvesting			2		Though the identification and conservation of water bodies is proposed in the master plan similar to Part A and Part B of the master plan, the mapping of water bodies is needed to inform the future development in the areas while addressing the water supply needs in the city.
				٧			٧	The development around the water bodies for recreational purpose requires sensitive design development, indigenous plantation scheme, brick on edge paving or stone paving (as recommended in master plan)
				5				It is advised that while undertaking plantation of trees, the indigenous species to be preferred with high water holding capacity.
			Section 4.14 Archaeologically Significant Sites				٧	Implementation of these recommendations on ground is needed. Two State protected monuments Govardhan ki Chattriya and Kusumvan Sarovar with Chattriya are mentioned as archaeologically significant sites. There are more than 300 tangible and intangible heritage in Govardhan and Radhakund which requires to be mapped and integrated with the master plan and other development proposal to protect the heritage assets as well as to promote tourist destinations within these two settlements.
3.	Hathras Master Plan	Till 2021	1.2.3. Historical narrative	٧				Encompasses Ancient, Jaat, Mughal and British history in Hathras.
	2021						٧	Where as the history should lead to identification of historic areas and precinct and the significant areas should be integrated into master planning.
			3.4.1.Bazaar Street Proposal				>	Proposes road widening from Clock tower to Karbala almost 13-09 Hectare area is designated for the same. The road is a historic precinct with several heritage structures having facades of high architectural

									value. The road widening will lead to losing these significant structures.
			3.9. Proposal of Khetriya Park		٧				83.86 hectare area is designated for park development in the extensions proposed in Hathras.
								٧	Hathras is known as city of <i>Bagichi</i> and the historical narrative of master plan also mentions the same briefly. These are not listed in the master plan in detail. These areas add to form a big chunk of green space with in dense settlement. To develop these areas as green open spaces for community should be included as proposal of parks in Hathras
			3.15. Ponds and kunds should be identified and should not be put to any use					٧	The plan proposes to retain the ponds with in district boundaries. The complete listing of kunds and ponds has not been undertaken which could be part of process of identification of these ecological resources.
			3.15 area around pond is to be put to entertainment and recreational use					٧	Largely such spaces are interpreted to be used as amusement parks and tourist hub, which is detrimental for the ponds and kund. These ponds and kunds are water recharge systems and then soft scape around then needs to be protected. The ponds with surrounding spaces should be identified as ecological spaces, which can act as green areas for the community serving as recreational and leisure spaces.
			7 Proposal for Plantation: roads and parks and open spaces should be planted with trees that require less water and help in developing green belt		٧			٧	The proposal of plantation is ecologically very sensitive The master plan should include the name of the trees which should be planted and the criteria should be indigenous trees, which have good foliage and are either fruit bearing or key species such as jamun, mango, neem.
			Tourist infrastructure	C				٧	The plan identifies Hathras as a city on periphery of Agra and Mathura, which are high tourist footfall areas. Therefore there is a land allocated for the hotels for overnight stay in Hathras. Hathras was a huge trade center and still has cultural industries such as hing, colors production and brass industries, which can be an incubator of livelihoods and trade for the city. There are several Bagichi, temples which could be a halt point for people going to Agra and Mathura and the people who are associated with Hathras for trade.
4.	Firozabad – Shikohabad	Till 2031	Historical Background		٧				Historical narrative includes the history of Raja Todar Mal, Colonial and glass industries of Firozabad.
	Master plan 2031							٧	It lacks the Mughal period details. History also doesn't lead to identifying historical structures areas and precincts, which should be integral part of the planning.
			3.8 list the sites of tourist importance which includes the Dargah and temples					٧	The variety of heritage in Firozabad should be generated from the historical narrative, and detailed inventories to include all layers of history as cultural tourism destinations.
			Tourist infrastructure					٧	The plan identifies Firozabad as a city on periphery of Agra and Mathura, which are high tourist footfall areas. Therefore there is a land allocated for the hotels for overnight stay in Firozabad.

			3.5 Industries Proposals for natural gas and other remedies for the glass industries. TERI report on use of substitute materials for running of industries	V			Firozabad has huge glassware industry, with improved condition of the craftsmen the industries can be more formal and Firozabad in itself can be developed as trade center for glassware and a halt point to Agra and Mathura.
5.	Bharatpur master plan Bharatpur Master Plan 2023 Prepared by : Nagar Niyojan	2023	Section 4.5(1): The master plan identifies Jama Masjid, Lohgarh Fort, Sujan Ganga (moat around the fortification wall of Lohgarh Fort), Laxman Temple and Ganga Mandir as tourist attraction that can be developed.	V		٧	The city has a varied range of built heritage structure within the fortified settlement such as gates, street, havelis, palaces, bastions, ghats etc. for which a database is required to be generated through mapping and inventorization.
	Vibhag , Rajasthan, Jaipur		Section 5.2: The market street inside the fortification wall from Kumher Gate to Mathura gate, Bada Bazaar, Atalbandh mandi, Anah Gate market streets are designated as main CBD area where in main historic structures identified in the proposed landuse plan 2023 are Jama Masjid, Laxman Mandir, Ganga Mandir, Hospital area and Gol bagh area		2	٧	The development of the market street as main CBD area of the town should not encourage the road widening activities in the historic core areas and market street.
			Section 5.4(2): No development is proposed in the State Reserved Area of Sewar Fort on Sevar road and Kanjauli on Deeg Road.	٧			The fort to be protected as a heritage structure.
			Section 5.6(5): significant archaeological, historic, religious structures need to be designated as protected monuments and area around them to be developed for tourism infrastructure.	٧		٧	A heritage impact assessment should be carried out before commencing any tourism infrastructure development works around the protected as well as unprotected sites.

	Section 5.7(3): road widening activity is proposed in the main market areas by removing encroachments on the road such as platforms, ramps etc. Section 6.1: No construction/development is allowed over the water bodies, canals, drains, and slopes etc. even if the water body has dried up.	v	The market street of Bharatpur has high concentration of the heritage structure, it is recommended that the structures should not be demolished for the road widening proposals. Need for traffic management plan to be developed in a holistic manner without undermining the historic fabric and character of the streets. GIS based documentation, mapping and inventorisation of the historic water management system that includes water bodies, moat, canal, drains etc.
6. Comprehensi ve Environmenta I Management Plan for Taj Trapezium Zone(TTZ) Area Prepared by: CSIR-National Environmenta I Engineering Research Institute (NEERI) December 2013	Section 3.2.2.2 Water Availability in TTZ The project for construction of Agra Barrage about 8km upstream of Taj Mahal has also been proposed by UPJN which has not been started yet. This has been guided by the Hon'ble Supreme Court order. The barrage has been proposed to help the authorities in controlling the water level in river Yamuna downstream, which is said to be desirable for safety of the Tajmahal. 3.3.2.2 Policy Decisions - A barrage be constructed downstream of Taj so that Yamuna river retains water and the river is used for the recreational purposes. - River Yamuna should be made pollution free by establishing treatment plants. - In order to reduce the water losses during distribution, the network needs to be improved and		Having high water level at the river edge of the Taj Mahal, without addressing the serious issue of water pollution in the river is not recommended. First and foremost the outflow of sewerage into the river needs to be controlled. Only treated water from STPs to be discharged in the river which requires adequate no. of STPs in working condition with well connection sewer network in the city. Cleaning of riverbed requires dredging and de-silting which will help in addressing the water pollution and will also help in increasing the water retention capacity in the river naturally as the de-silting will help in increasing the depth of the riverbed. Internationally there are examples wherein countries are demolishing the barrages and dams to adopt an ecologically sensitive

worn out/rusted pipes	development approach for the restoration of river¹ to protect the
needs to be replaced	natural ecosystem, biodiversity, flood management and landscape
- The sewer flowing in	development.
drains be treated at	
	I I I I I I I I I I I I I I I I I I I
suitable locations and the	
treated sewage discharged	
downstream	
- As far as possible on both	
the sides of open drains a	a
three metre wide strip be	
reserved for tree	
plantation	
plantation	

¹ River restoration refers to a large variety of ecological, physical, spatial and management measures and practices. These are aimed at restoring the natural state and functioning of the river system in support of biodiversity, recreation, flood management and landscape development.

			Section 6 Comprehensive Environmental Management and Action Plan for TTZ Section 6.2.2.2 Preservation and Conservation of Water Bodies and Development of New Parks: Out of the total of 41 water bodies (covering 0.45 km² area), 13 water bodies, like Guru ka Talao, Totaka Talao, etc. have been completely dried and land reclaimed for developmental activity. The Paliwal Park and Sardar Patel parks also have water bodies located inside, which should be	V			Though the plan recommends the preservation and conservation of water bodies but the urban design guidelines for the development needs to be formulated. The land reclamation of dried water bodies should be prohibited
			preserved and developed. 6.2.3 Recommendations in other Documents The report endorses the recommendations proposed in the 'Comprehensive Action Plan for Critically Polluted Industrial Clusters of Agra' prepared by U.P. Pollution Control Board, September, 2011 should be fully implemented for environmental improvement.	V			Implementation of the proposal on ground is critical.
7.	HRIDAY CDP A project of MOUD, Government of India City Anchor:	2017	Historical narrative			V	Historical narrative is identified period wise upto 550 AD and post that there are structures identified in various period. There is a huge gap between 550 AD and 1300 AD. The tangible assets identified in different periods are also not comprehensive and limited to Vishram ghat , Jama Masjid, Museum and Refinery. A comprehensive historical research is required to identify various typologies and structures built in different periods. Though it is later done in chapter 3 which is not linked with historical research
	, Braj Foundation		2.5. Forest and Biodiversity 3. Identification of typologies: tangible and intangible assets			V	The document identifies the historic vans of Vrindavan as forest and biodiversity, which therefore could lead us to a very sensitive outcome, that management of layers of historic assets are mandate of various departments and associations and not confined to protected monuments by ASI.

	PROPOSALS Chapter 7 and 8.1 identification of heritage zones and chapter 8 has zone wise proposals for accessibility, electricity, streetscape, Revitalization and development, Tourist Amenities, Infrastructure.						The plan details components extensively where as there are few loop holes such as the proposal of preparation of mobility plan is essential. Though a holistic understanding of the road networks, historic assess, street scape and character of the lanes is important. The plan has to be prepared by transport planners in consonance with the urban designers, environmental planners and conservation architects to avoid any negative implication and implementation on ground.
			V				Parking is proposed behind the Potra kund and at the proposed tourist hub, where as the plan does not talk about the existing use, surroundings, character of the spaces allocated, which is why rationale of selection of the areas is not clear. Proposals of E-rickshaw, trams etc for the internal routes is positive but the internal areas have a huge loading unloading processes in commercial areas. There are private residences and no alternative and compatible ways are proposed to manage the traffic with in the internal areas of Mathura. With narrow lanes in core city, trams will not address the issues. Similarly the underground electric lines are recommended in few
						٧	areas which are of high archaeological significance where it is important to undertake such excavations under supervision of an archeologist and note if any archaeological remains are found it has to be recorded.
	Chapter 9 Creation of shelf projects based on strategies						
	Accessibility and Transportation (All zones compiled)						
	Strategies: To provide and increase the carrying capacity of the exiting roads (Zone 1)	>				٧	The streets of the inner city, specially heritage zones have historical character to them, increasing capacities could lead to road widening and introduction of modern systems making traditional systems dysfunctional. The proposal to increase capacity might not be a value addition for the sites, the holding capacities of sites are also limited.
	Strategies : To provide adequate parking facilities for		٧				The proposal is more adequate for the Zone 2 being residential and
	floating and non floating population. (Zone 1)					٧	commercial area but not included in zone 2 strategies
	Strategies: To increase multi level parking (Zone 1)					٧	To bring cars to the inner core of Potra kund and Jamam Bhumi precinct should be minimized. More infrastructures would encourage more vehicular traffic, which might impact the sites and historic streets, as carrying capacity is low in these places.
			٧				To facilitate the alternative methods of transportation is good.

Strategies: To facilitate alternate methods of transport with in the city such as tram and E- rickshaws (Zone 1) Strategies: To facilitate as should segregate them from pedestrian routes as should segregate them from pedestrian routes	points as well
Strategies: To eliminate rail crossings to avoid conflict (Zone 1) To avoid rail crossings is adequate but alternative me suggested. These crossings are in historic areas therefore flyovers might not be recommendable	
Strategies: To Ease Pedestrian	
and vehicular conflict on the street (Zone 2, 3) Appropriate measures not specified.	
Strategies: To reduce nuisance of animals on the street (Zone 2)	
Strategies : To organize new	
parking facilities for the residents (Zone 2) Being historic precinct it is important to introduce thes with heritage sensitive guidelines.	e facilities but
Strategies: To facilitate access to persons with restricted mobility (Zone 2, 4)	
Strategies: Provision of cattle traps at marked locations (Zone 2) V The proposal is equally valid for the Zone 1 and especiation of the Zone 1 and zone 2 ghats area zone 3 but not included in zone 1 and zone 2	
Strategies: Provision of ramps for persons with restricted mobility and resurfacing of the street (Zone 3 and 4) Strategies: Provision of ramps visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 1 but not incomplete visually valid for the Zone 2 but not i	cluded in zone
Strategies: To provide new organized facility for the visitors (Zone 3) There could be a common parking for the ghats and Chatta Bajaar and Potra Kund multiple parking areas within a short distance.	and another
Strategies: To reduce traffic	
bottle necks caused by encroachments (Zone 3) There is no clarity on if the encroachments are properties in the implication of the same can be undertainty ways which can be detrimental to historic facades, stream and the community.	aken in several
Strategies: To provide safe crossings at railway line (Zone 4 and 5)	
Strategies : To provide	
convenient means of access to Shiv Tal Kund Precinct of Shiv Tal is a historic precinct and cannot b vehicle. By providing ease of access implication on group road widening, provision of vehicular access, which has	ound could be as detrimental
impact on the character of the settlement as well as th	e structure.

Stratogias: Provide preser					1		Lack of clarity
Strategies: Provide proper Traffic management					V		Lack of clarity
Strategies: To provide consistent design (Zone 5)				,	V		Lack of clarity
Strategies: Provision of		٧					Adequate
revamping of existing footpaths along with proper road curbs				,	v		Footpaths have been lately added and have been encroached upon by the shopkeepers. The design is not adequate to accommodate the number of pilgrims during peak season on the pathway. It requires to be dove-tailed with an elaborate pilgrim movement plan with in mobility plan.
Proposal: To prepare a		٧					
comprehensive mobility plan of the zone (Zone 1 and 5)				,	V		The proposal is equally valid for the Zone 2, 3, 4 and 6 as well but not included in the strategies for other zone
Proposal: Design and Development of surface parking area as earmarked in the plan (Zone 1, 2)				1	V	\ >	The identified areas for parking do not detail on the current use, character therefore no rationale of selection of the areas could be determined.
3. Tourist Amenities					T	7	
Strategies: To provide and increase the potential of pilgrim, religious, heritage based tourism (Zone1, 2)					V		The potential of tourism to the pilgrim and tourist destinations is embedded in the significance of the site. The plan does not specify the measures and need of increasing the potential when tourist footfall is already immensely high.
Strategies: To develop the areas in and around the heritage sites, kunds, <i>ghats</i> , temples of high tourism potential and religious significance (Zone1, 2)		X		,	v		The word "Development" has been used previously in several reports and has led to interventions such as embankments of kunds, beautification and providing amusement parks around the kunds and vans. Edges of the kunds need to be specifically retained as soft scape. No development should be encouraged around the <i>vans</i> . Minimal interventions so as to conserve these historic precincts and settlements in their pristine state are recommended.
	>						
Strategies: To provide adequate infrastructure facilities like basic		٧					
amenities in and around such sites. (Zone1, 2)					٧		There is no proposal to formulate guidelines for these interventions
Proposal: Provision of two toilet complexes with facilities for disabled in the zone (Zone 1)		٧					

		T						1		
		Proposal: Provision of resting shelter (Zone1)			٧					
		Proposal: Provision of 2 tourist								
		information kiosks on either			v					
		side of the site (Zone1)			-					
		Proposal: Provision of public								
		addressal system and a public								
		display system at Deeg Gate			٧					
		(Zone1)								
		Proposal : Integrated	\vdash							
		development of a tourist hub								The tourist footfall is because of the cultural assets of Mathura which
		with integrated facilities of								have been listed in the document previously. The local informal
		conveniences, interpretation						٧		souvenir shops are part of that cultural destination of the city.
		center, souvenir shops and								Addition of formal souvenir shop and interpretation center as tourist
		cafeteria (Zone1)								hub might lead to creation of another huge infrastructure with
		careteria (zoner)								massive interventions impacting tangible an intangible assets.
		4. Street Scape								
ı l		Strategies: To provide and								Same as tourism proposal. Inadequate intervention for streetscape
		increase the potential of						.,		
		pilgrim, religious, heritage						٧		
		based tourism (Zone1,2,3,4)							,	
		Strategies: To develop the areas								Same as tourism proposal. Inadequate intervention for streetscape
		in and around the heritage sites,						.,		
		kunds, <i>ghats,</i> temples etc						٧		
		(Zone1,2,3,4)								
		Strategies: To provide adequate								Same as tourism proposal. Inadequate intervention for streetscape
		infrastructure facilities within all								
		the prime streets connecting						٧		
		the heritage assets of the city.								
		(Zone1,2,3,4)								
		Strategies: To provide an								Same as tourism proposal. Inadequate intervention for streetscape
		identity to the 4 chowks.						٧		
		Proposal: Shop front upliftment								Shops might be historic shops and have layers of interventions, which
		 Development and design of a 								can be restored or can be consolidated adopting conservation
		new false façade in front of the								principles. Addition of a façade is not recommended and superficial
		adhoc row of shows on the						٧		interventions are not recommended.
		opposite side of the temple.								
		(Zone1)								
		Proposal: Provision for re-	\vdash	+						
		surfacing of the pedestrianized								
		street making it disable friendly								
		and using local materials of			٧					
		bricks and stone cobbles.								
		(Zone1,2,3,4)								
		Proposal: Provision and	$\vdash \vdash$							
					٧					
		providing street furniture-								

	1		1	1	1			
	benches, bollards at 2 locations, tree guards & signages. (Zone1)							
	Proposal: shop front upliftment	╁┷┼						Shops might be historic shops and have layers of interventions, which
	-conservation of existing							can be restored or can be consolidated by conservation principles.
	•						٧	
	building facades. (Zone2,3)							Addition of a façade is not recommended and superficial interventions
		+-+			-			are not recommended.
	Proposal: Provision of							
	directional & informational		٧					
	signage. (Zone2,4)	.						
	Proposal: Chowk beautification,							Beautification and development have led to loss of historical footprint
	redesign of chowk center						٧	and remains for ever. These terms also lead to massive interventions
	(Zone5,6)							which are detrimental for street character and historic structures.
	Proposal: Graphic art an							
	existing facades of the buildings						٧	
	depicting various Krishna						V	
	Themes (Zone5,6,)							
	Proposal: Provision of seats and							The proposal does not talk about the historic facades, elements,
	benches as resting points		v					height restrictions, authenticity and integrity f the spatial character.
	(Zone5,6)							
	Proposal: Provision for bollards					7		
	and railing for demarcation.		v					
	(Zone5,6)		•					
	5. Upgradation	+-+						
	Strategies: To conserve,	 						
	restore, heritage buildings,			>				
			V					
	sites, kunds, tilas, kilas,							
	ect(Zone 1,2,3,4)	├						
	Strategies: The conservation	1						Lack of clarity
	strategy recommendation will							
	be in sufficient detail to inform						٧	
	decisions and direct the							
	conservation plan (Zone 1,2,3,4)							
	Strategies: Minimal							
	intervention should be the							
	guiding principle for all		٧					
	conservation work. (Zone							
	1,2,3,4)							
	Proposal: Rejuvenation of							
	Potra kund (Zone 1)							
	Total Rana (Edite 1)	+		+	1			
	Conservation of the historic fabric		٧					
			٧					
	mprove access to the kund							That there is no impact during implementation on historic fabric by
1					1	1	٧	providing vehicular access and undertaking road widening, it is
							v	i providing verificatar access and undertaking road widening, it is

	Adaptive reuse Adaptive reuse needs to be supported by the permissible uses to avoidany mis-interpretation such as water sport activities and recreations activities to be introduced around the structure, destroying it.
	Water recharge and maintenance of water levels
	Interpretation and information units (in and around the kund after appropriate archeological and historic research)
	Improved jali design Design needs to be sympathetic with the historic fabric and use.
	Improved pavement and pedestrian movement with public amenities surrounding the kund along the edge of the kund
	Proposal: Upgradation of building facades to preserve heritage character- (Zone2)
	Conservation of the historic fabric
	Adaptive reuse V Adaptive reuse needs to be supported by the permissible uses to avoidance missible uses to avoidance and missinterpretation such as water sport activities and recreations activities introduced around the structure, damaging its inherent values.
	Interpretation and information units (in and around the kund after appropriate archeological and historic research)
	Proposal: Upgradation of built structure on ghats and interface (Zone3)
	Conservation of the historic fabric
	Interpretation and information units (in and around the kund after appropriate archeological and historic research)
	Proposal: Upgradation of Shiv Tal Kund- (Zone4)
	Conservation of the kund water body

			1 1		1	1	
		Restoration of kund structure		V			
		Adaptive reuse				٧	Adaptive reuse needs to be supported by the permissible uses to avoid any mis-interpretation.
		Lighting scheme design				٧	any mis interpretation.
		Interpretation and information units (in and around the kund after appropriate archeological and historic research)		V			
8	Agra Smart City Proposal Prepared by : Agra Municipal Corporation	Section 4 Strategic Focus and Blueprint: This section elaborates on the strategic blueprint of the city for its development over 5-10 years as follows: Sustainable Heritage Tourism enabling inclusive economic growth, Robust Infrastructure provision of basic services (water, sanitation, SWM, Electricity and Housing), Mobility along with safety and Smart, Transparent and accountable		V	2		
		Government. Section 5. City Vision and goals: Vision Statement for the city: City of Taj where history is preserved, environment is pristine, infrastructure is world class and opportunity is plenty – safe place to live, great place to tour.		٧		٧	The brand identity of Agra has been promoted for Taj Mahal since ages. Agra needs a new identity focusing more on the environment and people rather than Taj Mahal.
		Section 5.City Vision and goals: For heritage of the city, the goals are envisaged for the revival and beautification of the existing 48 ASI sites in the city by 2021 along with formulating and implementing urban design guidelines for area around the monuments.		٧		٧	The tangible heritage of Agra is not limited to the ASI protected structures. There are more than 100 unprotected sites as part of the cultural narrative of the city beyond Taj Mahal.

Section 10 Approach and Methodology The area based proposals are structured around: Element # 1 Agra Fort and its vicinity Element #2 Taj Mahal and Tajganj Area Element # 3 Fatehabad Road connecting inner ring road.	V		
Section 11. Key Components Identified Themes: Theme #1 Reconnecting Taj Mahal and Agra Fort	٧	٧	The construction of sky walk between Agra Fort and Taj Mahal will change the visual integrity of the place while adding one more element to the skyline of Agra.
Section 11. Key Components Theme #2 Integrated Development of Taj Ganj Area	V	27	Urban Design guidelines to be formulated should be formulated following the existing character of the area. Implementation of standard guidelines would be detrimental to the specific character existing in the different areas of the city.
Section 11. Key Components Theme # 3 Enhancing connectivity to Taj Mahal through Fatehabad Road	٧		Street-scaping proposal from Mall road to inner ring road (a 6.5 kms stretch Fatehabad road) should follow the urban design guidelines and maintain the colonial character of the road.
Section 12 Smart Urban Form: Revival of Taj Improvement District through re-defining urban morphology by controlling development by urban design guidelines (to be drafted). Preservation of tangible and intangible heritage, renewal of public realm spaces such as markets and vending zone, adaptive reuse of private heritage buildings and turning of nine pillared houses into tea terraces will transform the place.	V	V	While drafting the Urban design guidelines it is recommended to carry out character study of the city in different areas.

Section 12 Smart Urban Form: Rejuvenation of green public spaces, which includes Shahjahan Park, redesign of Taj Nature Walk. Section 12 Smart Urban Form: Up-gradation of 50 houses in Taj Improvement District		V		V	Use of indigenous tree plantation should be promoted.
Section 12 Smart Urban Form: Revival of heritage and facilities to promote tourism through façade improvement of 500 houses and development of tourist facilities such as Mughal Museum , Taj Orientation Centre and International Café street with parking capacity of 300 vehicles		V	2		The façade improvement requires a detailed assessment of the building façade followed by proposal for improvement. It requires careful implementation on ground so as not to transform the character of the streetscape completely. No demolition activities should be recommended in the historically significant area in order to accommodate the proposal for development of proposed tourist facilities.
Section 12 Smart Urban Form: Revival of Taj Improvement District - Development of 5 multi skill development centres to promote traditional knowledge of Zardozi and stone in-lay work.	Ć	٧			

Section 16. Essential Features Achievement Plan: Three heritage circuits are designed in TID:	
Circuit 1 covers 1 kms stretch including 4 major katras - Resham, Jogidas, Fulel and Umerkhand.	-
Circuit 2 covering 1.2 kms stretch including Shiv Temple Anaj Mandi, Basai Kala Billochpura, Kali Masjid Chowkin Tara, 9-pillared house and street market place that displays traditional <i>zardozi</i> and stone in-lay works .	
Circuit 3 covering 1.5 kms includes Agra Fort, Jama Masjic and old city area adjacent to Agra Fort.	d

1.1c Urban Planning Impact

SI. No	Name of Project/Plan	9	Key Components Positive Impact							Nega	tive Im	pact	Remark		
		Time	Statu		EP	a D	Д	H	gn	EP	UP	ТP	HC	an	
Α	A TTZ REGION LEVEL														
A1															
A2	A2 MATHURA VRINDAVAN MC														
I	Mathura Slum Free City Action Plan	2018	NA	Housing and provision of houses for slum dwellers		٧									The report is informative and well-defined. But implementation status of project not know. It should be a beneficial project.

II	AMRUT SAAP	2016-17	NA	Provision of infrastructure at city level	,	V						The report is informative and well-defined. But implementation status of project not know. It should be a beneficial project.
III	AMRUT SLIP	2015		Water supply to Mathura Municipal Corporation which will benefit around 44829 Households.		V						
IV	HOUSING PROJECTS LIKE HI-TECH CITY	2017	NA	High rise housing project			2	S		٧		Housing is the need in Mathura and Vrindavan. But there are many high rise housing projects that are coming up in between Mathura-Vrindavan towards Kosi Kalan. This will hamper the aesthetics of the place.
V	Rehabilitation and beautification work between Raman Reti Tihare till Vrindavan parikrama in Janpath Mathura under HRIDAY	2017	Implemented			٧						Good Project
A3	Firozabad MC										•	
I	27 projects on underground drainage and road	2013	10 projects completed, rest ongoing		1	٧						Beneficial but very slow progress
II	AMRUT Projects	2017	NA	Provision of infrastructure at city level		V						The report is informative and well-defined. But implementation status of project not know. It should be a beneficial project.
A4	HATHRAS											
	AMRUT Projects	2017	NA	Provision of infrastructure at city level		٧						The report is informative and well-defined. But implementation status of project not know. It should be a beneficial project.

	Projects Under AMRUT	2018	NA	Sewage work (SAAP) of benefiting 16185 Households, with STP of capacity 5 MLD	٧				The report is informative and well-defined. But implementation status of project not know. It should be a beneficial project.
С	Bharatpur Municipal Corporation	NA	NA	Green Space & Park Works, Development & beautification of E.W.S. Quarters parks	٧				Implementation status of project not know. It should be a beneficial project.
	TUNDLA								
P	Augmentation of Mathura Tundla Pipeline (MTPL)	2017 (30 months project)	Partly completed (Agra-Tundla has been envisaged)	Augmentation of Mathura-Tundla oil pipeline has been envisaged.	٧	3		V	The project has been initiated would bring economy to the city and the region but the environmental concerns are very high. An EIA should be the first step followed by monitoring on the standards and regulations being maintained as per environmental rules and regulations of the country.
ir	mplementation of Fundla - I mega lift rrigation scheme on 1235.53 acres of land source:pppindia.gov)	2013-17	Under Construction	The project involves implementation of Tundla - I mega lift irrigation scheme under Cluster No. XIV in Kalahandi district. The scope of work includes lifting of water from intake well-constructed inside the river or reservoir mechanically by high capacity pump.				V	Exploitation of ground water resources.
	PMKVY Franchise In Fundla, Uttar Pradesh	2015	Unknown	Pardhan Mantri Kausal Vikas Yojna,	٧				Should be a beneficial project.

				skill and training						
				program						
Α7	FATEHPUR SIKRI									
1	Adopt a Heritage- 'Apni Dharohar, Apni Pehchaan'	2017	Unknown	Project for Development of Tourist Friendly Destinations	٧					Should be a beneficial project.
2	Swadesh Darshan Scheme (Source: TOI)	2017	Unknown	Under the central government's Swadesh Darshan scheme, the district administration is considering proposals to start a helicopter service between two world heritage sites, i.e. Agra and Fatehpur Sikri.		2	S		٧	Not beneficial
A8	GOVARDHAN & RADHAK	UND								
1	Mathura Vrindavan Master plan G (Govardhan and Radhakund)	2021	Partially complete	Proposed built up area of 75.84 Ha	٧					Should be a beneficial project.
		2021	Complete	Proposed Parikrama Marg	٧					Should be a beneficial project.
		2021	Incomplete	Proposed Commercial center	٧					Should be a beneficial project.
		2021	Unknown	Proposed Office area of 6.53 ha which accounts to 0.4% of land use.	٧					Should be a beneficial project.
		2021	Unknown	115.26 ha proposed land for Public Semi Public land use	٧					Should be a beneficial project.
		2021	Unknown	Proposed 195.68 ha land for transportation				٧		Transportation area should not affect the natural resources
		2021	Unknown	Proposed 169.02 ha land (10.47%) for Ashrams/Maths and Pilgrimage.	٧					Proper demarcation of areas with parking facilities

		2021	Unknown	Parks and Open Spaces: 380.98 Ha proposed land	٧					Should be a beneficial project.
		2021	Unknown	Other facilities like Tourist centers (9.6Ha), forest area (104.38 ha), Green belt of 4.5 m along bypass, Camp and parking area in festive season (88.96 ha)	٧					Should be a beneficial project.
2	Govardhan Pashupalan Yojna (Animal Husbandry scheme)	2018	Proposal	Helping local economy through animal husbandry	٧					Should be a beneficial project.
3	Gobar Dhan Yojna	2018	Proposal	Generating fuel from animal waste, Galvanizing bioorganic resources	٧	2				Should be a beneficial project.

S.N	Name of	a. 0	S	Key Components	Р	ositi	ve In	npac	ct	Ne	egati	ve In	npac	t	Remark
0	Project/Plan	Time	Status		EP	UP	TP	НС	UD	EP	UP	ТР	НС	UD	
B.	AGRA CITY LEVE	L:													
1	Rail based Mass Rapid Transit System in Agra-AGRA METRO	NA	NA	i. Sikandara to Taj East Gate- 14 kms ii. Agra Cantt. to Kalindi Vihar- 16 kms		٧									The projects will create congestion during the construction phase but looking at the long term impacts it will have greater positive impact than negative. Sikandra and Kalindi Vihar are industrial hubs and it will help daily commute for job for all sections of the society particularly the low income population. Also, mass transit

											will be environment friendly and a means to mitigate congestion. On the negative side, the path of the rail should be well thought out so as not to affect the view
2	Residential plot scheme 2017	NA	NA	Under this scheme, the authority is offering total 128 different categories residential plots		٧					shed of the heritage sites. The scheme will have more positive impact if the location of the residential plots are well thought out and offer a means to release congestion from the core. The plots should have schemes to cater to the low income group, since a majority of the population in Agra live in slums and it will be a good strategy to provide options for better quality housing and infrastructure.
3	Uttar Pradesh Pro-Poor Tourism Development Project	Dec 201 7 to Dec 202 2	Ongoing	UN funded project adopted by UP Tourism department	•	٧	?				This project will help the local economy in two ways, enhancement of tourism and alleviation of poverty by better providing better job opportunities to the low income group.
4	'Adopt a Heritage' scheme	NA	NA	NA C		٧					This project is an opportunity for responsible and sustainable tourism. A public private partnership will not only resolve funding issues but will also provide wider options for greater community participation and creative means of employment generation through tourism.
5	"Development of Solar Cities" programme by the Ministry of New and Renewable Energy (MNRE),	NA	NA	NA		٧					This project will definitely have a positive impact. Agra faces severe electricity shortage and this project will provide an environment friendly sustainable solution. Though the major hurdle would be in acquiring the funds and capacity building.
6	Riverfront development by tourism department	NA	NA	The stretch from Rambagh downstream to the proposed rubber check dam site at nagla pema, with area covering breath of 75m along one bank.		٧			٧		The project will have both positive and negative impacts. From the point of view of water retention, irrigation and enhancement of tourism and economy through river front recreational facilities, it might have immediate positive impacts. Also, rubber check dams

8	SCADA system	NA	NA	UP Jal Nigam has introduced SCADA system providing real time information regarding pressure and water flow and alerts on leakages.	٧					cause lesser erosion than conventional check dams but if long term positive and negative impacts are weighed particularly from the point of view of reviving a dead river, this is not the best solution. Dams will affect erosion and impact the ecosystem. It will further pollute the river downstream which has been the case for Agra due the the construction of 5 barrages upstream in Mathura, Delhi and Way up North. Dams slow down rivers and it loses its natural capacity to clean itself which is essential for a healthy flow. The river should be allowed to revive its natural flow and natural ecosystem through ravine development, afforestation, plantations along river and by checking any kind of constructions along its banks. If at all river front should be developed, it should have gardens, plantations and natural bio diversity. It is a smart city initiative. The impact will be positive if the system can be maintained and monitored efficiently in the long run. The challenge will be capacity building for using the
9	Roshan Agra Yojana,	NA	NA	Under Roshan Agra Yojana, 72,000 new connections have been provided for EWS and slum residents.	٧					full potential of a SCADA system. Should be beneficial project.
10	Water Supply Scheme for Agra City	201 6- 17 ti 201 9- 20	NA	AMRUT	٧					Should be beneficial project.
11	Sewerage Scheme for Agra City	201 6- 17	NA	AMRUT	٧					Should be beneficial project.
12	AMRUT Projects	201 7	NA	(i) Convergence to achieve objective of universal coverage of WS and WW services. (ii) INR 105 Crore will be dovetailed through AMRUT for implementing 24x7 smart WS for Taj Improvement District area. (iii) INR 153 crore will be dovetailed	٧					Should be beneficial project.

				through AMRUT to implement 100%						
13	Aasara	NA	NA	sewerage network and coverage. In-situ housing upgradation and construction of affordable housing will be taken up by the SPV along with DUDA under the Housing for All scheme.	٧					Should be beneficial project.
14	Swachh Bharat Mission (SBM), MoUD	NA	NA	(i) SBM's objective of 100% door-to-door collection and scientific disposal of waste will be achieved. (ii) Agra Smart City SPV along with Agra Nagar Nigam(ANN) will assist in designing and rollout of the project.	٧					Should be beneficial project.
15	Tajganj project by U.P Tourism	NA	NA	sewerage, pathways, cobble-stone streets, street lighting, street benches, police check post, landscaping, toilets and underground cabling. The project is being implemented at a total cost of INR 197.2 crore.	٧					Should be beneficial project.
16	International street cafe project by Agra Development Authority	NA	NA	International street cafe project is developed by ADA with estimated investment of INR 35 crore. The project includes development of 2 international restaurants, 1 pavilion ad 8 food stalls	٧			٧		The project is slotted for Fatehabad road, which is already an over populated and congested section. Majority of the hotels and restaurants are along this road. The location, the design, (whether pedestrian or will require parking), the ambience, will ultimately decide if the impact will be positive or negative. If the café invites more congestion, traffic and added requirement for parking facilities, it will have its share of negative impacts.
17	Solar City Mission	NA	NA	UPNEDA is assisting ANN in conducting energy audit and piloting the solar power project in the TID zone under the solar city mission, funded by MNRE.	٧					Should be beneficial project
18	Taj Orientation Center	NA	NA	UP Tourism constructing state-of-the-art 'Taj Orientation Centre' (INR 231.8 crores). It will house auditorium, open air theatre, waterbody, museum, crafts shops, permanent/temporary exhibition spaces and parking.	٧					Should be beneficial project
19	Mughal Museum by U.P Tourism	NA	NA	UP Tourism building 'Mughal Museum' (INR 141.9 crores) showcasing Mughal history, culture, cuisine, performing arts, handicrafts, literature, administrative, manuscripts, and weaponry.	√					Should be beneficial project

20	Development	NA	NA	ADA has been working at developing	١	/			Should be beneficial project
	of park and			Tajganj. Some of its recently completed,					
	painting of			ongoing and proposed initiatives include					
	buildings			development of a park at Trident Tiraha					
	funded by			(INR 2 crore) and painting all buildings in					
	Agra			vicinity of the Taj Mahal white, to achieve					
	Development			architectural harmony and reduce visual					
	Authority(ADA			clutter (INR 0.34 crore).					
)								

1.1d: Traffic and Transportation Appraisal

S.No.	Name of	Timeframe	Status	Key Components		Posi	tive In	npact		Neg	ative	Impa	ct		Remark /
	Project /Plan				EP	UP	TP	НС	UD	EP	UP	TP	НС	UD	Recommendations
1	Draft Comprehensive Mobility Plan (CMP), Agra.	2018 – 2041	Under Preparation	Overall assessment		2									The master plan considered has a horizon year of 2021. As the travel demand is a function of Land use and density. The projections and distribution of populations might change effect the travel demand if the Master plan which might be prepared for 2041 doesn't match with CMP. This may result in improper estimate of Travel demand and Transport Infrastructure.
				25)											It is recommended to prepare a Sustainable Integrated Landuse Transport Plan.
	Prepared by Urban Mass Transit Company Limited, 2017.			Sec 7.2.1: Identified 7 High Demand Mobility Corridors that could have MRTS along it. These have been proposed as 9 radials extending to the fringes of ADA.			✓								These mobility corridors must ensure that the pedestrian infrastructure is not compromised.
				Sec 7.2.1.1: Proposed augmenting of city bus/feeder bus fleet to achieve supply of 60 buses/lakh population.			✓								The fleet introduced must be electric or CNG, low floor buses.

S.No.	Name of	Timeframe	Status	Key Components		Posi	tive Ir	npact		Neg	ative	Impa	ct		Remark /
	Project /Plan				EP	UP	TP	НС	UD	EP	UP	TP	НС	UD	Recommendations
				Sec 7.2.1.2: Proposed 10 multimodal hubs at the intersection of each mobility corridors.			✓								These hubs must ensure adequate parking provisions for IPT and planned organized movement.
				Sec 7.2.2: Proposed augmentation of road capacities by developing 3 ring roads (Inner Ring as 4-lane divided and Outer Ring as 6-lane divided) and 7 radials networks as 4-lane divided roads.		2	~		,						This ring-radial network would help in deconcentration of core area.
				Sec 7.2.3: Proposed to have integrated and on-demand IPT service in the city. All the IPT vehicles must be registered and GPS enabled for online tracking.			✓								Since most of the e- rickshaws plying not only in Agra but other settlements of TTZ are un-registered, this is safety hazard for users as well as driver. So this must be ensured in all settlements of TTZ region.
				Sec 7.2.3: Proposed to have e-mobility and recommended provision of parking spaces and charging facilities at each of the bus MRTS stop/terminal.			✓								This must be ensured at the earliest and in the initial stages electric public transport fleet needs to be introduced.
				Sec 7.2.4: Proposed grade separated pedestrian crossing at 31 junctions. Recommended to construct footpath and cycle tracks along 182km of the road			✓								Must also ensure that these footpaths are used for parking or encroached. Also, the design standards of

S.No.	Name of	Timeframe	Status	Key Components		Posi	tive In	npact		Neg	ative	Impa	ct		Remark /
	Project /Plan				EP	UP	TP	нс	UD	EP	UP	TP	НС	UD	Recommendations
				network having RoW>18 mts. Proposed Bike Sharing System.											footpath should not be compromised.
				Sec 7.2.5: Proposed 3 freight terminals and phase-wise restriction of HCV in different parts of the city during 7am-1pm and 3-9pm.								✓			HCV should not be allowed within the cities. The internal goods movement should only be through non fossil fuel operated LCV and small pickup cargo vehicles at specific times of day and night.
				Sec 7.2.6: Proposed preparation of detailed parking policy and land use based parking master plan. Suggested 11 locations for off-street parking locations.			✓								Needs to be prepared at the earliest.
				Sec 7.2.7: Recommended Junction Improvement for 10 locations.			✓								Beneficial
				Sec 7.2.8: Recommended tourist passes to hop-on-hop-off in any mode of public transport and creation walkways for tourism management.			√								The hop-on-hop-off buses must be electric, should cover the unexplored tourist destinations, and rather than just the tourist passes common mobility card for locals also must be introduced.
2															

S.No.	Name of	Timeframe	Status	Key Components		Posi	tive In	npact		Neg	ative	Impa	ct		Remark /
	Project /Plan				EP	UP	TP	НС	UD	EP	UP	TP	НС	UD	Recommendations
	DPR for Rail Based Mass Transit System in Agra Prepared by RITES Limited, 2016			Sec 4.2: Proposed two MRTS corridors: Corridor 1 (15 stations) is from Sikandra to Taj East Gate and Corridor 2 (16 stations) from Agra Cantt to Kalindi Vihar.			✓		<						This project would be beneficial over long run.
				Sec 5.4-5.7: Recommended intermodal integration with feeder modes (mini-buses), and parking along metro corridors and public bike sharing near metro stations.		2	~		>						Beneficial
3	Final report on 20yrs Perspective Plan for Uttar Pradesh Prepared by A. F. Ferguson & Co., 2002			Sec 7.21: Recommended projects to augment tourism: a)Night viewing of Taj with adequate safeguards or through river based viewing (houseboats); b)Visitor centre/gallery to be located within Taj Premises; c) Developing Mughal Museum near Agra Fort; d) Landscaping along the entire river bank.			✓								This could increase the tourist stay in the settlement.
				Appendix-II: Recommended deluxe shuttle rail bus between Agra & Fatehpur Sikri. A seven-10 coach special tourist train linking the major sites in UP.			✓								Beneficial

S.No.	Name of	Timeframe	Status	Key Components		Posi	tive In	npact		Neg	ative	Impa	ct		Remark /
	Project /Plan				EP	UP	TP	НС	UD	EP	UP	TP	НС	UD	Recommendations
4	Uttar Pradesh Tourism Policy Perspective & Tourism Policy Client: Department of Tourism Govt of U.P.			Sec 5.2.2: Recommended that all major tourist destinations shall be connected through 4 lane divided highways and at places be upgraded to 6 lane divided highways and separate head be created in the PWD budget for creating roads connecting to tourist destinations.		2						~			Connectivity to major tourist destinations is not just about constructing highways. The connectivity to any settlement must be in accordance with the character of the city. For eg, settlements like Govardhan which were earlier visited by pilgrims on foot, is not being travelled by pilgrims in car due to construction of roads. So, the character of the city and also the impact of vehicular movement on the pollution level must be considered before developing highways.
				Sec 5.2.3: Recommended to provide Tourists Coaches/Luxury Buses/ Hop-on and Hop-off bus by creating tourism packages to major tourism destinations.			✓								Electric buses covering unexplored tourist destinations must be introduced.
				Sec 5.3: Identified Tourist Circuits- a) Braj Circuit (Mathura, Vrindavan, Agra and other places connected to Lord Shri Krishna's life) b) Heritage			✓								Beneficial

S.No.	Name of	Timeframe	Status	Key Components	Positive Impact EP UP TP HC UD		Neg	ative	Impa	ct		Remark /			
	Project /Plan					UP	TP	НС	UD	EP	UP	TP	НС	UD	Recommendations
				Arc (Agra-Lucknow-Varanasi) region											
				Sec 5.2.3: Recommended extending shatabdi connectivity to Varanasi on the Heritage Arc.			✓								Beneficial
5	Comprehensive Environmental Management Plan (CEMP) for Taj Trapezium Zone (TTZ) area Prepared by by NEERI, 2013		Actions already taken	Sec 2.4.2: Dieselisation of Railway Yards; Supply of ultralow sulfur diesel; Restriction on polluting vehicles around 500 m of Taj Mahal and instead ply battery operated buses around it; Age fixation for public & commercial vehicles and no new registration of barred vehicles; supply of CNG.	>	2	✓								
				Sec 2.4.4: Recommended that all vehicle should be under ambit of fitness testing. Further legal provision should be made at petrol pumps to provide fuel only to those vehicles, which have fitness certificate.			✓								
				Sec 2.4.4: Prepare Comprehensive Mobility Plans for different settlements in TTZ.			✓								This must be done at the earliest for all settlements having population ranging between 1-5 lakhs.
6	Comprehensive Mobility Plan (CMP), Agra			Presentation: Recommended complete ring radial network (11 radials and 3 orbitals). Proposed			✓								Beneficial

S.No.	Name of	Timeframe	Status	Key Components	Positive Impact		Neg	ative	Impa	ct		Remark / Recommendations			
	Project /Plan				EP	UP	TP	НС	UD	EP	UP	TP	НС	UD	Recommendations
	Prepared by Urban Mass Transit Company Limited, 2007			4 bus terminals, 4 sub-terminals and 2 regional workshops. Recommended bicycle network of 200km and pedestrian network of 300 km. Introduce Hop-on-Hop-off services; public bike sharing.											
7	Need Assessment for Urban Transport, Water, Drainage, sewerage, SBM, Housing & Power Agra City			Sec 3.7.2: Recommended short-term traffic measures such as one-way roads (MG road); restricting all goods traffic during peak hours and establishing Traffic Engineering Cell.		2	\								Beneficial
	Prepared by Ramky Enviro Engineers Limited, 2008			Sec 3.7.3 - 3.7.8: Recommended medium term measures such as formal public transport (BRTS along eastwest and north-south corridors of Agra.								✓			Introducing BRTS may face challenges as the roads in the city are narrow, thus the coverage may not be good. Further, rather than developing BRTS, mini-buses can be introduced with good coverage.
			<	Sec 3.7.9 - 3.7.13: Recommended long term measures such as shifting of wholesale market; developing two bus terminals and developing outer bypass road.			✓								Beneficial
8	Environmental post evaluation of the projects under the		Completed	Sec 4.2: Indicated emission reductions and congestion due to widening of Agra bypass.											
	schemes in TTZ			Sec 5.2: Recommended paved shoulders; restrain trucks from			✓								Beneficial

S.No.	Name of	Timeframe	Status	Key Components	Positive Impact			Neg	ative	Impa	ct		Remark /		
	Project /Plan				EP	UP	TP	НС	UD	EP	UP	TP	НС	UD	Recommendations
	Prepared by NEERI, May 2010			overloading; stabilized road slopes; emergency response system.											
9	City Development Plan (CDP)			Sec 15.3: Recommended sky bus from Sikandara to Taj; Multi storied/ underground parking at 5 locations.								✓			Not beneficial
	Prepared by MDP Consultants and Allianz Securities, 2006			Sec 15.3: Recommended upgrading of existing terminals and developing 6 new ones. Further introduce CNG buses.			✓								Beneficial
10	Short & Long Term Action Plan for TTZ			Short Term Action Plan (6,7): Recommended ban of vehicles older than 15 years, strict pollution checking, providing adequate supply of CNG in TTZ region.	5	-	✓								Beneficial
				Other Short Term Measures: Toll Plaza to be relocated outside TTZ to avoid pollution due to congestion; encouraging CNG and e-vehicles introduce odd-even and provide adequate parking provisions.			✓								Beneficial
				Long Term Action Plan (5,6,7,9,11,18): Recommended increase in number of pollution checking centres; Construction of Phase-III of inner ring road; mechanized sweeping along roads, developing roads of international standards; introducing metro and provide permit only for CNG/ electric hybrid vehicles at city, state and national levels.			✓								Beneficial
												✓			Multi-level car parking near Taj would not be

S.No.		Timeframe	Status	Key Components	Positive Impact			Negative Impact					Remark /		
	Project /Plan				EP	UP	TP	НС	UD	EP	UP	TP	НС	UD	Recommendations
				Long Term Action Plan (10):Multilevel car parking near Taj East Gate					<						beneficial. Rather the visitors must be provided parking at outer cordon points and park and ride services be provided to visitors from that point.

Annexure of Chapter 2

Annexure 2.1: Ambient Air Quality & Water Quality Data of TTZ

SAMPL	ING POINT			U/S M	ATHURA		
PARAN	1ETER	PH	DO	B.O.D	C.O.D	T.D.S	CL
YEAR	MONTH	РП	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
	JAN	7.28	2.8	12.4	64	748	116
	FEB	7.12	3.4	8.6	32	716	124
	MAR	7.46	4	8.8	40	706	130
	APR	7.24	3.7	9.8	48	784	148
	MAY	7.12	3.6	7.8	32	739	138
2013	JUN	7.32	5.6	7.2	40	702	124
2013	JUL	7.34	6.2	6.4	32	604	80
	AUG	7.31	6.8	7.2	24	650	72
	SEP	7.96	6.4	7.8	40	708	86
	ОСТ	7.43	6.8	6.4	32	626	72
	NOV	7.38	3.8	8.4	40	-	72
	DEC	7.32	5	7	36	720	76
	JAN	7.87	1.8	8	56	700	74
	FEB	7.55	2	14.2	80	843	112
	MAR	7.72	3.2	8.4	64	848	106
	APR	7.56	4.5	7.4	36	730	98
	MAY	7.48	4	8.2	44	702	94
2014	JUN	7.58	4.2	7.4	48	694	96
2014	JUL	7.05	4.2	10.2	72	690	114
	AUG	7.28	4	8.2	64	670	94
	SEP	7.63	6.8	7.2	48	754	110
	ОСТ	7.87	5.6	7.6	56	762	106
	NOV	7.67	5.4	8.6	60	712	84
	DEC	7.43	3.7	9.8	80	706	92
	JAN	7.25	4	10.6	80	734	98
	FEB	7.56	3.8	9.4	64	722	90
	MAR	7.52	4.2	10.8	72	698	102
	APR	7.56	4.5	10.6	72	720	102
	MAY	7.63	5.2	9.4	48	674	96
2015	JUN	7.32	4.6	9.8	64	652	88
2013	JUL	7.45	4.8	8.6	72	672	98
	AUG	7.67	5.6	8.2	64	630	88
	SEP	7.48	5.8	8.8	56	662	68
	ОСТ	7.72	4.8	7.6	64	684	82
	NOV	7.62	4.9	7.8	64	650	78
	DEC	7.81	4.3	8.4	72	636	80
	JAN	7.82	3.6	8.8	64	690	112
2016	FEB	6.4	3.1	10.2	72	734	118
2010	MAR	7.84	4.7	8.4	56	704	118
	APR	7.56	5.2	7.6	52	714	112

	MAY	7.46	5.2	7.2	52	676	118
	JUN	7.86	5.4	7.2	48	656	114
	JUL	7.61	4.6	8.2	56	690	178
	AUG	7.67	4.9	7.2	48	676	156
	SEP	7.52	5.5	8.2	56	728	174
	ОСТ	7.36	4.8	9.6	72	680	162
	NOV	7.56	5.4	8.6	64	695	162
	DEC	8.12	4	9.4	72	702	176
	JAN	7.68	4.7	8.6	56	742	188
	FEB	7.62	4.9	7.6	48	664	154
	MAR	7.61	2.8	10.4	64	662	176
	APR	7.96	5.5	7.6	56	648	166
	MAY	7.98	5.3	8.4	56	724	172
2017	JUN	7.82	4.9	7.2	48	624	164
2017	JUL	7.8	5.3	6.8	44	712	166
	AUG	7.52	7.8	8	54	796	182
	SEP	7.61	5.7	13	64	666	126
	ОСТ	7.23	4.4	12	84	782	186
	NOV	7.6	3.9	14	60	798	-
	DEC	7.5	3.8	13	76	804	-
SAMPL	ING POINT			VISHR	AM GHAT	T	_
PARAM	IETER	PH	DO	B.O.D	C.O.D	T.D.S	CL
YEAR	MONTH		(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
YEAR	MONTH JAN	7.24	2.6	(mg/l) 12.8	(mg/l) 80	(mg/l) 760	(mg/l) 128
YEAR				12.8			
YEAR	JAN	7.24	2.6 3 3.6	12.8 9 9	80 40 56	760	128 130 138
YEAR	JAN FEB	7.24 6.84 7.24 7.16	2.6 3 3.6 3.4	12.8 9 9 10.6	80 40 56 64	760 720 718 812	128 130 138 154
YEAR	JAN FEB MAR	7.24 6.84 7.24	2.6 3 3.6	12.8 9 9	80 40 56	760 720 718	128 130 138
	JAN FEB MAR APR MAY JUN	7.24 6.84 7.24 7.16 6.96 7.18	2.6 3 3.6 3.4 3.2 5.2	12.8 9 9 10.6 8.6 7.4	80 40 56 64 48 56	760 720 718 812 744 716	128 130 138 154 144 130
YEAR 2013	JAN FEB MAR APR MAY JUN JUL	7.24 6.84 7.24 7.16 6.96 7.18 7.56	2.6 3 3.6 3.4 3.2 5.2 5.8	12.8 9 9 10.6 8.6 7.4 6.8	80 40 56 64 48 56 40	760 720 718 812 744 716 618	128 130 138 154 144 130 74
	JAN FEB MAR APR MAY JUN JUL AUG	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4	12.8 9 9 10.6 8.6 7.4 6.8 7.6	80 40 56 64 48 56 40 28	760 720 718 812 744 716 618 646	128 130 138 154 144 130 74 74
	JAN FEB MAR APR MAY JUN JUL AUG SEP	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8	80 40 56 64 48 56 40 28 48	760 720 718 812 744 716 618 646 714	128 130 138 154 144 130 74 74 94
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84 7.27	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2 6.4	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8 7.2	80 40 56 64 48 56 40 28 48 36	760 720 718 812 744 716 618 646 714 648	128 130 138 154 144 130 74 74 94 78
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84 7.27 7.36	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2 6.4 3.6	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8 7.2 9	80 40 56 64 48 56 40 28 48 36 56	760 720 718 812 744 716 618 646 714 648 702	128 130 138 154 144 130 74 74 94 78 76
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84 7.27 7.36 7.35	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2 6.4 3.6 4.8	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8 7.2 9 7.4	80 40 56 64 48 56 40 28 48 36 56 48	760 720 718 812 744 716 618 646 714 648 702 728	128 130 138 154 144 130 74 74 94 78 76 80
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84 7.27 7.36 7.35 7.89	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2 6.4 3.6 4.8 1.5	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8 7.2 9 7.4 8.6	80 40 56 64 48 56 40 28 48 36 56 48 72	760 720 718 812 744 716 618 646 714 648 702 728 698	128 130 138 154 144 130 74 74 94 78 76 80 88
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84 7.27 7.36 7.35 7.89 7.62	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2 6.4 3.6 4.8 1.5 1.8	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8 7.2 9 7.4 8.6 14.4	80 40 56 64 48 56 40 28 48 36 56 48 72 96	760 720 718 812 744 716 618 646 714 648 702 728 698 848	128 130 138 154 144 130 74 74 94 78 76 80 88 120
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84 7.27 7.36 7.35 7.89 7.62 7.86	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2 6.4 3.6 4.8 1.5 1.8 2.8	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8 7.2 9 7.4 8.6 14.4 9.2	80 40 56 64 48 56 40 28 48 36 56 48 72 96 68	760 720 718 812 744 716 618 646 714 648 702 728 698 848 852	128 130 138 154 144 130 74 74 94 78 76 80 88 120 114
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84 7.27 7.36 7.35 7.89 7.62 7.86 7.48	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2 6.4 3.6 4.8 1.5 1.8 2.8 4.2	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8 7.2 9 7.4 8.6 14.4 9.2 7.8	80 40 56 64 48 56 40 28 48 36 56 48 72 96 68 48	760 720 718 812 744 716 618 646 714 648 702 728 698 848 852 728	128 130 138 154 144 130 74 74 94 78 76 80 88 120 114 104
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84 7.27 7.36 7.35 7.89 7.62 7.86 7.48 7.52	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2 6.4 3.6 4.8 1.5 1.8 2.8 4.2 3.8	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8 7.2 9 7.4 8.6 14.4 9.2 7.8 8.6	80 40 56 64 48 56 40 28 48 36 56 48 72 96 68 48 52	760 720 718 812 744 716 618 646 714 648 702 728 698 848 852 728 716	128 130 138 154 144 130 74 74 94 78 76 80 88 120 114 104 98
2013	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84 7.27 7.36 7.35 7.89 7.62 7.48 7.52 7.62	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2 6.4 3.6 4.8 1.5 1.8 2.8 4.2 3.8 4	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8 7.2 9 7.4 8.6 14.4 9.2 7.8 8.6 7.8	80 40 56 64 48 56 40 28 48 36 56 48 72 96 68 48 52 52	760 720 718 812 744 716 618 646 714 648 702 728 698 848 852 728 716 678	128 130 138 154 144 130 74 74 74 94 78 76 80 88 120 114 104 98 104
2013	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84 7.27 7.36 7.35 7.89 7.62 7.86 7.48 7.52 7.62 7.26	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2 6.4 3.6 4.8 1.5 1.8 2.8 4.2 3.8 4	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8 7.2 9 7.4 8.6 14.4 9.2 7.8 8.6 7.8	80 40 56 64 48 56 40 28 48 36 56 48 72 96 68 48 52 52 80	760 720 718 812 744 716 618 646 714 648 702 728 698 848 852 728 716 678 690	128 130 138 154 144 130 74 74 94 78 76 80 88 120 114 104 98 104 120
2013	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84 7.27 7.36 7.35 7.89 7.62 7.48 7.52 7.62 7.62 7.16	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2 6.4 3.6 4.8 1.5 1.8 2.8 4.2 3.8 4 3.8 3.8	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8 7.2 9 7.4 8.6 14.4 9.2 7.8 8.6 7.8 10.6 8.6	80 40 56 64 48 56 40 28 48 36 56 48 72 96 68 48 52 52 80 72	760 720 718 812 744 716 618 646 714 648 702 728 698 848 852 728 716 678 690 672	128 130 138 154 144 130 74 74 74 94 78 76 80 88 120 114 104 98 104 120 104
2013	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL	7.24 6.84 7.24 7.16 6.96 7.18 7.56 7.28 7.84 7.27 7.36 7.35 7.89 7.62 7.86 7.48 7.52 7.62 7.26	2.6 3 3.6 3.4 3.2 5.2 5.8 6.4 6.2 6.4 3.6 4.8 1.5 1.8 2.8 4.2 3.8 4	12.8 9 9 10.6 8.6 7.4 6.8 7.6 8 7.2 9 7.4 8.6 14.4 9.2 7.8 8.6 7.8	80 40 56 64 48 56 40 28 48 36 56 48 72 96 68 48 52 52 80	760 720 718 812 744 716 618 646 714 648 702 728 698 848 852 728 716 678 690	128 130 138 154 144 130 74 74 94 78 76 80 88 120 114 104 98 104 120

	NOV	7.64	5.2	9	68	716	90
	DEC	7.31	3.4	10.2	80	710	96
	JAN	7.32	3.8	11.2	96	728	106
	FEB	7.48	3.4	9.6	72	718	88
	MAR	7.66	4	11.2	80	692	106
	APR	7.64	4.4	11.2	88	720	112
	MAY	7.58	5	9.8	64	686	104
2015	JUN	7.46	4.2	10.8	80	678	82
2015	JUL	7.55	4.6	9.2	80	682	104
	AUG	7.56	5.4	8.4	72	630	94
	SEP	7.56	5.6	9.2	64	670	76
	ОСТ	7.65	4.6	7.8	64	686	94
	NOV	7.77	4.7	8.4	72	654	88
	DEC	7.78	4	8.6	80	638	84
	JAN	7.7	3.3	9.2	80	688	116
	FEB	7.73	2.8	10.4	88	702	124
	MAR	7.79	4.4	9.2	72	700	124
	APR	7.48	5	7.8	64	712	118
	MAY	7.48	4.8	9.4	72	678	132
2016	JUN	7.91	5.2	7.6	64	662	128
2016	JUL	7.48	4.3	9.4	72	698	192
	AUG	7.51	4.5	7.6	64	682	162
	SEP	7.49	5.2	8.6	72	720	178
	ОСТ	7.48	4.6	9.8	88	684	166
	NOV	7.98	5	7.2	48	694	144
	DEC	8.07	3.7	9.8	80	699	174
	JAN	7.75	4.5	8.8	68	758	194
	FEB	7.52	4.7	8.2	64	672	168
	MAR	7.57	2.4	11.2	80	670	174
	APR	7.77	5.2	8	64	656	170
	MAY	7.82	5.1	8.8	56	638	176
2017	JUN	7.77	4.6	7.6	52	634	162
2017	JUL	7.72	4.9	7.4	56	634	166
	AUG	7.52	4	7.5	50	686	170
	SEP	7.58	5.4	6.2	58	764	166
	ОСТ	7.46	4.2	7.5	56	720	168
	NOV	7.32	4.8	8	64	762	-
	DEC	7.6	3.7	10	48	798	-
SAMPL	ING POINT	1		D/S M	IATHURA	1	1
PARAN	1ETER	PH	DO	B.O.D	C.O.D	T.D.S	CL
YEAR	MONTH		(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
	JAN	7.2	2.4	12.6	72	754	126
2013	FEB	6.52	2.8	9.4	48	718	128
_010	MAR	7.18	3.2	9.6	48	716	142
	APR	6.98	3.1	10.8	72	798	152

	MAY	6.82	3.1	8.8	40	742	142
	JUN	7.03	4.8	7.8	48	-	128
	JUL	7.76	5.6	7.2	36	624	76
	AUG	7.18	6.2	7.4	32	636	70
	SEP	7.81	5.8	8.6	56	720	90
	ОСТ	7.23	6	6.8	36	644	80
	NOV	7.36	3.2	8.6	48	-	84
	DEC	7.11	4.2	7.6	48	726	78.3
	JAN	7.91	1.2	8.8	72	700	86
	FEB	7.84	1.6	14.8	96	848	118
	MAR	7.92	2.6	9.8	72	850	110
	APR	7.44	4.2	8	48	722	106
	MAY	7.56	3.6	8.8	56	724	102
2014	JUN	7.71	3.8	8.2	56	686	108
2014	JUL	7.35	3.5	10.8	80	696	118
	AUG	6.96	3.6	8.8	72	674	110
	SEP	7.68	6.2	7.8	56	734	118
	ОСТ	7.79	5.2	8.4	72	758	108
	NOV	7.58	5	9.2	64	716	94
	DEC	7.54	3.3	10.6	96	696	98
	JAN	7.17	3.6	11.8	96	740	112
	FEB	7.42	3	10.2	72	724	92
	MAR	7.71	3.8	11.4	88	710	110
	APR	7.74	4.1	11.4	96	728	110
	MAY	7.67	5	10.2	72	690	108
2015	JUN	7.55	4	11.2	88	688	98
2015	JUL	7.68	4.2	9.8	80	672	106
	AUG	7.48	5	8.8	80	650	96
	SEP	7.59	5.4	9.4	72	668	78
	ОСТ	7.88	4.4	8.2	72	678	96
	NOV	7.51	4.5	8.6	72	652	90
	DEC	7.84	3.7	9	80	638	86
	JAN	7.65	3	9.6	88	676	114
	FEB	6.33	2.5	10.8	80	712	120
	MAR	7.72	4.1	9.4	64	722	132
	APR	7.63	4.8	9.2	72	724	120
	MAY	7.52	4.6	8.2	64	682	136
2016	JUN	7.96	5.2	7.8	56	656	132
	JUL	7.52	4.2	9.6	72	687	190
	AUG	7.43	4.3	7.8	56	672	174
	SEP	7.45	4.8	9.2	72	722	182
	ОСТ	7.53	4.4	10.2	80	676	168
	NOV	8.1	4.7	7.6	56	694	162
	DEC	7.97	3.5	9.6	80	706	178
2017	JAN	7.71	4.4	9.2	76	756	196

	FEB	7.89	4.3	8.6	64	670	170
	MAR	7.51	2.2	10.8	72	668	178
	APR	7.69	4.9	8.2	64	662	168
	MAY	7.87	4.7	9.2	64	612	180
	JUN	7.56	4.3	7.8	56	636	168
	JUL	7.69	4.6	7.6	60	722	174
	AUG	7.89	4.2	10	54	712	162
	SEP	7.69	5.2	14	64	624	118
	ОСТ	7.56	4	12.4	88	790	188
	NOV	7.6	3.9	14	60	798	-
	DEC	7.6	3.7	14	80	812	-
SAMPL	ING POINT			GOKUL	BARRAGE		
PARAN	METER	PH	DO	B.O.D	C.O.D	T.D.S	CL
YEAR	MONTH	FII	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
	JAN	7.12	2	9.4	56	714	124
	FEB	6.8	5.1	6.4	32	694	130
	MAR	7.51	4.1	7.2	40	702	124
	APR	7.65	3.9	8.4	56	674	136
	MAY	7.58	4.7	NA	72	895	176
2013	JUN	7.46	5.8	6	32	694	-
2013	JUL	6.8	6.6	5.4	40	656	82
	AUG	7.41	4.4	7.8	28	672	78
	SEP	7.34	6.8	7	32	704	84
	ОСТ	7.61	7.2	6	48	664	82
	NOV						
	DEC	7.1	3.6	7.2	56	732	76
	JAN	7.12	1	8.6	64	876	82
	FEB	7.68	3.4	9.8	72	852	130
	MAR						
	APR	8.05	3.5	8.6	60	754	110
	MAY	7.56	4.8	7.4	56	-	106
2014	JUN	7.68	4.7	8.4	64	-	112
	JUL	7.61	4.6	9.4	64	936	106
	AUG	7.56	4.8	8.2	48	860	98
	SEP	7.48	6	6.8	56	805	124
	ОСТ	7.68	4.8	9.2	64	782	114
	NOV	7.56	5.8	8.4	56	766	88
	DEC	7.98	3.8	10.6	72	784	92
	JAN	7.56	3.6	11.4	88	809	108
	FEB	7.68	4	10.8	72	768	104
_	MAR	7.68	4	12.2	96	788	124
2015	APR	7.43	5.3	9.6	80	762	108
	MAY	7.79	4.8	11.4	96	610	124
	JUN	7.58	4.8	12.6	96	724	102
	JUL	7.83	5.2	10.2	72	722	112

	AUG	7.63	5.2	9.4	64	684	96
	SEP	7.68	6.2	10.4	80	676	92
	ОСТ	7.98	3.8	8.8	64	-	-
	NOV						
	DEC	7.53	5	7.2	64	662	98
	JAN	7.46	4.7	9.4	72	699	118
	FEB						
	MAR						
	APR						
	MAY						
2016	JUN						
2010	JUL	8.12	4.8	7.4	48	694	182
	AUG	7.84	4.8	8.2	72	704	178
	SEP	7.81	4	9.6	80	728	169
	ОСТ	7.82	4.7	8.2	64	714	156
	NOV	7.56	5.2	7.6	48	694	166
	DEC	7.58	3.8	9.8	72	707	174
	JAN						
	FEB						
	MAR	7.48	3.1	9.6	-80	712	186
	APR	7.38	4.8	8.4	72	726	162
	MAY						
2017	JUN	7.72	4.1	7.8	60	694	174
2017	JUL						
	AUG	7.6	7.2	5.4	40	704	144
	SEP	7.73	5.1	8.2	80	776	169
	ОСТ	7.48	4.8	6	56	786	168
	NOV						
	DEC						
SAMPL	ING POINT			U/S VRINDA	AVAN MATHUR	A	ı
PARAN	_	PH	DO	B.O.D	C.O.D	T.D.S	CL
YEAR	MONTH		(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
	JAN	7.34	3.2	10.6	48	702	118
	FEB	7.48	3.6	7.4	24	680	112
		7.64	4.2	8	32	694	136
	FEB MAR APR	7.64 7.46	4.2 3.8	8 9.4	32 48	694 796	136 142
	FEB MAR APR MAY	7.64 7.46 7.26	4.2 3.8 4.2	8 9.4 7.4	32 48 24	694	136 142 132
2013	FEB MAR APR	7.64 7.46	4.2 3.8	8 9.4	32 48	694 796	136 142

AUG

SEP

OCT

NOV

DEC

JAN

2014

7.36

7.74

7.8

7.43

7.24

7.38

6.8

6.8

7

4.2

5.8

2.2

6

7.2

5.8

7.2

6.4

7.6

20

32

24

40

32

48

64

92

60

77

64

76

648

694

618

-

708

692

	FEB	7.42	2.4	12.2	64	840	110
	MAR	7.84	3.4	8.2	48	810	104
	APR	8.05	3.4	6.8	32	714	88
	MAY	7.38	4.5	7.8	40	688	92
	JUN	7.42	3.9	6.6	36	690	98
	JUL	7.86	3.8	9.2	56	696	108
	AUG	7.58	5	7.4	48	668	92
	SEP	7.68	6.7	6.4	40	738	108
	ОСТ	7.96	5.5	7.4	56	761	96
	NOV	7.47	5.7	6.6	48	730	82
	DEC	7.68	5.4	8.8	64	714	90
	JAN	7.22	4.6	9.8	56	730	96
	FEB	7.51	4.1	8.2	48	710	82
	MAR	7.56	4.8	9.2	56	696	94
	APR	7.58	4.7	10.4	80	706	106
	MAY	7.72	5.2	8.2	56	652	94
2015	JUN	7.56	4.4	9.2	72	674	86
2013	JUL	7.61	5.4	8.2	48	678	92
	AUG	7.72	5.9	7.6	56	646	86
	SEP	7.36	6.4	8.4	48	664	66
	ОСТ	7.62	5.4	6.8	56	686	84
	NOV	7.82	5.6	7.2	48	656	76
	DEC	7.68	5.2	6.8	56	630	78
	JAN	7.56	5	7.6	56	664	106
	FEB	7.34	4	7.8	48	712	108
	MAR	7.48	4.8	8.6	48	726	114
	APR	7.48	4.2	9	64	698	106
	MAY	6.46	4.8	7.4	48	658	128
2016	JUN	7.64	5.6	6.6	44	664	116
2010	JUL	7.64	5.2	8.4	48	678	184
	AUG	7.81	5.5	6.8	40	660	164
	SEP	7.69	5.8	7.6	48	718	158
	ОСТ	7.48	5.2	8.4	64	678	150
	NOV	7.46	5.8	7.8	56	695	152
	DEC	7.81	4.5	8.2	56	703	164
	JAN	7.81	5.4	6.8	52	726	182
	FEB	7.65	3.4	9.6	60	664	170
	MAR	7.61	3.2	9.4	64	648	164
	APR	7.58	5.8	7.2	48	632	148
2017	MAY	7.75	5.7	7.4	52	694	168
	JUN	7.48	5.2	6.4	40	647	148
	JUL	7.49	5.7	6.2	44	688	154
	AUG	7.62	7.5	12	48	869	171
	SEP	7.59	6.1	10	40	812	112
	ОСТ	7.33	4.5	11.4	84	772	178

	NOV	7.42	4.5	8	68	776	-
	DEC	7.36	4.1	10	68	792	-
SAMPL	ING POINT			D/S VRINDAV	VAN MATHURA	1	
PARAN	1ETER	PH	DO	B.O.D	C.O.D	T.D.S	CL
YEAR	MONTH	РП	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
	JAN	7.7	6	8.8	32	-	134
	FEB	7.16	3.2	7.8	40	686	120
	MAR	7.42	3.8	8.4	48	698	140
	APR	7.25	3.5	9.6	56	802	150
	MAY	7.18	3.5	8	32	740	136
2013	JUN	7.36	5.8	7	32	708	126
2013	JUL	6.65	5	6.2	32	610	72
	AUG	7.28	6.4	6.4	24	640	68
	SEP	7.8	6.6	7.6	40	716	96
	ОСТ	7.15	6.8	6	28	634	66
	NOV	7.38	4	7.8	48	684	80
	DEC	7.16	5.4	6.8	36	710	68
	JAN	7.42	2	8.2	64	690	80
	FEB	7.38	2.2	12.6	72	844	116
	MAR	7.76	3	8.6	56	824	112
	APR	7.94	3.2	7.2	36	714	94
	MAY	7.42	4.2	8.4	48	696	96
2014	JUN	7.48	4.1	7.2	44	692	102
2014	JUL	7.92	3.4	9.6	64	692	112
	AUG	7.5	4.6	7.6	56	672	96
	SEP	7.54	6.5	6.8	44	736	114
	ОСТ	8.01	5.3	7.8	70	762	102
	NOV	7.59	5.3	7.2	52	728	86
	DEC	7.92	5	9.2	72	706	94
	JAN	7.18	4.2	10.4	64	738	102
	FEB	7.45	3.8	8.6	56	714	86
	MAR	7.48	4.4	9.6	64	698	98
	APR	7.62	4.5	10.8	88	716	108.3
	MAY	7.69	4.9	8.6	64	650	98
2015	JUN	7.48	4	9.6	80	668	94
2013	JUL	7.64	5.2	8.4	56	678	94
	AUG	7.69	5.7	7.8	64	648	90
	SEP	7.55	6.2	8.6	56	664	74
	ОСТ	7.58	4.9	7.4	64	688	86
	NOV	7.76	5.2	7.6	56	652	80
	DEC	7.7	5	7.4	64	640	82
	JAN	7.48	4.8	8.2	72	670	110
2016	FEB	7.38	3.4	9	56	714	116
2010	MAR	7.55	4.5	8.8	64	724	126
	APR	7.82	3.8	9.6	72	706	110

ı	I	İ	1 1	ı	ı		1 1	
	MAY	6.82	4.2	7.8	56	654	136	
	JUN	7.52	5.4	6.8	52	674	124	
	JUL	7.58	4.7	8.6	64	690	186	
	AUG	7.75	5.2	7.4	56	654	168	
	SEP	7.57	5.3	7.8	64	718	170	
	ОСТ	7.66	5	8.8	72	694	156	
	NOV	7.82	5.2	8.4	72	703	160	
	DEC	7.86	4.3	8.8	64	702	170	
	JAN	7.72	5.1	7.2	60	738	184	
	FEB	7.61	2.6	10.2	76	676	176	
	MAR	7.58	2.8	10.6	72	652	172	
	APR	7.62	5.4	7.8	56	636	152	
	MAY	7.71	5.4	8.6	60	704	174	
2017	JUN	7.62	5	6.8	44	647	152	
2017	JUL	7.57	5.4	6.6	48	722	156	
	AUG	7.67	6.4	6	58	732	166	
	SEP	7.61	5.9	6.4	48	736	154	
	ОСТ	7.29	4.4	8.2	64	7820	174	
	NOV	7.32	4.8	8	64	762	-	
	DEC	7.48	4	12	72	788	-	
SAMPL	ING POINT	U/S REFINERY, MTR						
PARAM	1ETER	D	DO	B.O.D	C.O.D	T.D.S	CL	
		I PH						
YEAR	MONTH	PH	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	
YEAR	MONTH JAN	7.4	4.2	9.2	(mg/l) 40	(mg/l) 802	(mg/l) 108	
YEAR				9.2				
YEAR	JAN	7.4	4.2	9.2	40	802	108	
YEAR	JAN FEB	7.4 7.64	4.2 3.8	9.2	40 24	802 756	108 126	
YEAR	JAN FEB MAR	7.4 7.64 7.46	4.2 3.8 4.4	9.2 8 7.8	40 24 48	802 756	108 126 124	
	JAN FEB MAR APR	7.4 7.64 7.46 7.21	4.2 3.8 4.4 5.2	9.2 8 7.8	40 24 48 24	802 756 - -	108 126 124 136	
YEAR 2013	JAN FEB MAR APR MAY	7.4 7.64 7.46 7.21 7.36	4.2 3.8 4.4 5.2 5.6	9.2 8 7.8 - 6.2 6.2 5.8	40 24 48 24 16	802 756 - -	108 126 124 136 130	
	JAN FEB MAR APR MAY JUN	7.4 7.64 7.46 7.21 7.36 7.24	4.2 3.8 4.4 5.2 5.6 5.2	9.2 8 7.8 - 6.2 6.2	40 24 48 24 16 28	802 756 - - - -	108 126 124 136 130 112	
	JAN FEB MAR APR MAY JUN JUL	7.4 7.64 7.46 7.21 7.36 7.24 7.23	4.2 3.8 4.4 5.2 5.6 5.2 6.2	9.2 8 7.8 - 6.2 6.2 5.8	40 24 48 24 16 28 32	802 756 - - - - - 580	108 126 124 136 130 112 88	
	JAN FEB MAR APR MAY JUN JUL AUG	7.4 7.64 7.46 7.21 7.36 7.24 7.23 7.67	4.2 3.8 4.4 5.2 5.6 5.2 6.2 6.2	9.2 8 7.8 - 6.2 6.2 5.8 5	40 24 48 24 16 28 32 28	802 756 - - - - - 580 634	108 126 124 136 130 112 88 80	
	JAN FEB MAR APR MAY JUN JUL AUG SEP	7.4 7.64 7.46 7.21 7.36 7.24 7.23 7.67 7.36	4.2 3.8 4.4 5.2 5.6 5.2 6.2 6.2 5.6	9.2 8 7.8 - 6.2 6.2 5.8 5	40 24 48 24 16 28 32 28 32	802 756 - - - - 580 634	108 126 124 136 130 112 88 80 62	
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT	7.4 7.64 7.46 7.21 7.36 7.24 7.23 7.67 7.36 7.51	4.2 3.8 4.4 5.2 5.6 5.2 6.2 6.2 5.6 3.6 3.8 4.8	9.2 8 7.8 - 6.2 6.2 5.8 5 5.8 6.8	40 24 48 24 16 28 32 28 32 48	802 756 - - - - 580 634 - 680	108 126 124 136 130 112 88 80 62 74	
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV	7.4 7.64 7.46 7.21 7.36 7.24 7.23 7.67 7.36 7.51 7.36 7.42 7.56	4.2 3.8 4.4 5.2 5.6 5.2 6.2 6.2 5.6 3.6 3.8 4.8	9.2 8 7.8 - 6.2 6.2 5.8 5 5.8 6.8 5.4 6 4.8	40 24 48 24 16 28 32 28 32 48 32	802 756 - - - 580 634 - 680 694	108 126 124 136 130 112 88 80 62 74 62	
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC	7.4 7.64 7.46 7.21 7.36 7.24 7.23 7.67 7.36 7.51 7.36 7.42	4.2 3.8 4.4 5.2 5.6 5.2 6.2 6.2 5.6 3.6 3.8 4.8	9.2 8 7.8 - 6.2 6.2 5.8 5 5.8 6.8 5.4 6	40 24 48 24 16 28 32 28 32 48 32 33 48	802 756 - - - 580 634 - 680 694	108 126 124 136 130 112 88 80 62 74 62	
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN	7.4 7.64 7.46 7.21 7.36 7.24 7.23 7.67 7.36 7.51 7.36 7.42 7.56	4.2 3.8 4.4 5.2 5.6 5.2 6.2 6.2 5.6 3.6 3.8 4.8	9.2 8 7.8 - 6.2 6.2 5.8 5 5.8 6.8 5.4 6 4.8 8.4 5.6	40 24 48 24 16 28 32 28 32 48 32 48 32 38 32 48	802 756 - - - 580 634 - 680 694 - 688	108 126 124 136 130 112 88 80 62 74 62 - 68	
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB	7.4 7.64 7.46 7.21 7.36 7.24 7.23 7.67 7.36 7.51 7.36 7.42 7.56 7.38	4.2 3.8 4.4 5.2 5.6 5.2 6.2 6.2 5.6 3.6 3.8 4.8 4	9.2 8 7.8 - 6.2 6.2 5.8 5 5.8 6.8 5.4 6 4.8 8.4	40 24 48 24 16 28 32 28 32 48 32 36 28 40	802 756 - - - 580 634 - 680 694 - 688 802	108 126 124 136 130 112 88 80 62 74 62 - 68 84	
2013	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR	7.4 7.64 7.46 7.21 7.36 7.24 7.23 7.67 7.36 7.51 7.36 7.42 7.56 7.38 7.34	4.2 3.8 4.4 5.2 5.6 5.2 6.2 6.2 5.6 3.6 3.8 4.8 4 3 3.6	9.2 8 7.8 - 6.2 6.2 5.8 5 5.8 6.8 5.4 6 4.8 8.4 5.6	40 24 48 24 16 28 32 28 32 48 32 36 28 40 24	802 756 - - - 580 634 - 680 694 - 688 802 786	108 126 124 136 130 112 88 80 62 74 62 - 68 84 90	
	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR	7.4 7.64 7.46 7.21 7.36 7.24 7.23 7.67 7.36 7.51 7.36 7.42 7.56 7.38 7.34 7.68	4.2 3.8 4.4 5.2 5.6 5.2 6.2 6.2 5.6 3.6 3.8 4.8 4 3 3.6 4.1 4.5	9.2 8 7.8 - 6.2 6.2 5.8 5 5.8 6.8 5.4 6 4.8 8.4 5.6 5.8 6.4	40 24 48 24 16 28 32 28 32 48 32 36 28 40 24 28 36	802 756 - - - 580 634 - 680 694 - 688 802 786 -	108 126 124 136 130 112 88 80 62 74 62 - 68 84 90 84	
2013	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY	7.4 7.64 7.46 7.46 7.21 7.36 7.24 7.23 7.67 7.36 7.51 7.36 7.42 7.56 7.38 7.34 7.68 7.96	4.2 3.8 4.4 5.2 5.6 5.2 6.2 6.2 5.6 3.6 3.8 4.8 4 3 3.6 4.1 4.5	9.2 8 7.8 - 6.2 6.2 5.8 5 5.8 6.8 5.4 6 4.8 8.4 5.6 5.8 6.4	40 24 48 24 16 28 32 28 32 48 32 36 28 40 24 28 36 48	802 756 - - - 580 634 - 680 694 - 688 802 786 - - 680	108 126 124 136 130 112 88 80 62 74 62 - 68 84 90 84 90	
2013	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN	7.4 7.64 7.46 7.46 7.21 7.36 7.24 7.23 7.67 7.36 7.51 7.36 7.42 7.56 7.38 7.34 7.68 7.96 7.68 7.84	4.2 3.8 4.4 5.2 5.6 5.2 6.2 5.6 3.6 3.8 4.8 4 3 3.6 4.1 4.5	9.2 8 7.8 - 6.2 6.2 5.8 5 5.8 6.8 5.4 6 4.8 8.4 5.6 5.8 6.4	40 24 48 24 16 28 32 28 32 48 32 36 28 40 24 28 36 48 32	802 756 - - - 580 634 - 680 694 - 688 802 786 - - 680 660	108 126 124 136 130 112 88 80 62 74 62 - 68 84 90 84	
2013	JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL	7.4 7.64 7.46 7.46 7.21 7.36 7.24 7.23 7.67 7.36 7.51 7.36 7.42 7.56 7.38 7.34 7.68 7.96	4.2 3.8 4.4 5.2 5.6 5.2 6.2 6.2 5.6 3.6 3.8 4.8 4 3 3.6 4.1 4.5	9.2 8 7.8 - 6.2 6.2 5.8 5 5.8 6.8 5.4 6 4.8 8.4 5.6 5.8 6.4	40 24 48 24 16 28 32 28 32 48 32 36 28 40 24 28 36 48	802 756 - - - 580 634 - 680 694 - 688 802 786 - - 680	108 126 124 136 130 112 88 80 62 74 62 - 68 84 90 84 90	

	NOV	7.56	5.8	7.2	48	720	74
	DEC	7.48	3.5	8.2	56	692	102
	JAN						
	FEB						
	MAR						
	APR						
	MAY						
2015	JUN						
2015	JUL						
	AUG						
	SEP						
	ОСТ						
	NOV						
	DEC						
	JAN						
	FEB						
	MAR						
	APR					>	
	MAY						
	JUN						
2016	JUL						
	AUG						
	SEP		_				
	OCT						
	NOV						
	DEC						
	JAN						
	FEB						
	MAR						
	APR		>				
	MAY						
	JUN						
2017	JUL						
	AUG						
	SEP						
	OCT						
	NOV						
	DEC						
CANADII	ING POINT		[D/S DEEINIE	 RY, MATHURA	[
PARAM			DO	B.O.D	C.O.D	T.D.S	CL
YEAR	MONTH	PH	(mg/l)	(mg/l)	(mg/l)	ו.ט.ט (mg/l)	(mg/l)
ILAN	JAN	7.5	3.8	9.6	56	812	112
	FEB	7.69	3.2	8.4	32	764	132
				0.7	J 🗸	/ U -1	1 1 1 1 1
2013	MAR	7.38	4	8.2	40	_	122

	MAY	7.32	5.4	6.4	20	_	134
	JUN	7.19	4.6	6.8	36	=	116
	JUL	7.18	5.4	6	40	592	92
	AUG	7.84	5.6	5.4	32	642	82
	SEP	7.51	5.4	6.2	40	-	74
	ОСТ	7.47	3.4	8	56	694	80
	NOV	7.32	3.5	5.8	40	702	66
	DEC	7.38	4.4	6.2	48	-	-
	JAN	7.48	3.8	5.6	32	702	70
	FEB	7.4	2.8	8.8	48	830	92
	MAR	7.48	3.2	6.4	28	792	98
	APR	7.41	3.6	6.4	36	-	88
	MAY	7.58	4.3	6.8	40	-	94
2014	JUN						
2014	JUL	7.34	3.6	8.4	56	687	98
	AUG	7.92	5.2	6.6	40	660	90
	SEP	7.63	5.4	7.2	44	722	108
	ОСТ	7.48	5	7.8	64	750	110
	NOV	7.42	5.2	7.8	56	724	78
	DEC	7.36	3.2	8.6	64	702	106
	JAN						
	FEB						
	MAR						
	APR						
	MAY						
2015	JUN						
2013	JUL						
	AUG						
	SEP						
	ОСТ		>				
	NOV						
	DEC						
	JAN						
	FEB						
	MAR						
	APR						
	MAY						
2016	JUN						
_010	JUL						
	AUG						
	SEP						
	ОСТ						
	NOV						
	DEC						
2017	JAN						

	FEB						[
	MAR						
	APR						
	MAY						
	JUN						
	JUL						
	AUG						
	SEP						
	OCT						
	NOV						
	DEC						
SAMPL	ING POINT			U/S SHAHPI	UR, MATHURA		
PARAN			DO	B.O.D	C.O.D	T.D.S	CL
YEAR	MONTH	PH	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
	JAN	7.42	3.2	12.2	64	716	120
	FEB	7.46	4.8	7.8	24	698	116
	MAR	7.32	4.2	6.8	32	696	122
	APR	7.43	4.8	8	24	778	138
	MAY	7.63	5.6	7	16	712	142
2012	JUN	7.67	4.8	6.4	24	698	118
2013	JUL	7.36	5.4	5.8	20	596	64
	AUG	7.6	7.6	4.8	16	624	60
	SEP	7.46	7.2	6.4	24	712	78
	ОСТ	7.16	7.4	5.2	20	624	68
	NOV	7.39	4.6	7.2	40	702	78
	DEC	7.33	3.8	5.6	36	716	70
	JAN	7.49	3.4	6	32	728	62
	FEB	7.56	3.2	9.6	48	822	98
	MAR	7.61	4.2	7.4	32	768	102
	APR	7.68	4	6.2	24	692	92
	MAY	7.28	4	7.2	36	684	82
2014	JUN	7.48	4.2	6.4	32	680	90
	JUL	7.68	4	8.2	48	680	98
	AUG	7.02	4.6	6.6	36	662	82
	SEP	7.58	6.6	5.4	28	750	104
	ОСТ	7.56	5.8	6.6	48	747	94
	NOV	7.86	6.4	6.2	40	708	72
	DEC	7.36	6	7.8	56	700	78
	JAN	7.44	4	8.6	64	718	86
	FEB	7.16	4.4	7.6	40	706	78
	MAR	7.67	5.2	8.4	56	662	92
2015	APR	7.68	4.8	9.2	64	704	104
	MAY	7.43	5.4	7.6	40	698	92
	JUN	7.63	5.6	8.4	56	662	78
	JUL	7.67	5.6	6.8	48	662	96

	AUG	7.48	6.4	7.2	40	624	84
	SEP	7.34	6.2	6.4	56	638	68
	ОСТ	7.36	5.6	7.2	48	680	74
	NOV	7.8	6.2	6.6	40	656	68
	DEC	7.56	5.8	6.2	48	618	64
	JAN	7.46	4.8	7.4	56	662	92
	FEB	7.56	5.6	7.2	44	714	126
	MAR	7.82	5.4	8	56	-	116
	APR	7.84	5.6	6.8	48	662	98
	MAY	8.23	4.9	8.2	64	650	124
2016	JUN	7.61	6.1	6.4	40	682	112
2016	JUL	7.46	5.8	7.6	56	630	164
	AUG	7.46	6	6.2	44	662	148
	SEP	7.48	6.2	6.8	40	706	136
	ОСТ	7.71	5.9	7.6	56	652	148
	NOV	7.71	6.1	6.8	48	662	136
	DEC	7.97	5	7.4	56	658	144
	JAN	7.48	5.4	6.6	40	664	152
	FEB	7.9	5.8	6.2	44	594	144
	MAR	7.68	3.8	7.8	56	612	152
	APR	7.58	4.8	6.4	44	598	142
	MAY	7.81	6.1	7.2	48	646	158
2017	JUN	7.46	5.6	6.2	36	618	140
2017	JUL	7.4	5.6	6.4	52	710	140
	AUG	7.04	6.8	7.4	50	670	156
	SEP	7.62	6.9	7.4	56	648	132
	ОСТ	7.12	3.2	10.8	82.2	753	175
	NOV	7.16	3.6	10	80	810	-
	DEC	7.32	2.2	14	60	740	-
SAMPL	ING POINT			D/S SHAHP	UR, MATHURA	\	1
PARAN	METER	PH	DO	B.O.D	C.O.D	T.D.S	CL
YEAR	MONTH		(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
	JAN	7.56	2.8	12.4	56	724	126
	FEB	7.58	3.8	8.2	32	702	124
	MAR	7.26	3.8	7.6	40	704	128
	APR	7.31	4.2	8.4	32	780	140
	MAY	7.6	5.4	7.6	24	726	146
2013	JUN	7.84	4.2	6.6	32	-	122
	JUL	7.26	4.9	6	24	620	68
	AUG	7.3	7.3	5.2	20	710	66
	SEP	7.49	6.5	6.8	32	724	82
	ОСТ	7.32	7.2	5.6	24	630	74
	NOV	7.46	4.3	7.6	48	724	82
	DEC	7.2	3.6	6	40	724	72
2014	JAN	7.52	3	6.4	48	728	68

	FEB	7.48	2.8	10.4	56	838	104
	MAR	7.58	3.6	7.8	40	774	108
	APR	7.56	3.8	6.6	28	702	96
	MAY	7.36	3.8	7.6	40	690	84
	JUN	7.61	3.8	6.8	48	690	94
	JUL	7.53	3.6	8.6	56	678	102
	AUG	7.16	4.2	6.8	44	654	88
	SEP	7.55	6.2	5.6	36	748	112
	ОСТ	7.84	5.2	7.2	52	748	98
	NOV	7.92	6	6.8	44	710	76
	DEC	7.28	6.2	8.4	64	698	82
	JAN	7.38	3.8	9.2	72	728	90
	FEB	7.36	4.2	7.8	48	706	84
	MAR	7.52	4.9	8.8	64	676	96
	APR	7.64	4.4	9.6	72	714	110
	MAY	7.77	5	7.8	48	718	96
2015	JUN	7.59	5.3	8.8	64	668	82
2015	JUL	7.82	5.3	7.4	56	666	98
	AUG	7.57	6.2	7.4	48	622	88
	SEP	7.56	5.6	6.8	64	648	72
	ОСТ	7.42	5.2	7.6	56	690	80
	NOV	7.75	5.9	6.8	48	656	72
	DEC	7.63	5.4	7.2	56	626	68
	JAN	7.38	4.4	7.8	64	652	98
	FEB						
	MAR	7.59	5.2	7.6	46	722	130
	APR	7.79	5.2	7.6	56	662	102
	MAY	8.15	4.6	8.8	72	654	132
2016	JUN	7.54	5.8	7.2	48	686	116
2010	JUL	7.38	5.4	7.8	64	626	172
	AUG	7.68	5.8	6.4	48	664	152
	SEP	7.65	6	7.2	56	716	144
	ОСТ	7.64	5.6	7.8	64	664	156
	NOV	7.73	5.9	7.2	56	692	142
	DEC	7.62	4.8	7.6	64	661	148
	JAN	7.82	5.2	6.8	48	679	158
	FEB	7.78	5.5	6.4	52	623	146
	MAR	7.96	3.4	8.2	64	624	158
	APR	7.51	4.6	6.8	56	607	148
2017	MAY	7.77	5.8	7.6	64	672	162
,	JUN	7.51	5.4	6.6	48	628	144
	JUL	7.14	5.8	6.4	40	678	146
	AUG	7.77	6.6	7.9	52	694	143
	SEP	7.59	6.3	7.2	52	664	148
	ОСТ	6.91	3.1	11.2	88	766	180

NOV	6.8	4.2	12	84	833	-	
DEC	7.34	2.3	16	64	826	-	

Annexure 2.2: Location of Air Quality Monitoring Stations in TTZ Agra



Annexure 2.3: List of Vegetation Found in TTZ

S.NO	COMMON NAME	SCIENTIFIC NAME
1	Sage-leaved alangium	Alangium salvifolium (Linn. f.) wang.
2	Hummingbird tree	Sesbania grandiflora, (Linn. f.) Pers.
3	Winged myrobalan	Terminalia arjuna, W. & A.
4	Lemon Guava/ Common	Psidium guajava, Linn.
	Guava	
5	Golden shower tree	Cassia fistula, Linn.
6	Tree of heaven	Ailanthus excelsa, Roxb.
7	Mast tree/ Ashok	Polyalthia longilfolia, Thw.
8	Silver grey wood	Terminalia alata, Heyne Ex. Roth.
		Syn Terminalia tomentosa, W.& A.
9	Indian Mango	Mangifera indica, Linn.
10	Wild Mango	Spondias pinnata, Linn.
11	Peach	Prunus persica, Stokes
12	Indian mulberry	Morinda tinctoria Roxb,
13	Indian gooseberry	Emblica officinalis, Gaetrn.
14	Indian black wood	Hardwickia binata Roxb.
15	Common fig	Ficus carica, Linn.
16	Tamarind	Tamarindus indica, Linn.
17	Hairy sterculia/ Elephant	Sterculia villosa, Roxb.
	rope tree	
18	Orchid tree	Bauhinia veriegata, Linn.
19	Kaim/ True kadamb	Mitragyna parvifolia, Korth.
20	Burflower- tree/ Leichhardt	Anthocephalus cadamba, (mig)
	pine	
21	Buttontree	Anogeissus pendule, Edgew.
22	Indian beech	Pongamia pinnata, (Linn.) Piers.
23	Jack tree/ Jakfruit	Artocarpus heterophyllum, Lamk.
24	Katsagon tree	Haplophragma adenophyllum, (Wall.) Dop.
25	Assamese/ Chironji	Buchanania lanzan, Spreng., Sym. Buchanania latifolia, Roxb.
26	Manla laguad Rayur troo/	Pterospermum acerifolium, Willd.
20	Maple-leaved Bayur tree/ Kanak champa	Pterospermam acenjonam, wina.
27	Caranda/ Plum	Carissa carandus
28	Thorny nightshade/ Kanteli	Solanum surattense, Burm. F.
29	Indian Plum	Flacourtia indica, Merr.
30	Crested Fever Nut	Caesalpinia crista Linn.
31	Sausage tree	Kigelia pinnata D. C.
32	Jelly bean tree/ Jerusalem	Parkinsonia aculeate, Linn.
	thron	
33	Surur	Phoebe lanceolata, Nees.
34	Bhorghoti/ Cotte	Ziziphus xylopyrus, Willd.
35	Logwoods/ Dandal	Xylosma longifolium, Clos.
36	Common Grey Mango Laurel	Litsea monopetala, Jubb (roxb.) Pers.
37	Fragrant Bay tree	Machilus odoratissima, Nees.
38	Himalayan Maple	Acer oblongum, Linn.
39	Hoom	Miliusa tomentosa, (Roxb) Sinclair
40	Bakota Palm	Flacourtia indica, (Burm. F.) merr.

41	Cambola/ Starfruit	Averrhoa carambola, Linn.
42	Cassia tree/ Kassod tree	Cassia siamea, Lamk.
43	Wood apple	Feronia limonia, (Linn.) Swingle.
44	Bueatyberry tree	Callicarpa arborea, Roxb.
45	Hairy fig/ Devil fig	Ficus cunia, Bush & Ham.
46	Ceylon oak/ Macassar oil	Schleicher oleosa, Lour. Syn. Schleichera trijuga, Willd.
	tree	, , , , , , , , , , , , , , , , , , , ,
47	Indrajao/ Kurchi	Holarrhena antidysenterica, Wall.
48	Bombay ebony	Diospyros cordifolia, Roxb.
49	Lebbek tree/ flea tree	Albizia lebbek, Benth.
50	Indian tragacanth/ Gum	Sterculia urens, Roxb.
	karaya	
51	Wild guava	Careya arborea, Roxb.
52	Oleander	Nerium indicum, Mill.
53	Irvine/ Yellow Oleander	Thavetia nerifolia, Juss.
54	Key lime	Citrus aurantifolia, (Chnistm.) Swingle
55	Indian Elm/ Jungle Cork tree	Holoptelea integrifolia, Planch.
56	Eastern Nettle tree	Celtis tetrandra, Roxb.
57	Spinous Kino tree	Bridelia restusa, Sprengel
58	White fig	Ficus infectoria, Roxb. Syn. Ficus rumphii, Bl.
59	White date palm	Phoenix sylvestris, Roxb.
60	Mustard tree	Salvadora persica, Linn.
61	-	Gardenia turgida, Roxb.
62	Grey downy balsam	Garuga pinnata, Roxb.
63	Ceylon Iron Wood	Manilkara hexandra, (Roxb.) Dub.
64	Black cutch	Acacia catechu, Willd.
65	Pala indigo/ dyer's oleander	Wrightia tinctoria, R.Br.
66	Pale Sterculia	Sterculia pallens, Wall.
67	Khejri tree/ Indian mesquite	Prosopis spicigera, Linn.
68	Indian charcoal tree/ Indian	Trema politoria, (Planch) B.
	nettle	
69	Malabar Bauhinia	Bauhinia malabarica, Roxb.
70	Wedgeleaf fig	Ficus semicordata, J.E. Smith
71	Punjab fig	Ficus palmata, Forsk.
72	White teak/ Beechwood	Gmelina arborea, Roxb.
73	Buttercup tree	Cochlospermum religiosum, (Linn.) Alston
74	False white teak	Trewia nudiflora, Linn.
75	Cluster fig tree	Ficus glomerata, Roxb.
76	Flame Tree	Delonix regia, (Broj.) Raf.
77	Grey-leaved saucer berry	Cordia rothii, Roem & schult
78	-	Themedia quadrivalis, Linn.
79	-	Engelhardtia coledrivalris, Linn.
80	Common olive	Olea glandulifera, Wall. Ex. Dm.
81	Gogan	Saurauia napaulensis, DC.
82	Marsh mallow	Althea officinalis, Linn.
83	Marigold	Tagetes erecta, Linn.
84	Jewel Vine/Hog creeper	Derris scandens, Benth.
85	Weaver's Beam tree	Schrebera swietenioides, Roxb.
86	Bhorghoti/ Ghoti	Zayphus xylopyra, (Retz.) Willd.
87	Pomelo	Citrus maxima, Merr. & Lee.

88	Sandalwood	Santalum album, Linn.
89	Toothed Leaf Chilla	Casearia tomentosa, Roxb.
90	Rushfoil	Croton roxburghii, Bel.
91	Common tallow laurifolia	Litsea chinensis, Lamk.
92	-	Wendlandii excreta, (Roxb.) DC.
93	Blackboard tree	Alstonia scholaris, Brown.
94	Khejri Tree	Prosopis cineraria, (Linn.) D.ruce.
95	Milk wood pine	Alstonia scholaris, (Linn.) R. Br.
96	Queen Crape Myrtle	Lagerstroemia flos reginae, Retz.
97	Manilla Tamarind	Pithecellobium dulce, Benth.
98	Blue Jacaranda	Jacaranda mimosifolia, D. Don.
99	Ceylon Tea	Elaeodendron glaucum, Pers.
100	Indian Willow	Salix tetrasperma, Roxb.
101	Java Plum	Syzygium cumini, (Linn.) Skeels.
102	Gypsywort	Lycopus europaeusin.
103	-	Ficus semicorpa, Ham. Ex. Sm.
104	Indian Tamarisk	Tamarix dioica, Roxb.
105	Indian Ash Tree	Lannea coromandelica, Hontt. Syn. Lannea grandis, Engl.
106	Bastard teak	Butea monosperma. (Lamk.) Taub.
107	Wine Palm	Borassus flabellifer, Linn.
108	Chinese Tallow tree	Sapium sebiferum, Roxb.
109	Red cedar	Toona ciliata, Roxb.
110	Coromandel ebony	Diospyrus melanoxylon, Roxb.
111	Laurel-leaved snail tree	Cocculus laurifolius, DC.
112	Giant Indian Fig	Ficus roxburghii, Wall.
113	Winged Prickly Ash	Zanthoxylum alatum, Roxb.
114	-	Wendlandia boynei, DC.
115	Orange wild rhea	Debregeasia longifolia, (Burn.)
116	Hoary Stock	Matthiola incana, R. Br.
117	Kurchi	Holarrhena antidysenterica, Will.
118	Dhaman	Grewia tiliaefolia, Wahi.
119	Axlewood	Anogeissus latifolia, Wall.
120	Triangular Spurge	Euphorbia antiqorum, Linn.
121	Mountain Gardenia	Gardenia turgid, Roxb.
122	Indian Coral tree	Erythrina suberosa, Roxb.
123	Jimson weed	Datura stramonium, Linn.
124	Small Flowered Crape Myrtle	Lagerstroemia parviflora, Roxb.
125	-	Centipeda minima, (I) A.Br. & Aschera
126	Key lime	Citrus aurantium, Linn.
127	European pear	Pyrus communis, Linn.
128	Sweet lime	Citrus limmettioides, Tanaka.
129	Neem/ Indian Lilac	Azadirachta indica, A. Juss.
130	White Butterfly Bush	Buddleja asiantica, Lour.
131	Chilla	Casearia gravolens. Dalz.
132	Ceylon Boxwood	Gardenia latifolia, Aiton
133	Java Fig	Ficus lacor, Buch- Hum.
134	Indian Elm	Holoptelea integrifolia, (Roxb.) Planch.
135	Monk Bodh tree	Ficus rumphii, Bl.
136	Bodhi tree/ Peepal tree	Ficus religiosa, Linn.
137	Divine jasmine	Randia uliginosa, D.C.

138	Bada Peelu	Salvadora oleoides, Deene.	
139	Kydia/ Pula	Kydia calycina Roxb.	
140	Lucky bean tree	Putranjiva roxburighii, Well.	
141	Paper Mulberry	Broussonetia papyrifera, Well.	
142	Koda tree/ Brown-Cedar	Ehretia acuminata, Roxb.	
143	True Kadam	Mitragyna parvifolia, Korth.	
144	Athel pine	Tamarix aphylla, (Linn) Karst.	
145	Phalsa Tree	Grewia asiatica, Linn.	
146	Thorn mimosa	Acacia nilotica, (I.) Willd.	
147	Banyan Tree	Ficus bengalensis, Linn.	
148	Bastard Myrobalan	Terminalia bellerica, Roxb.	
149	Chinaberry tree	Melia azaderach, Linn.	
150	Arani	Premna latifolia, Roxb.	
151	Monkey Jack	Artocarpus lakoocha, Roxb.	
152	Indian Kino tree	Pterocarpus marsupium, Roxb.	
153	Golden Apple	Aegle marmelos, Corr.	
154	Indian Plum	Ziziphus mauritiana, Lam.	
155	Vaivarun	Crataeva odora Buch, Ham.	
156	Bairola	Cordia vestita, HK. F. & Tn.	
157	Black Siris/ Ceylon rosewood	Albizia odoratissima, Benth.	
158	Mountain Spike Throne	Gymnosporia spinosa, Forsk.	
159	Abar	Hymenodictyon excelsum, (Roxb.) (Wall.)	
160	Indian Butter tree	Madhuca indica, Gmel.	
161	Bidi leaf tree	Bauhinia racemosa, Lamk.	
162	Spanish Cherry/ Tanjong tree	Mimusops elengi	
163	Sweet Orange	Citrus sinensis, Linn.	
164	Soft Bollygum	Litsea glutinosa, C.B. Robinson	
165	-	Randia uliginosa, (Thunb) Keay.	
166	Chinese thuja	Thuja orientialis, Linn.	
167	Rose gum	Eucalyptus hybrid, L'Herit.	
168	Kuteera Gum/ White Bark	Acacia leucophloea, Willd.	
	Acacia		
169	Toothbrush tree	Streblus asper, Lour.	
170	Fragrant Manjack/ Glue	Cordia dichotoma, Forest. F.	
	berry		
171	Velvet mesquite	Prosopis juliflora, D.C.	
172	Sandan	Ougeinia oogeinensis, Roxb. Syn. Ougeinia dalbergioides,	
		Benth.	
173	Sugar Apple/ Custard Apple	Annona squamosa, Linn.	
174	Indian Rosewood	Dalbergia sissoo, Roxb.	
176	White Mulberry	Morus alba, Linn.	
177	Teak	Tectona grandis, Linn. F.	
178	Silk tree/ Chinese Albizia	Albizia chinensis, (Osbeck) Merr. Syn. AlbAzia stipulata, Boiv.	
179	White Siris/ Tall Albizia	Albizia procera, Benth.	
180	Cotton tree	Bombax Malabaricum, D.C.	
181	Drumstick tree	Moringa oleifera, Lamk.	
182	-	Hesperethusa crenulata, (Roxb.) Roem.	
183	Southern silky oak	Grevillea robusta, A. Cunn.	
184	Night-flowering jasmine	Nyctenthes arbortristis, Linn.	
	3 : : =g j=3	, 	

185	Chebulic Myrobalan	Terminalia chebula, Ratz.
186	Haldu	Adina cordifolia, Hook. F.
EXOTIC SPECIES		
187	White leadtree/ River	Leucaena leucocephala
	tamarind	20000000 1000000p//.a/a
188	Cottonwood	Populus, Spp. Peltophorum, Spp. Parkinsonia aculeate,
		Linn.
		HERBS AND SHRUBS
189	Mullein nightshade	Solanum verbascifolium, Linn.
190	Rubber Bush	Calotropis procera, R. Br.
191	Pigeon Pea	Cajanus cajan, (Linn) Millsp.
192	Adusa, Malabar Nut	Adhatoda vasica, Nees.
193	Arni	Clerodendron phlomoidis, Linn.
194	Indian Globe Thistle	Echinops echinatus
195	Karira	Capparis deciduas, (Forsk) Edgw.
196	Bell mimosa/ Sicklebush	Dichrostachys cinerea, (Linn) W & A
197	Wild-sage/ Red-sage	Lantana camara, Linn.
198	Indian Mallow	Abutilon indicum, (Linn) sweet
199	Jharber	Ziziphus nummularia, (Burm. F.) W & A
200	Curry tree	Murraya Koeingil, Spreng.
201	White Crossberry	Grewia tenax, (Forsk) Friori.
207	Indian squill	Urginea indica, kanth.
208	Camelthrone-bush	Alhagi camelorum, Fisch
209	Holy Basil/ Tulsi	Ocimum sanctum, (Linn.)
210	Fire Flame Bush	Woodfordia fruticoss, kurz.
211	Hairy indigo	Indigofera hirsuta, Linn.
212	Sickle Senna	Cassia tora, Linn.
213	Cat tail	Typha elephantina, Roxb.
214	Rattlepods	Crotalaria medicaginea, Lam.
215	Karbi	Grewia sclerophylla, Roxb. Ex. C Don.
216	Gallow grass	Cannabis Sativa, Linn.
217	Hill glory bower	Clerodendron viscosum, Vent.
218	Bush tomato	Solanum indicum, Lam.
219	Emetic nut tree	Randia dumetorum, Linn.
220	Nut-leaved screw tree	Helicteres isora, Linn.
221	Control plant	Vitex negundo, Linn.
222	Sentry plant	Agave Americana, Linn.
223	Wild indigo Adonda	Tephrosia purpurea, (Linn) Dilile.
224	Adonda	Capparis zeylanica, Linn. VINES AND GRASSES
225	Devils' Hair	Cuscuta reflexa, Roxb.
226	- Deviis Hall	Mimosa himalayana, Gamble
227	Caper bush	Capparis sepiara, Linn.
228	Mysore thorn	Caesalpinia decapetala
229	Helicopter flower	Hiptage benghalensis, Linn. Kurz.
230	Indrayan	Trichosanthes bracteata, (Linn) Voigt.
231	Ulla grass	Themeda arundinacea, (Roxb.)
232	-	Combretum decandrum, Roxb.
233	-	Ventilago cennata tulane.
234	Climbing wattle	Acacia pennata, Willd.
'		

235	Ivy gourd	Coccinia indica, W. & A.	
236	-	Mucuna prurita, Hook.	
237	_	Narenga porphyrocoma, (Hence) Bor.	
238	Red grass	Themeda, Spp.	
239	Velvet bean	Mucuna pruriens, (Linn.) D.C. Hook.	
240	Orange climber	Toddalia asiatica, (Linn.) (Lamk.)	
241	-	Milletia auriculata, Baker.	
242	Rosary pea/ Crab's eye	Abrus precatorius, Linn.	
243	Rubber vines	Cryptostegia grandiflora, (Roxb.) R. Br.	
244	Broom creeper	Cocculus Hirsutus, (Linn.) Diels	
245	Jugter	Aspidopterys wallichii, Hook. F.	
246	Ravenna grass	Erianthus ravennae, P. Beaw.	
247	Desert Maerua	Maerua arenaria, H.K.F. and Them.	
248	Black creeper	Ichnocarpus frutescens, Air & Ait. F.	
249	Bread flower	Vallaris solanacea, (Retz.) O. Ktze.	
250	Chinese Cucumber	Machulure cochinchinensis, (Lour) Corner.	
251	-	Syn. Cudrania javanensis trewim comosum, Wall.	
252	Tall Reed	Phragmites karka, Trin ex. Steud.	
253	Turpeth	Operculina turpethum, (Linn.) Silva Manso.	
254	Wavy leaved Cissus	Vitis repanda, W. & A.	
255	Pointed ground	Trichosanthes dioica, Roxb.	
256	Velvet leaf	Cissampelos pareira, Linn.	
257	Elephant grass	Typha angustata, Bory & Chaub.	
258	Spear grass	Heteropogon contortus, Beauv.	
259	Broom grass	Thysanolaena maxima, (Roxb.)	
260	Abuta/ Velvet leaf	Cissampelos pareira, Linn.	
261	Butea Gum Tree	Butea superba, Roxb.	
262	Reed grass	Phragmites karka, Trin. Ex.	
263	Indian silver creeper white corallita	Porana paniculata, (Roxb.)	
264	-	Calamus tenuis, Roxb.	
265	Honey Suckle Mistletoe	Dendrophthoe falcate, Linn. F.	
266	-	ZAyphus ceonoplia, Mill.	
267	Black oil plant	Celastrus paniculatus, Willd.	
268	Roha grass	Cymbopogon martini, (Roxb.)	
269	Munj	Saccharum bengalense, Retz. Syn.	
270	-	Butea parviflora, Roxb. Syn.	
271	Wax leaved Climber	Cryptolepis buchanani, R. & S.	
272	-	Abrus precatorius, Linn.	
273	-	Combretum roxburghii, Roxb.	
274	Climbing asparagus/ Wild root	Asparagus racemosus, Willd.	
275	Indian Kudzu	Pueraria tuberose, (Willd) DC.	
276	Air potato	Dioscorea bulbifera, Boigt.	
277	African foxtail	Cenchrus ciliaris, Linn.	
278	Droopsday	Sporobolus marginatus, Hochst. Ex. A. Rich	
279	Kans grass	Saccharum spontaneum, Linn.	
280	Guria grass	Chrysopogon fulvus, Chiov.	
281	Black speargrass	Heteropogon contortus, (Linn) Bauy. Ex Roemet Schult.	
282	Vetiver	Vetiveria zizanioides, Nash.	

283	Beard grass	Andropogon pumilus, Roxb.	
284	Kangaroo grass	Themeda quadrivalvis , (Linn) O. Ktze.	
285	-	Chrysopogon montanus, Trin	
286	Hurricane grass	Bothriochloa pertuse, (Linn) A. Camus.	
287	Marvel grass	Dichanthium annulatum, (Forsk Stapf.)	
288	Halfa grass	Desmostachya bipinnata, Stapf.	
289	Bermuda Grass	Cynodon dactylon, (Linn) P. Beauv.	
290	Mauritian grass	Apluda mutica, Linn.	
291	Munja	Saccharum munja, (Roxb.)	
292	-	Eremopogon faveotatus, (Del) stapf.	
293	-	Iseilema laxum, Hack.	
294	Lemon grass	Cymbopogon martini Roxb. Wats.	
295	-	Aristida depressa, Retz.	
296	Cogon grass	Imperata cylindrica, (Linn) P. Beauv.	
297	Rattail grass	Sehima nervosum, (Rottl) stapf.	
298	Finger grass	Chloris dolichostachya, Lag.	
		BAMBOOS	
299	Bamboo	Dendrocalamus strictus, (Roxb.) Nees.	
300	Indian thorny bamboo	Bambusa arundinacea, Willd.	
301	Solid bamboo	Dendrocalamus hamiltonii, Nees & Arn.	
	OTHER SPECIES		
302	Gaint Dodder Cuscuta reflexa, Roxb.		
303	Honey Suckle Mistletoe	Dendrophthoe falcate, (Linn.) f.	
304	-	Helixanthera coccinea, (Jack.)	
305	-	Oplidmrnud vompodiyud, (L.) Beauv	

Annexure 2.4: List of Wildlife Present in TTZ as per Working Plan Document

S.NO.	COMMON NAME	SCIENTIFIC NAME		
	CLASS: MA	AMMALIA		
	ORDER: PRIMATA			
1	Rhesus Monkey	Macaca mullatta		
2	Hanuman Langur	Semnopithecus entellus		
	ORDER: CA	RNIVORA		
	Family: Felidae			
3	Leopard	Panthera pardus		
4	Jungle cat	Felis chaus (Gray)		
5	Bengal Tiger	Panthera tigris		
6	Caracal	Felis caracal		
	Family: M			
7	Ratel/ Honey Badger	Mellivora capensis		
8	Smooth Indian Otter	Lutra perspicillata		
	Family: (Canidae		
9	Jackel	Canis aureus		
10	Bengal Fox	Cuon alpines		
11	Gray Wolf	Canin lupus		
12	Indian Fox	Vulpes bengalensis		
	Family: Hy			
13	Striped Hyaena	Hyaena hyaena		
	ORDER: UI			
	Family: Ar			
14	Nilgai	Boselaphus tragocamelus		
	Family: C			
15	Spotted Dear	Axis axis		
	Family:			
16	Wild Pig	Sus scrofa		
	ORDER: R			
17	Five Striped Palm Squirrel	Funamubulus pennant		
18	Three Striped Palm Squirrel	Fanamubulus palmarum		
19	Common Giant Flying Squirrel	Petaurista petaurista		
20	Common House Rat	Ratus ratus		
21	House Mouse	Mus musculus		
22	Indian Field Mouse	Mus booduga		
23	Indian Porcupine	Hystrix indica		
	ORDER: LAG			
24	Hare	Lepus nigricollis		
	ORDER: CH			
25	Common Yellow-Bellied Bat	Scotophilus heathi		
26	Short-nosed Fruit Bat	Cynopterus sphinx		
CLASS: AVES				
	Family: Phala	I		
27	Little Cormorant	Phalacrocorax niger		

28	Darter	Ahinga rufa
20	Family: A	
29	Grey Heron	Ardea cinera
30	Pond Heron	Ardeola grayii
31	Cattle Egret	Bubulcus ibis
32	Little Egret	
32	Family: Ci	Egretta garzetta
33	Painted Stork	Mycteria leucocephala
34	White-necked Stork	Ciconia episcopus
35	Black-necked Stork	Ephippiorhynchus asiaticus
33	Family: Thres	
36	Black Ibis	Pseudibis papillosa
30	Family: A	
37	Barheaded Goose	Anser indicus
38		
39	Lesser Whistling Teal Pintail	Dendrocygna javanica Anas acuta
40	Common Teal	
41	Spot Billed Duck	Anas crecca Anas poecilorhyncha
42	Mallard	Anas platyrhynchos
43	Gadwall	
44		Anas strepera
45	Wigeon Red crested Ponchard	Anas penelope Netta rufina
-		
46	White-eyed Ponchand Cotton Teal	Aythya nyroca
47	Comb Duck	Nettapus coromandelians Sarkidiornis melanotos
48	Family: Ac	
49	Brahminy Kite	Haliastur indus
50	Pallas' Fishing Eagle	Haliaeetus leucoryphus
51	Black/ King Vulture	Sarcogyps calvus
52	Indian White backed/ Bengal Vulture	Gyps bengalensis
53	Scavenger Vulture	Neophron percnopterus
	Family: Ph	
54	Black Patridges	Francolinus francolinus
55	Grey Patridges	Francolinus pondicerianus
56	Common/ Grey Quail	Coturnix coturnix
57	Jungle Bush Quail	Perdicula asiatica
58	Red Jungle Fowl	Gallus gallus
59	Peafowl	Pavo cristatus
	Family: 0	
60	Sarus Crane	Grus antigone
	Family: I	_
61	White Breasted Water Hen	Amaurornis phoenicurus
62	Moorhen	Gallinula chloropus
63	Coot	Fulica atra
Family: Jacanidae		
64	Pheasant Tailed Jacana	Hydrophasinus chirurgus
	ı	

65	Pronzo Wingod Iscans	Metopidius indica	
03	Bronze Winged Jacana	-	
66	Family: Charadridae 66 Red Wattled Lapwing Vanellus indicus		
67	Red Wattled Lapwing Spur Winged Lapwing	Vanellus spinosa	
68	Curlew	Numenius arquata	
08	Family: Co		
60	•		
69	Yellow Footed Geen Pigeon	Treron phoenicoptera	
70	Red Turtle Dove	Streptopelia tranquebarica	
71	Spotted Dove	Streptopelia chinensis	
72	Little Brown Dove	Streptopelia senagalensis	
73	Emerald Dove	Chalcophaps indica	
7.4	Family: Ps		
74	Alexandrian Parakeet	Psittacula eupatria	
75	Rose Ringed Parakeet	Psittacula krameri	
76	Blossom Headed Parakeet	Psittacula cyanocephala	
	Family: C		
77	Pied Crested Cuckoo	Clamator jacobinus	
78	Koel	Endynamys scolopacea	
	Family: S		
79	Jungle Owlet	Glaucidium radiatum	
	Family: Cap	rimulgidae	
80	Little/Indian Nightjar	Caprimulgus asiaticus	
	Family: Ald	cedinidae	
81	Lesser Pied Kingfisher	Ceryle rudis	
82	Small Blue Kingfisher	Alcedo atthis	
83	Stork-Billed Kingfisher	Pelargopsis capensis	
	Family: M	leropidae	
84	Green Bee-Eater	Merops orientalis	
	Family: Co	oraciidae	
85	Indian Roller/ Blue Jay	Coracias benghalensis	
	Family: U	lpupidae	
86	Hoopoe	Upupa epops	
	Family: Bu		
87	Common Grey Hornbill	Tockus birostris	
	, Family: Ca		
88	Large Green Barbet	Megalaima zeylanica	
89	Crimson Breasted Barbet	Megalaima haemacephala	
	Family:		
90	Lesser Golden backed Woodpecker	Dinopium benghalense	
91	Yellow-Fronted Pied Woodpecker	Picoides mahrattensis	
	Family: Hir		
92	Swallow	Hirundo rustica	
	Family: L		
93	·		
94	Bay Backed Shrike	Lanius vittatus	
	Day Dacked Stilling	Laas victatas	

127	Karait	Bungarus careules	
	CLASS: PISCES		
	Family: Notopteridae		
128	Chitala	Notopterus chitala	
	Family: Cy	/prinidae	
129	Catla	Catla catla	
130	Reba Crap	Cirrhinus reba	
131	Mrigal	Cirrhinus mrigala	
132	Black Rohu/ Orange Fin Labeo	Labeo calbasu	
133	Kuria Labeo	Labeo gonius	
134	Rohu/ Rui	Labeo rohita	
135	Spotfin Swamp Barb	Puntius sophore	
136	Firefin Barb	Puntius ticto	
	Family: B	Bagridae	
137	Long-Whiskered Catfish	Mystus aor	
138	Singara/ Pogal	Mystus seenghala	
	Family: Sc		
139	Silond Catfish/ Silon	Silonia silondia	
140	River Catfish/ Bacha	Eutropiichthys vacha	
	Family: Sacch		
141	Stinging Catfish/ Kadu	Heteropneustes fossilis	
	Family: Clariidae		
142	Freshwater Catfish/ Magur	Clarias batrachus	
	Family: Ophi	,	
143	Bullseye Snakehead	Channa marulius	
	Family: Amphipnoidae		
144	Swamp eel	Amphiphnous cuchia	
	Family: Maste		
145	Spiny eel	Mastacembelus cuchia	
	Family: Clupeidae		
146	Indian River Shad	Gudusia chapra	

Annexure 2.5: List of Industries - Classification into Red, Orange and Green

	LIST OF RED INDUSTRIES			
S.NO	NAME AND ADDRESS OF INDUSTRIES	CATEGORY		
1	Arvind Vehicles Pvt. Ltd., 1806-1810, Basai	Automobile Industry		
	Mustikal, Fatehabad Road, Agra			
2	Sunny Motors Pvt. Ltd., 632, Artoni, Agra	Automobile Industry		
3	Hindustan Cycle Industries, 28, Ind. Estate,	Automobile Industry		
	Nunhai, Agra			
4	M.G.R. Automobiles Pvt. Ltd., Khasra No. 2,	Automobile Industry		
	Mathura Road, Agar	<u> </u>		
5	Siyaram Motors Pvt. Ltd., B-16, Site-A,	Automobile Industry		
	UPSIDC, Sikendra, Agra			
6	India Auto Rings, 116, Ind. Estate, Nunhai,	Automobile Industry		
	Agra			
7	Agra Oil and General Industry, Hathras Road,	Oil and Petroleum Industry		
	Naraich, Agra			
8	B.P. Oil Mills Ltd., Unit-2, 12/17 B, Ngala Bal	Oil and Petroleum Industry		
	Chand, Nunhai, Agra			
9	Indian Oil Corporation Limited, Etmadpur,	Oil and Petroleum Industry		
	Agra			
10	Indian Oil Corporation Limited, Tundla, Agra	Oil and Petroleum Industry		
11	Mahesh Edible Oil Industries Ltd., Gopalpura,	Oil and Petroleum Industry		
	Shamsabad, Agra			
12	Panguriya Oil Mills Pvt. Ltd., Bha Road,	Oil and Petroleum Industry		
	Fatehabad, Agra			
13	Sharda Oil Industries Pvt. Ltd., Nunhai, Agra	Oil and Petroleum Industry		
14	Confidence Petroleum India Ltd., Agra	Oil and Petroleum Industry		
15	Hindustan Petroleum Corporation, Agra	Oil and Petroleum Industry		
16	Saheed Hamendra Singh Filing Station,	Oil and Petroleum Industry		
	Pathauli, Jaipur Road, Agra			
17	ABC Beverages Pvt. Ltd., E-67, Site-C,	Coke Making Industry		
	UPSIDC, Sikandra, Agra			
18	ARVC Sons Beverages and Food Pvt. Ltd.,	Coke Making Industry		
	914/1, Nagla Laldas, Kirauli Road, Runakta,			
	Agra			

19	Balaji Beverages, E-35, Site C, Sikandra, Agra	Coke Making Industry
20	Care Food & Beverages, Agra	Coke Making Industry
21	GEE KAY Moulds, C-32, Site A, Sikandra Ind.	Dyes and Dyes-Intermediate
	Area, Agra	
22	J.S.P. Dyes and Moulds, D-4, Foundry Nagar,	Dyes and Dyes-Intermediate
	Agra	
23	Radhika Bio-Technologies (P) Ltd	Pharmaceutical
24	Romesons Medicos, E-20, Foundry Nagar,	Pharmaceutical
	Agra	
25	Medicine Complex, 159, Ind. Estate, Nunhai,	Pharmaceutical
	Agra	
26	Agra Pharmaciticals Laboratory, 42/309 A,	Pharmaceutical
	Billochpura, Agra	
27	Vithaal Pharmacutical Pvt. Ltd., E-31, Site-C,	Pharmaceutical
	UPSIDC, Sikandra, Agra	
28	Avon Hospital, 173 B, Nehru Nagar, Bye Pass	Hospital
	Road, Agra	
29	Rainbow Hospital (Global Health Care)	Hospital
30	Futuristic Medicare (P) Ltd., Unit of Synergy	Hospital
	Plus	
31	Moolchand Medicity, 634, Artoni, Agra	Hospital
32	Rainbow Hospital (Global Rainbow Health	Hospital
	Care), Sikandra, Agra	
33	Synergy Plus Hospital, (Futuristic Medicare	Hospital
	Pvt. Ltd.), 619, Kakretha, Agra	
34	Athithi Hotel, Fatehabad Road, Agra	Hotel
35	Chambal Safari Hotel Pvt. Ltd., Jarar, Bah,	Hotel
	Agra	
36	Rajmahal Hotel (Sun Glow Hotels and Resorts	Hotel
	Pvt. Ltd.), Fatehabad, Agra	
37	Sri Tanuj Goyal & others (Hotel), 759, Basai,	Hotel
	Agra	
38	Hotel Bhawana Palace, Madiya Katra Road,	Hotel
	Agra	
39	Clarks Shiraz Hotel	Hotel
40	Crystal Sarovar Primier	Hotel

41	EIH Associated Hotels	Hotel
42	Palladium Constructions Pvt. Ltd.	Hotel
43	Sincere Developers Pvt. Ltd., Agra	Hotel
44	M/s ITC Mughal, Agra	Hotel
45	Archer Hospitality Pvt. Ltd., (Ester Hotel) B/H-	Hotel
	12, Taj Nagri, Phase II, Agra	
46	Bhawna Clarks Inn, Awas Vikas Colony Road,	Hotel
	Agra	
47	City In Private Limited	Hotel
48	Goyal International (The Oberia Amar Vilas),	Hotel
	Tajganj, Agra	
49	Hotel Atithi	Hotel
50	Hotel Ramada Plaza	Hotel
51	Shakhumbhari Adhesive Industries, E-29,30	Glue Manufacturing Industries
	Industrial Area, Sikandra, Agra	
52	Guru Laminators, F-31, Site-C, UPSIDC,	Glue Manufacturing Industries
	Sikandra, Agra	
53	Relible Tapes, 231, Artoni, Agra	Glue Manufacturing Industries
54	Shakhumbhari Adhesive Industries, E-29, 30,	Glue Manufacturing Industries
	Industrial Area, Sikandra, Agra	
55	Agra Steel Udyog, E-12, Foundry Nagar, Agra	Metal Industry
56	Akchat Metal, Gari Dariyab, Fatehabad, Agra	Metal Industry
57	Garg Steels, Shyam Nagar, Foundry Nagar,	Metal Industry
	Agra	
58	Sunil Mehta Industries, 69B, Ind. Area, Nunhai,	Metal Industry
	Agra	
59	Gyanesh Steel and Metal Products, 34/169,	Metal Industry
	Khatipara, Lohamandi, Agra	
60	Jeko Sheet Metals, 12/148, Nawalganj, Nunhai,	Metal Industry
	Agra	
61	S.R Metal Recyclers	Metal Industry
62	Steel Sheet Grob Private Limited, Village	Metal Industry
	Muzaffarpur, Fatehabad, Agra	
63	Kalyan Steel Products Pvt. Ltd., C-1, Site-B,	Metal Industry
	UPSIDC, Sikendra, Agra	
64	Metal Products, C-33, Foundry Nagar, Agra	Metal Industry

65	Aqurate Machine Tools, 38, Ind. Estate,	Metal Industry
	Nunhai, Agra	
66	Anil Metal Industries	Metal Industry
67	Metal Products, C-33, Foundry Nagar, Agra	Metal Industry
68	Ambika Sheetgrah Private Limited, Kuberpur,	Sheet Manufacturing
	Etmadpur, Agra	
69	Amar Prakash Sheetgrah Private Limited,	Sheet Manufacturing
	Khasra No.152, Village Puragna, Kirawali,	
	Agra	
70	Baba Sheetgrah Private Limited, Khasra	Sheet Manufacturing
	No.315, Mohanpur saiya Iradat Nagar, Road,	
	Agra	
71	Badri Vishal Sheetgrah Private Limited, Village	Sheet Manufacturing
	Kukbhari, Pinahat, Bah, Agra	
72	Devika Sheetgrah Private Limited, Khasra	Sheet Manufacturing
	No.613 Village Ujarai, Hathras Road, Agra	
73	Dr. Ram Sheetgrah Private Limited, Khasra	Sheet Manufacturing
	No.1320,1321, Polipokhar, Hathras Road, Agra	
74	Fatejram Sharma Sheetgrah Private Limited,	Sheet Manufacturing
	Khasra No.450, Bichaula, Fatehabad, Agra	
75	Girraj Sheetgrah Private Limited, 12	Sheet Manufacturing
	Dayanagar, Shamsabad Road, Agra	
76	Goyal Bandhu Sheetgrah Private Limited,	Sheet Manufacturing
	Khasra No.1328/2-215 Village Poiya,	
	Polipokhar, Hathras Road, Agra	
77	Javitri Devi sheetgrah Agra Pvt. Ltd.	Sheet Manufacturing
78	Jay Jainendra Sheetgrah Private Limited, Gata	Sheet Manufacturing
	No.77 Village Bhanpura, Shamsabad, Agra	
79	Kaka Ji Sheetgrah Private Limited, Jaypur high,	Sheet Manufacturing
	Agra	
80	Kansal Sheetgrah, Khasra No.1077, Village	Sheet Manufacturing
	Nandlalpur, Hathras Road, Agra	
81	Kesri Sheetgrah Private Limited, Khasra	Sheet Manufacturing
	No.562, Gadhi Mahasingh, Mitawali,	
	Etmadpur, Agra	

82	Waishas Chastoush Daireata Limited Chinaii	Chart Manufacturina
04	Krishna Sheetgrah Private Limited, Shivaji	Sheet Manufacturing
	Nagar, Krapalpura, Fatehabad, Agra	
83	Kushwah Sheetgrah Private Limited,	Sheet Manufacturing
	Fatehabad, Agra	
84	Ma Sheetla Sheetgrah Private Limited, Bas	Sheet Manufacturing
	Bosriya, Khasra No.189 Mukhvar varhan, Agra	
85	Maa Ambe Gouri Sheetgrah Private Limited,	Sheet Manufacturing
	Village Chitaura, Shamsabad, Agra	
86	Maharaja Agrasen Sheetgrah Private Limited,	Sheet Manufacturing
	635/1 Ramnagar, Khandauli, Hathras Road,	
	Agra	
87	Mani Ram Sheet Grah	Sheet Manufacturing
88	Manjula Sheetgrah, Village Nadaun, Jalesar	Sheet Manufacturing
	Road Etmadpur, Agra	
89	Mayur Sheetgrah Private Limited, Village	Sheet Manufacturing
	Sawai, Barhan Road, Etmadpur, Agra	
90	Om Jay Shiv Sheetgrah Private Limited,	Sheet Manufacturing
	Pinahat Road, Bhadrauli, Bah, Agra	
91	Om Prakash Bajnath Sheetgrah Private Limited,	Sheet Manufacturing
	Khasra No.28,202, Gata No.63,64, Luhari	
	Fatehabad, Agra	
92	Prabhat Sheetgrah, Khasra No.725, Village	Sheet Manufacturing
	Ajitgarh, Ujarai Hathras Road, Agra	
93	Radha Krishna Sheetgrah, Khasra No.598, 14	Sheet Manufacturing
	K.M. Jalesar Road, Agra	
94	Radhe-Radhe Sheetgrah Private Limited,	Sheet Manufacturing
	Village Bada Shamsabad, Agra	
95	Rama Sheesh Sheetgrah Private Limited,	Sheet Manufacturing
	Village Nehru, Post Douki, Fatehabad, Agra	
96	Ramdas Sheetgrah Private Limited, Nadau,	Sheet Manufacturing
	Jalesar Road, Agra	
97	Ramvati Sheetgrah, Poiya, Nagla Asha,	Sheet Manufacturing
	Nandlalpur, Hathras Road, Agra	
98	S.B. Sheetgrah Private Limited, Mohammadpur	Sheet Manufacturing
	Agra Mathura Road, Agra	

99	Sai Baba Sheetgrah Private Limited, Gata	Sheet Manufacturing
	No.341,342, Modipura Bhadrauli, Bah, Agra	
100	Shankuntla Sheetgrah Private Limited, Nagla	Sheet Manufacturing
	Bhusa, Hathras Road, Friganj, Agra	
101	Sheetgrah Private Limited, Saiya Kheragarh,	Sheet Manufacturing
	Agra	
102	Shivang Sheetgrah Private Limited, Nagla Asha	Sheet Manufacturing
	Nandlalpur, Hathras Road, Agra	
103	Shri Bakey Bihari Sheetgrah Private Limited,	Sheet Manufacturing
	Village Bagal Bhusa (Ajitgarh) Hathras Road,	
	Agra	
104	Shri Govind Sheetgrah Private Limited, Mahuar	Sheet Manufacturing
	Kirawali, Agra	
105	Shri Sachchidanand Sheetgrah, Gata	Sheet Manufacturing
	No.214,215, Basai, Khurda, Iradat Nagar, Agra	
106	Shri Syam ji Sheetgrah, Khasra No.641, Village	Sheet Manufacturing
	Ujrai, Hathras Road, Agra	
107	Sumit Ashish Sheetgrah	Sheet Manufacturing
108	V.K. Sheetgrah Private Limited, C-12, Faundry	Sheet Manufacturing
	Nagar, Agra	
109	Vaidh Ji Sheetgrah Private Limited, Khandauli,	Sheet Manufacturing
	Etmadpur Agra	
110	Vipin Sheetgrah Private Limited, Khasra	Sheet Manufacturing
	No.1467, Polipokhar Hathras Road, Agra	
111	Atul Sheetgrah Private Limited, Khasra No.330	Sheet Manufacturing
	and 331, Village Bhagpur, Etmadpur, Agra	
112	B.M. Lohiya Sheetgrah Private Limited, Khasra	Sheet Manufacturing
	No.705, Moja Fatehabad, Agra	
113	Chaudhri ravindra pal singh Sheetgrah Private	Sheet Manufacturing
	Limited, Gata No.936, Village Bah, Agra	
114	G.R. Sheetgrah Private Limited, 13, Vrathla	Sheet Manufacturing
	khasra No.422 and 423, Kheragarh, Agra	
115	Mahalaxmi Sheetalay Private Limited, Khasra	Sheet Manufacturing
	No.5 Gaghidaryab, Fatehabad, Agra	
125	H.M.A. Frozen Foods Export Kuberpur, Agra	Meat Processing

126	Imperial Frozen Food Product, Nagla Jaar,	Meat Processing
	Hathras Road, Agra	
127	Agra Chains, 14, Industrial Estate, Nunhai,	Electroplating
	Agra	
128	Agra Machine tools Pvt. Ltd., 132, Industrial	Electroplating
	Estate- Nunhai, Agra	
129	Atul Deepwell Hand Pumps, Atul Compund,	Electroplating
	Nunhai, Agra	
130	Anoop Chains, Vijay Nagar Colony, Agra	Electroplating
131	A. Sangeeta Chains, 37/315, Nagla Padi, Agra	Electroplating
132	A.S. Chains Industries, F-861,A/1 Tej Nagar,	Electroplating
	Kamla Nagar, Agra	
133	Benera Udyog, Bodla Road, Agra	Electroplating
134	Bharat Chain Mfg Co, 99, Industrial Estate-	Electroplating
	Nunhai, Agra	
135	Crown Chains, 147, Industrial Estate- Nunhai,	Electroplating
	Agra	
136	D.R. Chains, Takiya Lal Majshid, Agra	Electroplating
137	Gulab Chand Ameer Chand B/33, Sheetla	Electroplating
	Road, Khandari, Agra	
138	Gupta Plating Works, 8, New Adarash Nagal,	Electroplating
	Balkewshwar, Agra	
139	J.R Electroplating works(Mohammad Harun	Electroplating
	Nickle Plant) 32/197, Besan ki Basti,	
	Lohamandi, Agra	
140	Jai Durga Electroplaters (Madan Lal Agarwal	Electroplating
	Nickle Plant) 50/74, Shivdasani Nagra,	
	Sahganj, Agra	
141	Khandelwal Industrial Ent. 72-80, Industrial	Electroplating
	Estate- Nunhai, Agra	
142	Kundan Chains, Freeganj, Agra	Electroplating
143	Kush Chains, 113 Industries, Industrial Estate-	Electroplating
	Nunhai, Agra	
144	Leela corporation, 20/129, Siltanganj, Agra	Electroplating
145	M.L Chains, Nunhai Industrial Area, Agra	Electroplating

146	Mahashakti Chains 8/6A, Chanda pan vali gali,	Electroplating
	Balenganj, Agra	
147	Mohd. Waseem Electroplating Works, 32/197,	Electroplating
	Besan Ki Basti, Lohamandi, Agra	
148	Om chains, Purushotam Nagar, Randhir Nagar,	Electroplating
	Dayalbagh, Agra	
149	Pappu Chains, 7, Mugal Road, Kamla Nagar,	Electroplating
	Agra	
150	Priya chains, Industrial Estate- Nunhai, Agra	Electroplating
151	R.S. chain & company behind of Poliwal	Electroplating
	Foundary, Rambag, Agra.	
152	Radha Chains, 9-10, Industrial Estate- Nunhai,	Electroplating
	Agra	
153	Rajni Chains, 167, Industrial Estate- Nunhai,	Electroplating
	Agra	
154	Rishabh chains Zone Mill No-3, Jeoni Mandi,	Electroplating
	Agra	
155	S.K. sale cooperation 32/1/1 Takia Lal Maszid	Electroplating
	by pass road Agra	
156	S.K. Udyog, 22/2B Gangeshwar campous,	Electroplating
	Motilal Nehru road, Agra	
157	Shree Ji Chains, 114, Industrial Estate- Nunhai,	Electroplating
	Agra	
158	Shri Krishna Chains (India) Limited, 21/272,	Electroplating
	Jioni Mandi, agra	
159	Srasthi Chains, 168 B, Industrial Estate-	Electroplating
	Nunhai, Agra	
160	Suneeta Chain's, Lohia Nagar Bulkeshwar,	Electroplating
	Agra	
161	Vilash Chains, 16, Murari Vihar, Alvatia Road,	Electroplating
	Agra	
162	Agarwal Knitting Works, 138, Industrial Estate,	Textile
	Nunhai, Agra	
163	Park Leather Industries Ltd., 397, Runakta,	Tannery
	Agra	

164	J.R.R Waste Management Pvt. Ltd., Etmadpur	CBMWTF
	Agra	
165	Ambica Gen Power Pvt. Ltd., 13/22 A, Nunhai,	Gen Set
	Agra	
166	Atul Genretors Pvt. Ltd., Nunhai, Agra	Gen Set
165	Atul Pumps Pvt. Ltd.(Unit-II), Nunhai, Agra	Gen Set
166	Basant Products (India), C-46, Foundry Nagar,	Gen Set
	Agra	
167	Kesri Diesal, 25, 26, Vidhya Puram, Foundry	Gen Set
	Nagar, Agra	
168	Minerva Diesal Engine Pvt. Ltd., C-61,	Gen Set
	Foundry Nagar, Agra	
169	Mohan Generator & Pumps Pvt. Ltd., 15, Ind.	Gen Set
	Estate, Nunhai, Agra	
170	Power Field (India), E-4, Foundry Nagar, Agra	Gen Set
171	Prakesh Diesels Pvt. Ltd., 1656/16, Naraich,	Gen Set
	Hathras Road, Agra	
172	Prakesh Impex Pvt. Ltd., C-36, 37, Industrial	Gen Set
	Estate, Foundry Nagar, Agra	
173	Sri Balaji Diesals, 11/48 E, Naraich, Hathras	Gen Set
	Road, Agra	
174	Agarwal Industries, E-65, Foundry Nagar, Agra	Pesticides
175	Saraswati Chemical, F-13, UPSIDC, Site-C,	Paint
	Sikandra, Agra	
	LISTOF ORANGE INI	DUSTRY
176	Agra Rollur Flour Mills, Mathura Road, Artoni,	Baker and Confectionery Unit
	Agra	
177	Govardhan Agri Flour Mills Pvt. Ltd.,	Baker and Confectionery Unit
	Bhagupur, Gari Rami Road, Agra-283 202	
178	Mahalaxmi Prabu Prem Flour Mills, Salempur	Baker and Confectionery Unit
	Muria, Samsabad Road, Fatehbad, Agara	
179	Mahaveer Bakers, 161-E, Ind. Estate, Nunhai,	Baker and Confectionery Unit
	Agar	
180	New H.B. Biscuit Co., 170-171, Nunhai, Agra	Baker and Confectionery Unit
181	Om Bakers, 42/158, Billochpura, Agra	Baker and Confectionery Unit
182	Raipura Agro Foods Pvt. Ltd., Fatehabad	Food Processing Unit

183	Balaji Agro Food, E-14, Site-C, UPSIDC,	Food Processing Unit
	Sikandra, Agra	
184	Bansi Ram Foods	Food Processing Unit
185	Prakash Agricultural Industries, Foundry Nagar,	Food Processing Unit
	Hathras Road, Agra	
186	Imperial Frozen Food Product, Nagla Jaar,	Food Processing Unit
	Hathras Road, Agra	
187	Gowardhan Milk and Storage Private Limited,	Dairy and Dairy Products
	Fatehabad, Agra	
188	Ajanta Raj Proteins Ltd., Unit-II, Manikpura	Dairy and Dairy Products
	Bah, Agra	
189	G.K. Dairy Jarar, Bah Agra	Dairy and Dairy Products
190	Milan Dairy Products (P) Ltd. Garhi Jahan	Dairy and Dairy Products
	Singh, Shamsabad, Agra	
191	Milkam Foods Pvt. Ltd., Jarar, Bah, Agra	Dairy and Dairy Products
192	Milan Dairy Foods Pvt. Ltd.	Dairy and Dairy Products
193	Agra Dugdh Utpadak Sahkari Sangh Ltd.,	Milk Processing
	Bindu Katra, Agra	
194	Ajanta Dairy, Foundry Nagar, Agra	Milk Processing
195	Tapan Agro Industry Pvt. Ltd., Kusam Vihar,	Milk Product
	Dayalbagh, Agra	
196	Capiston Rubber Products, T.P. Nagar, Agra	Rubber Industry
197	Capstan Rubbers (India), C-6, Site-A, UPSIDC,	Rubber Industry
	Sikandra, Agra	
198	Capstan Rubbers (India), UNIT-II C-2, Site-A,	Rubber Industry
	UPSIDC, Sikandra, Agra	
199	Capstan Rubbers (India), UNIT-III C-1, Site-A,	Rubber Industry
	UPSIDC, Sikandra, Agra	
200	J.J Rubber and Plastic, 117, Ind. Estate, Nunhai,	Rubber Industry
	Agra	
201	Madal Rubber Industries, 105, Ind. Estate,	Rubber Industry
	Nunhai, Agra	
202	Novelty Metal & Rubber Industries	Rubber Industry
203	Sandeep Rubber Industries, 3-4, Bhagwati	Rubber Industry
	Vihar, Bichpuri Road, Agra	

204	Santosh Rubber Industries, 127, Ind. Estate,	Rubber Industry
	Nunhai, Agra	·
205	Shakti Rubber Corporation, 9 th Km. Mathura	Rubber Industry
	Road	,
206	Taneja Rubber Udyog, 161, 161A, Ind. Estate,	Rubber Industry
	Nunhai, Agra	Trace of mounty
207	Weston Rubber Industries, 11 km, Mathura	Rubber Industry
207	Road, Agra	Rubbel industry
208	Vigroa Medicare and Resurch Pvt. Ltd., (V.S.	Ayurvedic Medicine
200	Datta Manufactures), 9/149, Moti Bagh,	Tryal vedic Medicine
	Yamuna Bridge, Agra	
209	Agra Loh Udyog, 1167, Foundary Nagar, Agra	Casting
210	A.B. Auto Works (P) Ltd., C-32, Foundry	Casting
210	Nagar, Agra	Casting
211		Casting
211	A.K. Enterprises, B-20/1-A, Foundry Nagar,	Casting
212	Ay Valent Ltd. 160 Ltd Feter North	Continu
212	A.V. Volves Ltd., 160, Ind. Estate, Nunhai,	Casting
212	Agra	
213	Agarwal Engineering Works, 7, Sharda End.	Casting
	Estate, Nunhai, Agra	
214	Agarwal Iron Works (Foundry Unit), 12/5A-2,	Casting
	Nunhai, Agra	
215	Agarwal Metal Industries, C-70 Foundry Nagar,	Casting
	Agra	
216	Agra Industrial Corporation, 12/128 D, Nagla	Casting
	Balchand, Nunhai, Agra	
217	Agra Machine Tools Pvt. Ltd., Unit-2, Nunhai,	Casting
	Agra	
218	Agra Metal Perfortes (India), 14, Sharda Ind.	Casting
	Estate, Nunhai, Agra	
219	Agra Steel Udyog, E-12, Foundry Nagar, Agra	Casting
220	Ajanta Industries, D-20, Industrial Area,	Casting
	Foundry Nagar, Agra	
221	Alfa Engineering Works, 20, I.E. Nunhai, Agra	Casting
222	Amar Enterprises, Plot no-2, Ind. Estate,	Casting
	Nunhai, Agra	

223	Amar Joyti Industries, Artoni, Mtr Road, Agra	Casting
224	Ambica Engineers, 158, Ind. Area, Nunhai,	Casting
	Agra	
225	Aqurate Feroo Casting, Nunhai, Agra	Casting
226	Arberia Alloya Casting, B-15/2, Foundry	Casting
	Nagar, Agra	
227	Ashok Metal Works, 13 A/822 B, Sahadra,	Casting
	Nunhai Road, Agra	
228	Atul Engineering Udyog, Nunhai, Agra	Casting
229	Automotive Products Co., 73, Ind. Estate,	Casting
	Nunhai, Agra	
230	B.K. Castings, C-6, Industrial Estate, Foundry	Casting
	Nagar, Agra	
231	B.R. Enterprises, E-39, 40, Foundry Nagar,	Casting
	Agra	
232	B.S. Agriculture Ind. (India), 12/15 A,	Casting
	Nawalganj, Nunhai, Agra	
233	Bajrang Iron Foundry, B-4, Industrial Estate,	Casting
	Foundry Nagar, Agra	
234	Bajrang Udyog, E-27, Foundry Nagar, Agra	Casting
235	Balkeshwarnath Industries, Shyam Nagar,	Casting
	Hathras Road, Agra	
236	Bankey Bihari Udyog, 10/9B, Katra Bazir	Casting
	Khan, Agra	
237	Bharat Industries, B-12, Foundry Nagar, Agra	Casting
238	Bharat Iron and Steel Foundry, 10/10, Katra	Casting
	Wajir Khan, Agra	
239	Bombay Engineering & Moulding Works Pvt.	Casting
	Ltd, 3994, Nagla Kishan Lal, Hathras Road,	
	Agra	
240	Brajesh and Brothers, 130, Industrial Estate,	Casting
	Nunhai, Agra	
241	Brij Iron Industries 13/22C, Shahdara Road,	Casting
	Nunhai. Agra	
242	Britaniya Engineering Co., C-31, Foundry	Casting
	Nagar	

243	Cast Well Foundry, 11B/101, Naraich Hathras	Casting
	Road, Agra	
244	Chinaar Foundry, E-12, Foundry Nagar, Agra	Casting
245	Deewan Chand Suraj prakesh Jain, 11/43,	Casting
	Rambagh Hathras Road, Agra	
246	Devi Enterprises, 2918, Naraich, Hathras Road	Casting
247	Devi Sahai Gopal Das, C-15, Foundry Nagar,	Casting
	Agra	
248	Doneria Engineering Co., 10/4, Hathras Road,	Casting
	Agra	
249	Doneria Pvt. Ltd., 10/4, Hathras Road, Agra	Casting
250	Dular Steel Products, 116, Ind. Estate, Nunhai,	Casting
	Agra	
251	Expert Founders, & Engg., E-29, Industrial	Casting
	Estate, Foundry Nagar, Agra	
252	Farmar Ind C-63, Foundry Nagar, Agra	Casting
253	G.M. Industrial Corpo., E-70, Industrial Estate,	Casting
	Foundry Nagar, Agra	
254	G.T. Iron Foundry, 11/38, A-3, Sita Nagar,	Casting
	Agra	
255	Ganga Engineers, Unit I, 11/48, Rambagh, Agra	Casting
256	Garg Steels, Shyam Nagar, Foundry Nagar,	Casting
	Agra	
257	Glorious Enterprises, Foundry Nagar, Agra	Casting
258	Golden Ind. Corporation, 11/45, Rambagh,	Casting
	Agra	
259	Gopal Iron Foundry, D-43, Foundry Nagar	Casting
260	Goyal Iron and Steel Works, Foundry Nagar,	Casting
	Agra	
261	Goyal Metal Industries, 11/48G, Hathras Road,	Casting
	Naraich, Agra	
262	Accrate Ferro Casting, B-18/1, Industrial	Casting
	Estate, Foundry Nagar, Agra	
263	Meeraj Iron Foundry	Casting
264	Sikoo Interlining, E-79, Site C, Ind. Estate,	Cotton Industry
	Sikandra, Agra	

265	GAIL India Ltd., Teri Bagiya, Hathras Road,	Gas Industry
	Agra	
266	Sahaj Cerchem Pvt. Ltd., 55, Industrial Estate,	Ceramic
	Nunhai, Agra	
267	Sahaj Cerchem Pvt. Ltd., 75, Industrial Estate,	Ceramic
	Nunhai, Agra	
268	Indian Ceremic House, 31/401, Langrey Ki	Ceramic
	Chowki, Agra	
269	ABC Beverages Pvt. Ltd., E-67, Site-C,	Coke Making Industry
	UPSIDC, Sikandra, Agra	
270	ARVC Sons Beverages and Food Pvt. Ltd.,	Coke Making Industry
	914/1, Nagla Laldas, Kirauli Road, Runakta,	
	Agra	
271	Balaji Beverages, E-35, Site C, Sikandra, Agra	Coke Making Industry
272	Care Food & Beverages, Agra	Coke Making Industry
273	Bright Engineering Works, E-19, Foundry	Diesel Engine
	Nagar, Agra	
274	Om Marketing Corporation, 15, Sahadra Ind.	Diesel Engine
	Estate, Nunhai, Agra	
275	Savitri Engineering Industries, 10/4 A,	Diesel Engine
	Nawalganj, Agra	
276	Benara Auto Pvt Ltd., Artoni, Agra	Engineering
277	Benara Automotives Pvt. Ltd., Artoni, Agra	Engineering
278	Benara Bearing and Piston Ltd., A-3,4, Site-B,	Engineering
	UPSIDC, Sikandra Ind. Estate, Agra	
279	Benara Engine Spares Pvt. Ltd., Artoni, Agra	Engineering
280	Benara Metrab Ltd., Artoni, Agra	Engineering
281	Benara Udyog Ltd., Unit II, Artoni, Runakta,	Engineering
	Agra	
282	Sheela Udyog Ltd., Unit II, Artoni, Runakta,	Engineering
	Agra	
283	Suman Engineering Works, 151, Ind. Estate,	Engineering
	Nunhai, Agra	
284	Trafo Power & Electricals Pvt. Ltd	Engineering
285	Jagdamba Engineering Works, 15 A, Sharda	Engineering
	Ind. Estate, Nunhai, Agra	

286	Doneria Engineering Co., 10/4, Hathras Road,	Engineering
	Agra	
287	Benara Volves Ltd., Artoni, Agra	Engineering
288	K.I.E Engineering Pvt. Ltd, 74B, Industrial Estate, Nunhai, Agra	Engineering
289	Anand Enterprises, C-56, Foundry Nagar, Agra	Machining
290	Aqurate Machine Tools, 38, Ind. Estate,	Machining
	Nunhai, Agra	
291	Jeko Sheet Metals, 12/148, Nawalganj, Nunhai,	Machining
	Agra	
292	Krishna Engineering Works, 25, Shardha Ind.	Machining
	Estate, Agra	
293	Laxmi Sales Corporation, 3996, 4031, Infron of	Machining
	SBI, Foundry Nagar, Agra	
294	Modern Dieseals India, 11/47, Rambagh,	Machining
	Hathras Road, Agra	
295	MotiKant Enterprises, 22, Sulekha Estate,	Machining
	Pilakhaar, Nunhai, Sahadra Road, Agra	
296	National Industries, 48C, Ind. Estate, Nunhai,	Machining
	Agra	
297	Nav Bharat Industries, B-25, Foundry Nagar,	Machining
	Agra	
298	O.P. Associates & Engineers, 44B, Pilakhar,	Machining
	Sahadra Road, Nunhai, Agra	
299	Perfect Engineers, 23 A, Sahadra Ind. Area,	Machining
	Nunhai, Agra	
300	Perfect Engineers, 23 A, Sahadra Ind. Area,	Machining
	Nunhai, Agra	
301	Prakesh Wire Industries, 37/135A, Haweli	Machining
	Alam Khan, Syad Para, Lohamandi, Agra	
302	Prem Industrial Corporation, 10/2A, Moti Bagh,	Machining
	Hathras Road, Agra	
303	Presto Products, 10, Ind. Estate, Nunhai, Agra	Machining
304	S. Garg Industries, Foundry Nagar, Hathras	Machining
	Road, Agra	
305	Shiv Pumps, D-1/A, Foundry Nagar, Agra	Machining

306	Steelco Industries, 54, Ind. Estate, Nunhai,	Machining
	Agra	
307	Vaani Industries, kg-61, Foundry Nagar, Agra	Machining
308	Vishal Engineering Corpo., 45, Ind. Estate,	Machining
	Agra	
309	Amba Associates, E-121, Site-C, UPSIDC,	Printing Press
	Sikandra, Agra	
310	Amar Ujala Publication Ltd., Sikandra, Agra	Printing Press
311	Agarwal Publications, (Printing Unit) F-8,	Printing Press
	UPSIDC, Sikandra, Agra	
312	Jagran Prakashan Pvt. Ltd., B-1, Site-A,	Printing Press
	UPSIDC, Sikandra, Agra	
313	Anurag Enterprises, E-50, 51, Foundry Nagar,	Printing Press
	Agra	
314	Agra Pulp and Papers, Near D-3, Foundry	Printing Press
	Nagar	
315	Hindustan Media Ventures Ltd., Artoni,	Printing Press
	Mathura Road, Agra	
316	Paper and Boards Converters, E-73, 74,	Printing Press
	Foundry Nagar, Agra	
317	Sahitya Bhawan Publication, C-27, Site-C,	Printing Press
	Sikandra, Agra	
318	P.L. Colour Lab. 3/12, Pratap Pura, Agra	Printing Press
319	ICES Products (Adivision of Mahim Patran	Ice Candy
	Pvt), Sikandra, Agra	
320	Romsons Juniors India (Unit_II), C-1, Foundry	Surgical Product
	Nagar, Agra	
321	Raj Vijya Corporation, (Unit-I)102, Ind. Estate,	Surgical Product
	Nunhai, Agra	
322	Raj Vijya Corporation, (Unit-II) E-6, Foundry	Surgical Product
	Nagar, Agra	
323	Agarwal Wire Industries, C-30, Site C,	Wire Making
	Sikandra, Agra	
324	Gyanesh Steel and Metal Products, 34/169,	Wire Making
	Khatipara, Lohamandi, Agra	
325	Uper India Cable, 9/271, Moti Katra, Agra	Wire Making

326	Mahesh Chandra Agarwal and Co., C-9, Site-C,	Wire Making
	Sikandra, Agra	
327	Narain Brothers, E-23, Foundry Nagar, Agra	Wire Making
328	ACPL Finding Pvt. Ltd., 47, Ind. Estate,	Metal Chain
	Nunhai	
329	Agra Ispat Udyog 15th KM Stone, Artoni,	Metal Scrape
	Mathura Road, Agra	
330	Kotsons Pvt Ltd., C-21, UPSIDC, Sikendra,	Transformer
	Agra	
331	Kotsons Pvt Ltd.,B-50, 51,EPIP, Shastripurm,,	Transformer
	Agra	
332	Marsons Electrical Industries, Artoni, Mathura	Transformer
	Road, Agra	
333	Rajasthan Transformors and Switch Gaires, (A	Transformer
	unit - RTC Power Corpo. Ltd.), Mathura Road	
334	Tefco Power and Electricals Pvt. Ltd., C-20,	Transformer
	Site-C, UPSIDC, Sikandra, Agra	
345	Hindustan Oil & Chemicals, KH-30, Sheetal	Oil Packaging
	Vihar Colony, Mouja Bholai, Mohammadpur,	
	Etmadpur, Agra	
346	Indian Oil Corporation Ltd., (Marketing Div.),	Oil Packaging
	Etmadpur, Agra	
347	Indian Oil Corporation Ltd., Pipeline I, Mathura	Oil Packaging
	Tundla Pile line, Etmadpur, Agra	
348	Indian Oil Corporation, Air Force Station,	Oil Packaging
	Kheria, Agra	
349	K.N. Metal Suppliers, 9/270-71, Moti Katra,	Scrap Trading
	Agra	
350	Prakesh Metal House, 29/223,224, Alamganj,	Scrap Trading
	Karwan, Lohamandi, Agra	
351	Redson India,184/1, Khaaspur, Girrajji Dham,	Scrap Trading
	Agra	
352	S.M. Enterprises, 77, Ind. Area, Nunhai, Agra	Scrap Trading
353	S.R. Metal Recyclers, 21, Kasra No. 1190,	Scrap Trading
	Chandan Nagar, Baipur, Byepass, Agra	

354	S.R. Metcast India Pvt. Ltd., 11.8, Mathura	Scrap Trading
	Road, Agra	
355	Sri Mahaveer Jee Trading Co., 30/127,	Scrap Trading
	Chipitola, Agra	
356	Sunil Metal Industries, 69 B, Ind. Area, Nunhai,	Scrap Trading
	Agra	
357	Hindustan Cruser and Fertilizers Co., Mathura	Fertilizers
	Road, Runakta, Agra	
358	Paper and Boards Converters, E-73, 74,	Paper Products
	Foundry Nagar, Agra	
359	Agra Pulp and Papers, Near D-3, Foundry	Handmade Paper
	Nagar	
360	Plywood Products, Mathura Road, Runakta,	Ply-board Manufacturing
	Agra	
361	MPL Advance Healthcare System Pvt. Ltd., E-	PVC Pipe
	60, Site C, Sikandra, Agra	
362	Krishna Polymer, E-92, Site-C, UPSIDC,	PVC Pipe
	Sikandra, Agra	
363	Subhash Polymers, E-59, Foundry Nagar, Agra	PVC Pipe
364	Suresh Polymers, E-57, 58, Foundry Nagar,	PVC Pipe
	Agra	
365	Chandra Radiator, B-17/5, Foundry Nagar,	Radiator
	Agra	
366	K.B. Enterprises, 81/1, Ind. Estate, Nunhai,	Radiator
	Agra	
367	Chandra Radiators, B-17/5, Foundry Nagar,	Radiator
	Agra	
368	Bajwa Rubber Industries, Unit-II, C-8, Site-A,	Rubber Sheet
	UPSIDC, Sikandra, Agra	
369	Katyaal Industries, 10 Km. Mathura Road, Agra	Rubber Sheet
370	Sunrise Rubber Industries, 160 A, Ind, Estate,	Rubber Sheet
	Nunhai, Agra	
371	AARKAY Associate, B-7, EPIP, UPSIDC,	Bulb Filament
	Shastripuram, Agra	
372	Anjani Enterprise, B-7, EPIP, UPSIDC,	Agricultural Equipment
	Shastripuram, Agra	

373	Chandra Agricultural Industry, C-61/2, Foundry	Agricultural Equipment
	Nagar, Agra	
374	Krishi Seva Udyog, D-41, Foundry Nagar, Agra	Agricultural Equipment
375	Vijaya Industries, B-25, Foundry Nagar, Agra	Agricultural Equipment
376	Babita Agriculture & Plastic Udyog, 1585,	Agricultural Equipment
	Opp. Bhatia Pertol Pump, Hathras Road,	
	Naraich, Agra	
377	OMEX SRK Mall, Bye Pass Road, Agra	Mall
378	Swami Build Tech Pvt. Ltd., (TDI Mall), 3D,	Mall
	Taj Nagri Phase – 1, Fatehabad Road, Agra	
379	Confidence Patrolium India Ltd., 215-216,	Bottling Plant
	Purgana, Kirwali, Agra	
380	Rangji Build Well Pvt. Ltd., 210, Gailana, Agra	Building
381	M.G. Contractors Pvt. Ltd., Nagla Rambakash,	Building
	Nawalpur, Etmadpur, Agra	
382	Oil and Chamical Composition 110 111 Ind	Calcium Strate
364	Oil and Chemical Corporation, 110, 111, Ind.	Calcium Strate
202	Estate, Nunhai, Agra	Communication Professional Profession Profes
383	Metalco Sales, Shyam Nagar, Hathras Road,	Conware Belt
384	Agra Tata Project Ltd. Ranpai, Etmadpur, Agra	Conido on Duois at
		Coridoor Project Green Gas
385	Gail India Ltd., Teri Bagiya, Hathras Road,	Green Gas
207	Agra	Court Court
386	Standard Pumps, 12/149, Nawalganj, Nunhai,	Green Gas
207	Agra Cross Cos Ltd. (CNC Mathew Station)	Caraca Cara
387	Green Gas Ltd., (CNG-Mother Station)	Green Gas
200	Transport Nagar, Agra	Construction
388	Green Gas Ltd., (CNG-Mother Station), Sector-	Green Gas
200	B1, Taj Nagri Phase - 2, Agra	DMC
389	M.G. Contractors Pvt. Ltd., Nagla Rambakash, Nawalpur, Etmadpur, Agra	RMC
200		DMC
390	Mehrotra Buildcon Pvt. Ltd., 162, Baroli Aheer,	RMC
201	Doki, Sadar, Agra	DMC
391	PNC Infratech Ltd., 454, Sikrara, Fatehabad	RMC
392	S.P. Singhla Constructions Pvt. Ltd., Luhari,	RMC
	Fatehabad, Agra	

393	Techno Easy crete Pvt. Ltd., 633, Gram Sabai,	RMC
	Etmadpur, Agra	
394	Vacmet Packaging Pvt. Ltd., B-5, Site A, Ind.	Packaging Material
	Estate, Sikandra, Agra	
395	Suman Industries, 151, Industrial Estate,	Packaging Material
	Nunhai, Agra	
396	Taj Velvet and Silk Mills, 61, Ind. Estate,	Velvet
	Nunhai	
397	Dolphin Water Park, Mathura Road, Runkta,	Water Park
	Agra	
398	Om Spare Parts Pvt. Ltd., 7, Sahadra Road,	Spare Parts
	Nunhai, Agra	
399	J-SIL Scientific Industries, 48/B, Ind. Estate,	Glass Industry
	Nunhai, (2760, Link Road), Agra	
400	KTL Pvt. Ltd., 35/43 E, Mughal Road, Kamla	Service Center
	Nagar, Agra	
401	Sleen Overseas, 295, Kuberpur, Agra	Testing Lab
402	Jaipuria Sunrise Green, Barauli Aheer, Agra	Township
403	Best Price Modern Wholesale(Wal-Mart	Ware House
	Pvt.Ltd.) Khasra No. 814/2, 815, 816, 817/2,	
	Vill Chalesar, Etmadpur, Agra	
404	P & J Aoremetics, Geeta Nagar, Balkeshwar,	Gutkha
	Agra	
405	Kramanka Packing Systems Pvt. Ltd., D-44,	Laminator
	Site_C, UPSIDC, Sikandra, Agra	
406	Guru Laminators, F-31, Site-C, UPSIDC,	Laminator
	Sikandra, Agra	
407	Idea Cellular Limited	Mobile Tower
408	Mittal Chemical Industries, E-47, Foundry	Phenol
	Nagar, Agra	
409	Touraids (I) Travel Service, VIP Road, Basai,	Sale of Petrol
	Agra	
410	Balkeshwar Silicate Works, B-2/A-3, Foundry	Silicate
	Nagar, Agra	
	LIST OF GREEN IND	USTRIES

411	Adees Exports, 15/3, 15/4, SITE-C, UPSIDC,	Export
	Sikandra, Agra	
412	Amit Exports, A-10, EPIP, Shastripuram, Agra	Export
413	Hits Exports, 1/87, Panchkuiyan, Agra	Export
414	HMA Leather Export Pvt. Ltd., 652G/386,	Export
	Mauza Chalesar, Etmadpur, Agra	
415	Jas Exports, 34/2, Lakhanpur, Near Hundai	Export
	Showroo, Delhi Highway, Agra	
416	Jindal Exports, E-32, Foundry Nagar Agra	Export
417	Om Exports, (Unit-I), 160/2, Maghtai, Bichpuri	Export
	Road, Agra	
418	Om Exports, D-2, EPIP, Sastripurm, Agra	Export
419	Park Exports, 42/141, Billochpura, Mathura	Export
	Road, Agra	
420	VRD Exports, A-6, EPIP, Shstripurm, Sikandra,	Export
	Agra	2
421	A.T. Exports, Bichpuri Road, Agra	Export
422	Agra Rollur Flour Mills, Mathura Road, Artoni,	Flour Mill
	Agra	
423	Govardhan Agri Flour Mills Pvt. Ltd.,	Flour Mill
	Bhagupur, Gari Rami Road, Agra - 283 202	
424	Mahalaxmi Prabu Prem Flour Mills, Salempur	Flour Mill
	Muria, Samsabad Road, Fatehabad, Agra	
425	Aravali Fly Ash Brick Co., 31/409, Nagla	Fly Ash Brick
	chidda, Etmadpur, Agra	
426	A.R. Shoe Factory, Artoni	Footwear Industry
427	AAR KAY Footwear, Kh. No. 1410, Bainpur,	Footwear Industry
	Agra Mathura Road, Agra	
428	Amar Shoe and Leather Wears, 646, Artoni	Footwear Industry
429	Ashoka Boot Factory, Khasra No. 13, Kalwari,	Footwear Industry
	Bichpuri Road, Agra	
430	Atlex Juta Facatory, Minakshi Place,	Footwear Industry
	Lohamandi, Agra	
431	Combote Boot Co., D-12, site C, UPSIDC,	Footwear Industry
	Sikandra, Agra	

432	D.B. Footwear, 35/43 A, Laskar pur, Kamla	Footwear Industry
	Nagar, Agra	
433	Dabar Footwears Industries, Agra Mathura	Footwear Industry
	Road, Sikandra, Agra	
434	Dabar Footwears Industries,(unit-3), 56B-57,	Footwear Industry
	EPIP, Shastripurm, Agra	
435	Euro Safty Footwear (India) Pvt. Ltd, Agra	Footwear Industry
436	Foot Care Camponents, E-109, Site_C,	Footwear Industry
	UPSIDC, Sikandra, Agra	
437	Foot on Shoes, Kakretha, Mathura Road, Agra	Footwear Industry
438	Foot Style, 59-60, Rajeev Nagar, Sitla Road,	Footwear Industry
	Agra	
439	Footwear INC, C-19,/3, Site A, UPSIDC,	Footwear Industry
	Sikandra, Agra	
440	Global Footwear, A 5/1, 5/2, B 7/1, 7/2, 7/3,	Footwear Industry
	EPIP, Sashtripuram, Agra	
441	J.M. Footwear Pvt. Ltd., C-39, Site C, Sikandra	Footwear Industry
442	Jordan Shoe Factory, 9, Mini Gulmohar	Footwear Industry
	Enclave, Shaheed Nagar, Agra	
443	Kelboo Shop Company, C-37, UPSIDC,	Footwear Industry
	Sikandra, Agra	
444	Lamba Footwear Industry, 238, 239, Artoni	Footwear Industry
445	Leather Linkers Footwear Pvt. Ltd., D-30-31,	Footwear Industry
	UPSIDC, Sikandra, Agra	
446	Lenier Shoes Private Limited	Footwear Industry
447	Liner Shoes Pvt. Ltd., A- 7, 8, 9 EPIP,	Footwear Industry
	Shastripurm, Agra	
448	Megnum Footwear Pvt. Ltd., 11 Km, Mathura	Footwear Industry
	Road, Agra	
449	New Advance Shoe Factory, 15, Kailesh	Footwear Industry
	Mandir Road, Sikandra, Agra	
450	New India Boot Factory, 11/137, Near Sobia	Footwear Industry
	College Building, Calactorate, Agra	
451	North India Boot Factory, 1/132/1, Sayid Ali	Footwear Industry
	Nabi, Shahaganj Road, Agra	
452	Nova Shoes, 432, Gailana, Agra	Footwear Industry

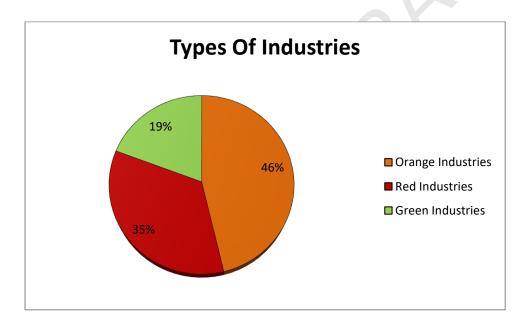
Sikandra, Agra 454 Rajeev Shoe Factory, E-37, Site C, UPSIDC, Sikandra, Agra 455 Siddhi Vinyak Shoe CO., 50/75, Shiv Dashani Footwear Industry	
Sikandra, Agra 455 Siddhi Vinyak Shoe CO., 50/75, Shiv Dashani Footwear Industry	
455 Siddhi Vinyak Shoe CO., 50/75, Shiv Dashani Footwear Industry	
N GI I 'A	
Nagar, Shahaganj, Agra	
456 Swastic Boot Factory, 50/75, Rajeev Cinema, Footwear Industry	
Sahaganj, Agra	
457 Tej Shoe Tech., 10/11, Artoni, MTR Road, Footwear Industry	
Agra	
458 Trans World Shoe Pvt. Ltd., 3/13/3, 3/20/3, Sita Footwear Industry	
Kunj, Behind Civil Court, Agra	
459 Trans World Shoe Pvt. Ltd., Artoni, Agra Footwear Industry	
460 Treila Footwear Exports Pvt. Ltd., D-38, Site- Footwear Industry	
C, Ind. Estate, Sikandra, Agra	
461 Uday Shoe, Pvt. Ltd., E-83, Site-C, UPSIDC, Footwear Industry	
Sikandra, Agra	
462 Uro Safety Footwear (India) Pvt. Ltd., EPIP, Footwear Industry	
Sastri Puram, Agra	
463 Vishukarma Shoe Las and Asossories, D-28, Footwear Industry	
Site-C, UPSIDC, Sikandra, Agra	
464 DSM Sole Products Pvt. Ltd., E-91, Site-C, Footwear Industry	
UPSIDC, Sikandra, Agra	
465 Bandejjia Traders, Near Sherjang Dargah, Traders	
Mathura Road, Agra	
466 Basant Overseas, NH-2, Bye Pass Road, Agra Traders	
467 Deepika Traders, F-17, Site-C, UPSIDC, Traders	
Sikandra, Agra	
468 Gupta H. Overseas (India) Pvt. Ltd., Unit-I, Traders	
425, Near Tubewell Colony, Bye Pass Road,	
Agra	
469 Gupta H.C. Overseas (India) Pvt. Ltd., Unit-II, Traders	
C-11, EPIP, Sastripuram, Agra	
470 Jatin Overseas, D-10, Site-C, UPSIDC, Traders	
Sikandra, Agra	

Sastipuram, Agra 472 Oswal Traders and Trevals Pvt. Ltd., 1667, Vill. Basai, Fetchabad Road, Agra 473 Overseas Trade Linker's 474 R.N. Bajaj Overseas, 589 A, Artoni, Mathura Road, Agra 475 R.S.V Worldwide 476 RSV World Wide, B-2, Site A, UPSIDC, Sikandra, Agra 477 Treila Overseas Pvt. Ltd., D-1, EPIP, Sastripuram, Sikandra, Agra 478 U. V. Overseas, 1082, Baipur, Agra 479 Young Style Overseas, 191-192, Bichpuri Road, Maghtai, Agra 480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra 486 Silent Leather Works, Vill. Pathauli, Leather Industry	471	Neelson Overseas, C-34 to 38, C-64-65, EPIP,	Traders
Basai, Fetehabad Road, Agra 473 Overseas Trade Linker's Traders 474 R.N. Bajaj Overseas, 589 A, Artoni, Mathura Road, Agra 475 R.S.V Worldwide Traders 476 RSV World Wide, B-2, Site A, UPSIDC, Sikandra, Agra 477 Treila Overseas Pvt. Ltd., D-1, EPIP, Traders 478 U. V. Overseas, 1082, Baipur, Agra Traders 479 Young Style Overseas, 191-192, Bichpuri Road, Maghtai, Agra 480 Premicar Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra Plastic Manufacturing 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra		Sastipuram, Agra	
473 Overseas Trade Linker's 474 R.N. Bajaj Overseas, 589 A, Artoni, Mathura Road, Agra 475 R.S.V Worldwide 476 RSV World Wide, B-2, Site A, UPSIDC, Sikandra, Agra 477 Treila Overseas Pvt. Ltd., D-1, EPIP, Sastripuram, Sikandra, Agra 478 U. V. Overseas, 1082, Baipur, Agra 479 Young Style Overseas, 191-192, Bichpuri Road, Maghtai, Agra 480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra	472	Oswal Traders and Trevals Pvt. Ltd., 1667, Vill.	Traders
474 R.N. Bajaj Overseas, 589 A, Artoni, Mathura Road, Agra 475 R.S.V Worldwide 476 RSV World Wide, B-2, Site A, UPSIDC, Sikandra, Agra 477 Treila Overseas Pvt. Ltd., D-1, EPIP, Sastripuram, Sikandra, Agra 478 U. V. Overseas, 1082, Baipur, Agra 479 Young Style Overseas, 191-192, Bichpuri Road, Maghtai, Agra 480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra		Basai, Fetehabad Road, Agra	
Road, Agra 475 R.S.V Worldwide 476 RSV World Wide, B-2, Site A, UPSIDC, Sikandra, Agra 477 Treila Overseas Pvt. Ltd., D-1, EPIP, Sastripuram, Sikandra, Agra 478 U. V. Overseas, 1082, Baipur, Agra 479 Young Style Overseas, 191-192, Bichpuri Road, Maghtai, Agra 480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra	473	Overseas Trade Linker's	Traders
475 R.S.V Worldwide Traders 476 RSV World Wide, B-2, Site A, UPSIDC, Sikandra, Agra 477 Treila Overseas Pvt. Ltd., D-1, EPIP, Sastripuram, Sikandra, Agra 478 U. V. Overseas, 1082, Baipur, Agra 479 Young Style Overseas, 191-192, Bichpuri Road, Maghtai, Agra 480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra	474	R.N. Bajaj Overseas, 589 A, Artoni, Mathura	Traders
476 RSV World Wide, B-2, Site A, UPSIDC, Sikandra, Agra 477 Treila Overseas Pvt. Ltd., D-1, EPIP, Sastripuram, Sikandra, Agra 478 U. V. Overseas, 1082, Baipur, Agra 479 Young Style Overseas, 191-192, Bichpuri Road, Maghtai, Agra 480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra		Road, Agra	
Sikandra, Agra 477 Treila Overseas Pvt. Ltd., D-1, EPIP, Sastripuram, Sikandra, Agra 478 U. V. Overseas, 1082, Baipur, Agra 479 Young Style Overseas, 191-192, Bichpuri Road, Maghtai, Agra 480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra	475	R.S.V Worldwide	Traders
477 Treila Overseas Pvt. Ltd., D-1, EPIP, Sastripuram, Sikandra, Agra 478 U. V. Overseas, 1082, Baipur, Agra 479 Young Style Overseas, 191-192, Bichpuri Road, Maghtai, Agra 480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra	476	RSV World Wide, B-2, Site A, UPSIDC,	Traders
478 U. V. Overseas, 1082, Baipur, Agra Traders 479 Young Style Overseas, 191-192, Bichpuri Traders 480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Plastic Manufacturing 5ikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra Plastic Manufacturing 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Plastic Manufacturing 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra		Sikandra, Agra	
 478 U. V. Overseas, 1082, Baipur, Agra 479 Young Style Overseas, 191-192, Bichpuri Road, Maghtai, Agra 480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra 	477	Treila Overseas Pvt. Ltd., D-1, EPIP,	Traders
479 Young Style Overseas, 191-192, Bichpuri Road, Maghtai, Agra 480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra		Sastripuram, Sikandra, Agra	
Road, Maghtai, Agra 480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra	478	U. V. Overseas, 1082, Baipur, Agra	Traders
480 Premiear Plastic, C-32, Site-C, UPSIDC, Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra	479	Young Style Overseas, 191-192, Bichpuri	Traders
Sikandra, Agra 481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra		Road, Maghtai, Agra	
481 Radhey Plastic, E-119, Site-C, UPSIDC, Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra	480	Premiear Plastic, C-32, Site-C, UPSIDC,	Plastic Manufacturing
Sikandra, Agra 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra Plastic Manufacturing 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Plastic Manufacturing Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Plastic Manufacturing Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Leather Industry Ki Mandi, Agra		Sikandra, Agra	
 482 Sri Ram Plastic, C-57, Foundry Nagar, Agra Plastic Manufacturing 483 Star Plast Enterprises, F-32, Site-C, Sikandra, Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Leather Industry Ki Mandi, Agra 	481	Radhey Plastic, E-119, Site-C, UPSIDC,	Plastic Manufacturing
483 Star Plast Enterprises, F-32, Site-C, Sikandra, Plastic Manufacturing 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Plastic Manufacturing 588 Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Leather Industry Ki Mandi, Agra		Sikandra, Agra	
Agra 484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra Leather Industry	482	Sri Ram Plastic, C-57, Foundry Nagar, Agra	Plastic Manufacturing
484 JMD Plastic, D-19/2, Site-C, UPSIDC, Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Ki Mandi, Agra Leather Industry	483	Star Plast Enterprises, F-32, Site-C, Sikandra,	Plastic Manufacturing
Sikandra, Agra 485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Leather Industry Ki Mandi, Agra		Agra	
485 Shafeek Leather Works, 5/30, Nehra Gali, Nai Leather Industry Ki Mandi, Agra	484	JMD Plastic, D-19/2, Site-C, UPSIDC,	Plastic Manufacturing
Ki Mandi, Agra		Sikandra, Agra	
	485	Shafeek Leather Works, 5/30, Nehra Gali, Nai	Leather Industry
486 Silent Leather Works, Vill. Pathauli, Leather Industry		Ki Mandi, Agra	
	486	Silent Leather Works, Vill. Pathauli,	Leather Industry
Fathpursikri Road, Agra		Fathpursikri Road, Agra	
487 J.S. Plastic and Leather Wear, D-3, Foundry Leather Industry	487	J.S. Plastic and Leather Wear, D-3, Foundry	Leather Industry
Nagar, Agra		Nagar, Agra	
488 Ashija Industries, Mathura Road, Agra Leather Board	488	Ashija Industries, Mathura Road, Agra	Leather Board
489 Stonemen Crarfts (I) Pvt. Ltd., A-21, 22, EPIP, Handicraft	489	Stonemen Crarfts (I) Pvt. Ltd., A-21, 22, EPIP,	Handicraft
Shastripurm		Shastripurm	
490 Stonemen Crarfts India Pvt. Ltd., (unit-II) B-2, Handicraft	490	Stonemen Crarfts India Pvt. Ltd., (unit-II) B-2,	Handicraft
EPIP, Shastripurm		EPIP, Shastripurm	

491	Stonemen Crarfts India Pvt. Ltd., (unit-III) C-	Handicraft
	128-C-130, EPIP, Shastripurm	
492	Stonemen Crarfts India Pvt. Ltd., A-24-25,	Handicraft
	EPIP, Shastripurm	
493	Chandra Packeging, B-17/6, Foundry Nagar,	Packer
	Agra	
494	Kamla Ram Packers, B-12, Site A, UPSIDC,	Packer
	Sikandra, Agra	
495	Balaji Poly Pack Industry, 21, Shadra Ind.	Poly Industries
	Estate, Nunhai, Agra	
496	Bhagwati Industries, D-20, UPSIDC, Sikandra,	Poly Industries
	Agra	
497	Krishna Polymers	Poly Industries
498	Maa Kela Devi Polymers	Poly Industries
499	Royal Poly Pack, C-31, Site-C, UPSIDC,	Poly Industries
	Sikandra, Agra	
500	Shakti Poly Tubes Pvt. Ltd., 592, Mathura	Poly Industries
	Road, Agra	
501	Shakti Polytex Pvt. Ltd., 592/1C-2C, Artoni,	Poly Industries
	Agra	
502	Sikarwar Plastic Poly Pack, Akabra Road,	Poly Industries
	Artoni, Agra	
503	Subhash Polymers, E-59, Foundry Nagar, Agra	Poly Industries
504	Sunder Polymers, E-93, Site-C, UPSIDC,	Poly Industries
	Sikandra, Agra	
505	Suresh Polymers, E-57, 58, Foundry Nagar,	Poly Industries
	Agra	
506	Ambica Poly Tubes, 13/22 A, Nunhai, Agra	Poly Industries
507	Bhargava Poly Vinayle Pvt. Ltd., C-15/3, 15/4,	Poly Industries
	Site-C, Sikendra, Agra	
508	Agra Marble Emporium, Kalwari, Bichpuri	Marble Factory
	Road, Agra	
	INDUSTRIES NOT IDE	ENTIFIED
S.NO	NAME AND ADDRESS OF INDUSTRIES	
509	Agra Industrial Corporation, 12/128 D, Nagla Ba	llchand, Nunhai, Agra
510	Anand Enterprises, C-56, Foundry Nagar, Agra	

511	Aryan Industries, 80, Kasra No. 120, Lakhanpur
512	Ascot International, M-809, Byepass Road, Near Lawyers colony, Agra
513	Asija Industries, Agra
514	Ashok Kumar Sharma, C-33, Site A, Sikandra Ind. Area, Agra
515	AVS International Pvt. Ltd., 32/76, Bagh Rajpur, Shaheed Nagar, Agra
516	B.R. Enterprises, E-39, 40, Foundry Nagar, Agra
517	Balkeshwar Silicate, Agra
	-
518	Brajesh and Brothers, 130, Industrial Estate, Nunhai, Agra
519	C.D. International, C-10, Site-A, UPSIDC, Sikandra, Agra
520	Canvas Products (India), 160 A, Ind. Estate, Nunhai, Agra
521	Concept Concievers & Executors, E-1, Site B, UPSIDC, Sikandra, Agra
522	Deepak Impex, Bichpuri Road, Wasan & Co. Compound), Agra
523	Garg Prijarveshion Private Limited, Bhagupur Firozabad Road, Agra
524	Gaur Enterprises, Agra
525	Gokul Chand & Sons, Langrey Ki Chowki, Agra
526	Harshit Enterprises, 19, Vidhyapuram, Foundry Nagar, Agra
527	ICON Enterprises, D-12, Site A, UPSIDC, Agra
528	Jain and Brothers, E-111, Site-C, UPSIDC, Sikandra, Agra
529	K.B. Enterprises, 81/1, Ind. State, Nunhai, Agra
530	K.S. International, A-12, EPIP, Sastripuram, Agra
531	Kailash (FORME) Creations (P) Ltd., C-36, Site A, UPSIDC, Sikandra, Agra
532	Karma Udyog, 9, Gailana Road, Agra
533	Katyaal Industies, 10 Km., Mathura Road, Agra
534	KTL Pvt. Ltd., 35/43 E, Mughal Road, Kamla Nagar, Agra
535	M.G. Industries, E-94, Site
536	Metro & Metro, 5/170, Halwai Ki Bagichi, Agra
537	N.P. Enterprises, 11B/91 B, Narich, Hathras Road, Agra
538	National Seeds Corporation Ltd., B-17, UPSIDC, Sikandra, Agra
539	Oriental Industries Corporation
540	Oriental Pathways Agra Pvt. Ltd.
541	P.C. Cosmo Sope Ltd., 655, Artoni, Mathura Road, Agra
542	Radha Raman Corogetors, 120, Lakhanpur, Sikandra, Agra
543	RCI, D-23, Site-C, UPSIDC, Sikandra, Agra
544	RNB Global Impex, 589A, Artoni, Agra
545	Rozar Industries Ltd., 157, 158, Artoni, Mathura Road, Agra

546	S.K.S. Global Pvt. Ltd., 289, Kirwali Road, Runakta, Agra
547	S.M. Enterprises, 77, Ind. Area, Nunhai, Agra
548	Seko Interlining
549	Sumangal Commercial Private Limited, Cold Storage, Village Kuberpur, Etmadpur, Agra
550	Sun Shine Industries, E-62, UPSIDC, Site-C, Sikandra, Agra
551	Super House Ltd., A-3, 4, EPIP, Shastripuram, Agra
552	T.R. and Sons, Bijnesa Pvt. Ltd., Village Nagla Asha, Nandpalpur, Hathras Road, Agra
553	Tej Hi Tech., 10/11, Km. Stone, Artoni, Agra
554	Tej International Pvt. Ltd., Agra Mathura Road, Artoni, Agra
555	The Thread Concept, C-12, Site-C, UPSIDC, Sikandra
556	Tata Project Limited
557	Top Lasts, 7.8 Km, Mathura Road, Near Sudhir Dharam Kanta, Sikandra, Agra-7



There are total 553 industries in Agra, out of which few are unidentified. From the list of industries that have been identified most of the industries are Orange Industries contributing 46% of the industries. There are only 98 industries (19%) under Green Category Industries.

Annexure 2.6: List of Environmental Clearances given to Projects in TTZ

MINING		TOPOGRAPHY												-	-	1	1		
\bar{\bar{\bar{\bar{\bar{\bar{\bar{	LOCATION	GITUDE																	
INFRASTRUCTURE	ТОС	LATITUDE LONGITUDE		1	1					1	1	1	1	1	1	1	1	1	
INFRAS		r NO.	GRA																
		TOPOSHEET NO.	DISTRICT- AGRA																
MENT		-	DIS	- 80	er -	80		er -	80	- 80	- 80	- 60	- 60	- 10	- 11	13 -	13 -	13 -	
AREA DEVELOPMENT	DATE OF EC	GRANTED		2 September 2008	11 September	2008		29 September	2008	18 December 2008	29 December 2008	19 March 2009	07 October 2009	10 July 2010	31 October 2011	31 January 2013	27 June 2013	23 August 2013	
				ıeme	of road	lal		lding	nent)									ing	
INDUSTRY	PROJECT			Solid Waste Management Scheme	Strengthening and widening of road	from Kheri Airport to Taj Mahal	(Infrastructure)	Complex "Banzara Mall" (Building	Construction/ Area Development)	Hotel Project	ADA Height	Large Scale Shopping	Integrated Township	Florence Vrindavan Height	Wave Hi-Tech Township	Group Housing Project	Group Housing Project	Expansion of Anand Engineering	College
	S.NO.			1	2			æ		4	2	9	7	∞	6	10	11	12	

	1	1	1	1			1	1	1	1	1	1	1	1	1	1		1	-
1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	-
11 October 2013	11 October 2013	11 October 2013	12 October 2013	12 October 2013	12 October 2013		12 October 2013	12 October 2013	12 October 2013	12 October 2013	12 October 2013	12 October 2013	12 October 2013	18 November 2014	29 January 2015	30 January 2015	18 March 2015	18 March 2015	18 March 2015
Integrated Township	Group Housing Project	Group Housing Project	Leather Park	Jaypee Green City	Expansion of Hindustan Institute of	Technology and Management	Group Housing Project	Township Project	Group Housing Project	Group Housing Project	Sand/ Morum Mining Project	Sand/ Morum Mining Project	Sand/ Morum Mining Project	Housing Project	Soil Mining Project	Soil Mining Project	Soil Mining Project	Soil Mining Project	Soil Mining Project
13	14	15	16	17	18		19	20	21	22	23	24	25	26	27	28	29	30	31

		204000+003 00			
25	Soli Milling Project	neguialdec zo	1	1	ı
		2015			
33	Group Housing Project	22 September	1		
		2015			
34	Group Housing Project	22 September	1		
		2015			
35	Group Housing Project	4 January 2016	1	-	1
36	Group Housing Project	14 January 2016	1	-	1
37	Affordable Housing Project	1 August 2017	1	27°12.074"N 77°58.118"E	1
38	Proposed Hotel Building	14 August 2017	54E15,54E16,54I4,54I3	27°9′58.19″N 78°3′19.08″E	Plain Land
39	Affordable Housing Project	4 December 2017	1		1
40	Ganpati Smart City	16 April 2018	1	1	1
41	Akbara-2 Ordinary Sand Mine	14 May 2018	54E15, 54E16	27°15′19.3″N 77°54′32.9″E	
	Project			27°15′06.3″N 77°54′34.0″E	
				27°15′06.9″N 77°54′27.5″E	
				27°15′21.4″N 77°54′26.3″E	
			DISTRICT- ETAH		
42	Jawaharpur Thermal Power Project	26 October 2016	1	27°29′20″N- 27°30′45″N	
				78°49′00″E- 78°50′36″E	
			DISTRICT- FIROZABAD		
43	Solid Waste Management	20 March 2009	1	-	1

1															1					1
27°04′03.9″N 78°22′51.5″E	27°04′55.8″N 78°23′02.0″E	27°04′53.1″N 78°22′59.3″E	27°04′01.0″N 78°22′49.1″E	26°58′01.8″N 78°29′02.9″E	27°57′52.9″N 78°29′08.9″E	27°57′50.7″N 78°29′05.0″E	27°57′58.4″N 78°28′57.4″E	27°05′20.6″N 78°16′18.4″E	27°05′17.82″N 78°16′14.41″E	27°05′03.87″N 78°16′25.79″E	27°05′07.22″N 78°16′30.36″E		1	1	ı	1		1	1	1
541/8				541/5				G44A8				DISTRICT- HATHRAS	-	-	-	-	DISTRICT- MATHURA	-	-	1
31 March 2018				16 March 2018				31 March 2018					16 October 2007	23 August 2014	18 March 2015	18 March 2015		20 March 2009	29 April 2009	
Ordinary Sand Mining Project				Ordinary Sand Mining Project				Niyamatpur Ordinary Sand Mine					Molesses based distillery unit	Soil Excavation	Soil Mining Project	Soil Mining Project		Solid Waste Management	Amarpali Kahna	Biomass Power Plant
65				99				29					89	69	70	71		72	73	74

To max Eternity 10 July 2010 17738'S8"E-77"39'S8"E-77"39'S"E 17738'S8"E-77"39'S"E 17738'S"E-77"39'S"E 17738'S"E-77"39'S"E 17738'S"E-77"39'S"E 17738'S"E-77"39'S"E 17738'S"E-77"39'S"E 17738'S"E-77"39'S"E 17738'S"E-77"39'S"E-77"39'S"E 17738'S"E-77"39'S"E 17738'S"E-77"39'S"E-77"39'S"E 17738'S"E-77"39'S"E-77"39'S"E 17738'S"E-77"39'S'E-77"39'S'E-77"3	75	I.A. Kosi Kotwan	1 April 2010	1		
Omax Eternity 10 July 2010 - 27°34'08"N- 27°34'08"N- 27°34'08"N- 27°34'08"N- 27°34'08"N- 27°34'08"N- 27°34'08"N- 27°34'08"N- 27°34'08"N- 27°38'30"N- 27°00 of the modiate and seartive Dyes 7 October 2013 -	92	4	10 July 2010	1		
Group Housing Project 7 October 2013 -	77		10 July 2010	1	27°34′08″N- 27°34′49″N	Plain Land
Housing Project					77°38′58″E- 77°39′25″E	
Project	78		7 October 2013	ı		
Plant for H-Acid, Intermediate and Reactive Dyes Plant	79		8 October 2013	ı		
Plant for H-Acid, Intermediate and Reactive Dyes 22 June 2015 54E11, 54E15 27°23'41.04"N-27°28'8.06"N LPG Bottling Plant 22 June 2015 54E11, 54E15 27°23'41.04"N-27°28'8.06"N Sand Mining Project 28 October 2015 - - Installation of Gas Turbines with 15 December 2015 - - HRSC at Mathura Refinery 15 December 2015 - - Sand Mining Project 15 December 2015 - - Quality Improvement Project at 13 September 54E11,54E15 27°22.915"N-27°23'32.52"N Mathura Refinery 2017 27°52.442"N 78°32.947"E 27°52.499"N 78°32.947"E Project 27°52.338"N 78°32.947"E 27°52.338"N 78°33.290"E Project 27°52.338"N 78°33.280"E 27°52.338"N 78°33.280"E	80		22 June 2015	1		
Reactive Dyes 22 June 2015 54E11, 54E15 27°23'41.04"N-27°28'8.06"N LPG Bottling Plant 28 October 2015 - - Sand Mining Project 28 October 2015 - - Installation of Gas Turbines with 15 December 2015 - - HRSC at Mathura Refinery 15 December 2015 - - Sand Mining Project 15 December 2015 - - Quality Improvement Project at 13 September 54E11,54E15 27°22'9.15"N-27°23'32.52"N Mathura Refinery 2017 27°52.442"N 78°32.947"E - Shernagar Khadar Sand Mining 27 January 2018 643F9, 643F6 27°52.499"N 78°32.947"E Project 27°52.338"N 78°33.292"E 27°52.301"N 78°33.280"E		Plant for H-Acid, Intermediate and				
LPG Bottling Plant 22 June 2015 54E11, 54E15 27°23'41.04"N- 27°28'8.06"N Sand Mining Project 28 October 2015 - - Installation of Gas Turbines with HRSC at Mathura Refinery 15 December 2015 - - Sand Mining Project 15 December 2015 - - Quality Improvement Project at Mathura Refinery 13 September 54E11,54E15 27°22'9.15"N- 27°23'32.52"N Mathura Refinery 2017 2017 27°52.442'N 78°32.947'E 27°52.499'N 78°32.947'E Project 27°52.338'N 78°33.280'E 27°52.338'N 78°33.280'E 27°52.301'N 78°33.280'E		Reactive Dyes				
Sand Mining Project 28 October 2015 -	81		22 June 2015	54E11, 54E15	27°23'41.04"N- 27°28'8.06"N	
Sand Mining Project 28 October 2015 - - Installation of Gas Turbines with HRSC at Mathura Refinery 15 December 2015 - - Sand Mining Project 15 December 2015 - - Quality Improvement Project at Mathura Refinery 13 September 54E11,54E15 27°22'9.15"N- 27°23'32.52"N Mathura Refinery 2017 77°41'3.69"E-77°41'53.47"E - Shernagar Khadar Sand Mining 27 January 2018 G43F9, G43F6 27°52.499'N 78°32.947'E Project 27°52.338'N 78°33.290'E 27°52.301'N 78°33.280'E					77°40′33.13″N 77°40′55.40″E	
Installation of Gas Turbines with 15 December 2015 - - HRSC at Mathura Refinery 15 December 2015 - - Quality Improvement Project at Mathura Refinery 13 September 54E11,54E15 27°22'9.15"N- 27°23'32.52"N Mathura Refinery 2017 77°41'3.69"E- 77°41'53.47"E 27°52.442'N 78°32.947'E Shernagar Khadar Sand Mining 27 January 2018 G43F9, G43F6 27°52.499'N 78°32.947'E Project 27°52.338'N 78°33.280'E 27°52.338'N 78°33.280'E	82		28 October 2015	ı	1	
HRSC at Mathura Refinery 15 December 2015 - - Sand Mining Project 13 September 54E11,54E15 27°22'9.15"N- 27°23'32.52"N Quality Improvement Project at Mathura Refinery 2017 77°41'3.69"E- 77°41'53.47"E Shernagar Khadar Sand Mining 27 January 2018 643F9, 643F6 27°52.499'N 78°32.947'E Project 27°52.338'N 78°33.292'E 27°52.338'N 78°33.280'E	83		15 December 2015	ı	•	
Sand Mining Project 15 December 2015 - Quality Improvement Project at Mathura Refinery 13 September 54E11,54E15 27°22'9.15"N- 27°23'32.52"N Mathura Refinery 2017 77°41'3.69"E- 77°41'53.47"E Shernagar Khadar Sand Mining 27 January 2018 643F9, G43F6 27°52.442'N 78°32.947'E Project 27°52.338'N 78°33.280'E 27°52.301'N 78°33.280'E		HRSC at Mathura Refinery				
Quality Improvement Project at 13 September 54E11,54E15 27°22′9.15″N- 27°23′32.52″N Mathura Refinery 2017 77°41′3.69″E- 77°41′53.47″E Shernagar Khadar Sand Mining 27 January 2018 G43F9, G43F6 27°52.442′N 78°32.947′E Project 27°52.499′N 78°33.292′E 27°52.338′N 78°33.280′E	84		15 December 2015	ı	1	
Mathura Refinery 2017 77°41′3.69″E-77°41′53.47″E Shernagar Khadar Sand Mining 27 January 2018 G43F9, G43F6 27°52.442′N 78°32.947′E Project 27°52.499′N 78°33.292′E 27°52.338′N 78°33.280′E	85		13 September	54E11,54E15	27°22'9.15"N- 27°23'32.52"N	1
Shernagar Khadar Sand Mining 27 January 2018 G43F9, G43F6 27°52.442'N 78°32.947'E Project 27°52.499'N 78°32.947'E 27°52.338'N 78°33.292'E 27°52.338'N 78°33.280'E 27°52.301'N 78°33.280'E		Mathura Refinery	2017		77°41′3.69″E- 77°41′53.47″E	
27°52.499′N 78°32.947′E 27°52.338′N 78°33.292′E 27°52.301′N 78°33.280′E	98		27 January 2018	G43F9, G43F6	27°52.442′N 78°32.947′E	Undulated Riverbed Covered
27°52.338′N 78°33.292′E 27°52.301′N 78°33.280′E		Project			27°52.499′N 78°32.947′E	with river fed sand
27°52.301′N 78°33.280′E					27°52.338′N 78°33.292′E	
					27°52.301′N 78°33.280′E	

87	Expansion of Omax Eternity	5 February 2018	1	27°34′08″N- 27°34′49″N	Plain Land
				77°38′58″E- 77°39′25″E	
88	Sand/ Moram Mining Project	14 May 2018	1	27°35′55.65″N 77°40′47.30″E	27°35′55.65″N 77°40′47.30″E Plain River Bed and Banks of the
					River
		<u>10</u>	DISTRICT- BHARATPUR		
89	Mining Project	13 May 2013	1	26°59′12″N- 27°00′24″E	1
				77°36′00″E- 77°37′35″E	
06	Mineral Masonry Stone Mining	25 October 2016	54E/2	27°32'46.6"N 77°09'32.9"E	Hilly Ranges
91	Area Development Project	06 November 2017	ı	27°11′56.35″N 77°28′24.67″E	
95	92 Mining Project	05 March 2018	2018 54F/9,54F/5,54F/12	1	Hilly Slopes

Annexure 2.7: Chronology of Supreme Court Orders

DATE OF JUDGEMENT	ORDER NUMBER	ORDERS PASSED
3 rd September 1984		SC issues notice on petition by MC Mehta, saying pollution from units in Agra and the adjacent town of
		Firozabad, and Mathura refinery is a threat
8 th January 1993		Direct UPPCB to get a survey done of the area and prepare a list of all the industries and foundries which
		are source of pollution in the area.
		The Pollution Board after the survey was to issue the notice to all foundries/ industries to satisfy the Board
		that necessary anti-pollution measures have been undertake and was asked to submit the Report on this
		to the Court by May 5, 1993
5 th May 1993		511 industries were reported to undertake anti-pollution measure. UPPCB was directed to issue public
		notice by getting the same published in 2 local and 2 national newspapers calling upon these industries to
		install anti-pollution mechanism/ affluent treatment plants if they have not already done so within 2
		weeks.
		Industries were called upon to file replies to the notice already issued by Board within 8 weeks from
		publication of the notice in newspaper.
		After getting replies from industries and processed by Board, Board can inspect any industry to check the
		correctness of the replies.
July 1993		NEERI says units using coal and coke as fuel are the major polluters; suggests changes in TTZ boundaries
27 th August 1993		Closure order passed against 212 industries that failed to install air pollution control devices.
19 th November 1993		Mr. Goswami was given time till 26 th November 1993 to find out the possibility of providing Gas as a fuel
		to Glass Industries and the foundries around Agra.

	He must file concrete proposal before next date.
26 th November 1993	Mr. R.P. Sharma, General Manager, Marketing and Planning, Gas Authority of India Ltd. had filed an
	affidavit dated, 23 rd November 1993, stating that without undertaking the detailed survey with regard to
	the assessment of demand and other technical requirements, it would not be possible to proceed further
	in this matter.
October 1993	NEERI submits report on SO ² emission control measures for Mathura refinery, recommends use of natural
	gas as fuel
11 th February 1994	The Court asked NEERI to examine the possibility of using propane or any other safe fuel instead of
	coal/coke by the industries in TTZ.
	SC directed UPSIDC to locate sufficient areas outside the TTZ to relocate industries.
25 th February 1994	SC examines NEERI recommendations on the use of gas fuel in Mathura refinery and other units in TTZ.
	Ordered the Chairman of the Oil and Natural Gas Commission, the Chairman of the Indian Oil Corporation
	and the Chairman of the Gas Authority of India to be personally present in the Court on 8 th March 1994.
4 th March 1994	U.P. State Industrial Corporation Limited filed an affidavit on 3 rd March 1994, stating that the corporation
	has 220 acres (151 plots) developed land in Kosi for immediate allotment. And 330 acres undeveloped land
	in Salimpur and 85 acres in Etah.
	They directed the Secretary, Department of Industries, Government of U.P., to file a list of all air polluting
	industries within the TTZ within a week.
8 th March 1994	As ordered on 25 th February, Chairmen were present. SC discussed its view point with Shri Malik, Shri
	Kapur, Shri Shah and Shri Bakshi and were requested to file a note each with regard to the discussion
	within 5 days.

31st March 1994	SC ordered UPSIDC to examine the demand of each of the industry and thereafter locate the requisite area
	outside the TTZ for shifting these industries.
11 th April 1994	Court passed the order indicating that as a first phase of industries situated in Agra be relocated out of
	ТТZ.
29 th April 1994	Court shows interest in having another investigation/report from a reputed technical/engineering
	authority. MoEF, GOI may examine this aspect and appoint an expert authority to undertake the survey of
	the Taj Trapezium Environmental Area and make a report regarding the source of pollution and the
	measures to be adopted to control the same.
18 th May 1994	MoEF appointed an expert committee under the chairmanship of Dr. S. Varadharajan
5 th August 1994	Mr. M.C. Mehta, the petitioner suggested that it would be economical and time saving to lay the pipelines
	from Auria or Babrala to Mathura in conformity to NEERI report. SC ordered Indian Oil Corporation to
	place the suggestion in front of experts and assist the Court on 8 th August 1994
8 th August 1994	According to Mr. B.B. Chakravarty, General Manager, Safety and Environment Protection, Indian Oil
	Corporation, Suggestion by M.C. Mehta is not feasible. The scheme of laying pipeline from Bijapur to Dadri
	via Mathura had been sanctioned and is being implemented. SC directs the Gas authority to summit an
	affidavit through some responsible officer, showing the progress made till date in the above project and
	whether it is possible to prepone the date of commissioning of the project from June 1996 to December
	1995.
29 th August 1994	Considering 57,800 workers would be affected, SC orders setting up another panel to probe pollution
	sources; panel constituted under S Varadarajan.

	GAIL TIIEG an attidavit indicating the progress of laying pipelines to supply natural gas to iviathura ketinery
	and other industries in TTZ. It also stated that all efforts were being made to complete the project by
	December, 1996.
April 1995	Varadarajan panel submits report, recommends relocation of industries out of TTZ
3 rd August 1995	SC orders the Centre and Uttar Pradesh government to prepare relocation scheme within 4 weeks
	Court also directs MoEF to examine the NEERI report and Vardharajan Report and indicate in positive
	terms the measures which the Ministry is intending to take to preserve the Taj Mahal.
20 th February 1996	SC takes note of none of NEERI's recommendations had been enforced by the Center
3 rd March 1996	SC orders expediting construction of bypass road to check pollution from 14,000 trucks passing through
	the city.
14 th March 1996	SC directed GAIL, Indian Oil Corporation and UPSIDC to indicate the industrial areas outside the TTZ which
	would be connected by gas supply network.
10 th April 1996	SC directed the Collector, Agra as well as Collector, Ferozabad to render all assistance to GAIL in acquiring
	land for setting up the two stations for public purposes.
	Construction of Agra Bypass to divert the through traffic. 24km stretch to be completed by the end of
	December 1996.
10 th May 1996	All brick kilns ordered to stop operating within 20 km from Taj
7 th August 1996	SC ordered to set up 50 hospital beds and two dispensaries by Mathura Refinery to provide medical aid to
	the people living in the surrounding area
30 th August 1996	The construction of Gokul Baggage, water supply work of Gukul Barrage, roads around Gokul Barrage, Agra
	Barrage and water supply of Agra Barrage and to bring Yamuna back to life

10 th September 1996	Additional amount of Rs. 99.54 crores sanctioned by the Planning Commission to be utilized by the State
	Government for construction of electricity supply projects to ensure uninterrupted electricity in TTZ
12 th September 1996	The Court passed order regarding the safety measures to be taken during the construction and operation
	of the gas network in Taj Trapezium.
30 th December 1996	A list of 292 industries causing air pollution was submitted. These 292 industries were directed to change-
	over to natural gas as an industrial-fuel. If this can't be done due to any reason can approach UPSIDC
	before February 28, 1997 for allotment of alternative plot outside TTZ.
	Those industries who don't apply for natural gas or alternative plot shall stop working with effect from
	April 30, 1997.
24 th March 1998	Polluting vehicle prohibited within 500 m of the Taj Mahal
13 th May 1998 S.O. 350(E)	The Central Government constitutes an authority to be known as Taj Trapezium Zone Pollution (Prevention
	and Control) Authority consisting of the following 8 persons for a period of 2 years, namely:
	ο Commissioner, Agra Division
	$\hat{\sigma}$ Chairman, Uttar Pradesh State Pollution Control Board
	∂ Deputy Inspector General Of Police, Agra Range
	∂ Member-Secretary, Central Pollution Control Board
	∂ A representative of the Ministry of Petroleum and Natural Gas
	∂ A representative of the Ministry of Environment and Forests
	∂ A representative of Archaeological Survey of India
	∂ Vice-Chairman, Agra Development Authority
	The authority should monitor progress of the implementation of various schemes for protection of Taj
	Mahal and programmes for protection and improvement of the environment in TTZ. Authority have power

	to take all necessary steps to ensure Compliance of specified emission-standards by motor vehicles and
	ensuring compliance for fuel quality standards.
	The foregoing power and functions of the authority shall be subject to the overall supervision and control
	of the Central Government.
	Authority may co-opt experts for facilitating the work assigned to it.
	The authority shall furnish the report about its activities at least once in two months to Central Govt. the
	Ministry of Environment and Forests.
	The Authority shall have it headquarter in Agra.
4 th September 1998	SC takes note of NEERI and CPCB report on sewerage system for Agra; no pumping station allowed within
	500m of the Taj
11 th November 1998	SC asks Union environment ministry to release funds for green belt
12 th December 1998	All commercial activity in protected monument in TTZ banned
23 rd February 1999	Cabinet Committee on Economic Affairs approves schemes worth Rs 222.21 crores for projects to improve
	air, water and land in Agra.
17 th May 1999	TTZ Pollution (Prevention and Control) Authority constituted to monitor schemes for protecting the Taj
3 rd November 2000	SC directs CPCB to lay down special air and noise pollution standards for TTZ
7 th November 2000	SC directs setting up four air quality monitoring station in Agra.
29 th November 2000	Uttar Pradesh sanctions Rs 4.56 crores for Agra Heritage Fund
14 th December 2000	SC orders the Centre to release funds to ensure survival of 1,215,500 saplings planted by U.P. forest
	department for a green belt around the Taj at a cost of Rs 4.03 crore
3 rd October 2001	Foundry owners asked to file undertaking to switch to gas-based technology by October 10, 2001, falling
	which they would close

11 th April 2002		SC takes note of CPCB report, saying air quality has still not improved. UPPCB asked to ascertain reasons
16 th July 2003		SC orders CBI inquiry into Rs 175 crore Taj Heritage Corridor scam after diversion of the Yamuna river, to
		reclaim over 30 ha between Agra Fort and Taj Mahal for food plazas and shops, is noticed
19 th August 2003		SC orders crackdown on illegal mining in Mathura as it was said to be contributing to pollution
21 st August 2003	I.A. NO. 376	Court ordered CBI to verify from assets of the officers/ persons as to whether there was any flow of funds
		into their accounts from the state exchequers
19 th July 2004	I.A. NO. 376	Court directed CBI to furnish a self-contained note in respect of its findings against the officers of the State
		Government/ Central Government.
25 th October 2004	I.A. NO. 376	Court noted that two disciplinary enquiries were required to be instituted by the state Government
		against Shri Punia, former Principal Secretary to C.M., U.P.
14 th March 2005	I.A. NO. 431	Court after going through CVC Act, 2003 directed the records relating to prosecution of twelve accused be
		placed before Central Vigilance Commission for scrutiny and recommendation.
27 th November 2006	I.A. NO. 431	SC approves the proposal for construction of 2 Visitors' Centers, one on the western side and the other on
		the eastern side at the sites indicated in the presentation. However, the Court ordered that the actual
		construction of the Centers should start only after the final plans are presented and approved.
10 th October 2007	I.A. NO. 465 of	Mr. Krishna Mahajan, learned Amicus Curie, filed an application praying the Court to issue an appropriate
	2007	writ petition, direction and order. The Court made the judgment to entertain the application filed and was
		dismissed with the aforesaid observations.
18 th January 2010	I.A. NO. 474 of	SC directs the CBI to place evidence/ material collected by the investigating team along with the reports of
	2010	the S.P. as required under Section 173(2) (Taj Corridor Scam)
January 2015		All commercial vehicles operating around Taj ordered to shift to CNG by July 31 following an Indo-US study
		on discoloration of the Taj.

March 2015	SC pulls up Uttar Pradesh for making false claims about planting trees to compensate for trees felled for
	development projects
17 th November 2015	SC sent a clear warning to U.P. Government not to allow destruction of aesthetic beauty of Taj by poor
	quality of constructions around.
4 th January 2017 S.O. 36(E)	The Central Government makes the following amendments in Order of the GOI in the MoEF number S.O.
*	489(E), dated 30 th April 2003.
	∂ In paragraph 1, in the said order, for the word "for a period of thirteen years and eight months"
	the word "for a period of fifteen years and eight months" shall be substituted
	∂ For the said number 1 to 18 and the entries related there to, the following shall be substituted
	1. Commissioner, Agra Division
	2. District Magistrate, Agra, U.P.
	3. District Magistrate, Mathura, U.P.
	4. District Magistrate, Etah, U.P.
	5. District Magistrate, Hathras, U.P.
	6. District Magistrate, Firozabad, U.P.
	7. District Magistrate, Bharatpur, U.P.
	8. Secretary, MoEF, GOI or his Representative
	9. Secretary, Ministry of Petroleum and Natural Gas or his Representative
	10. Director General, ASI or his representative
	11. Municipal Commissioner, Agra
	12. Principal Secretary, Environment Department, Government of Uttar Pradesh or his
	representative

13. Secretary, Environment Department , Government of Rajasthan or his representative	14. Member Secretary, Central Pollution Control Board or his representative	15. Member Secretary, U.P. Pollution Control Board or his representative	16. Member Secretary, Rajasthan Pollution Control Board or his representative	17. Deputy Inspector General of Police, Bharatpur Range	18. Deputy Inspector General of Police, Agra Range or his representative	19. Deputy Chief Wildlife Warden, Bharatpur Birds Sanctuary	20. Superintending Mining Engineer, Department of Mines and Geology, Bharatpur, Rajasthan	21. Three Representatives Public/ Civil Society to be nominated by the Central Government	22. Vice-Chairman, Agra Development Authority

Annexure 2.8: Major Projects Proposed in TTZ

YEIDA - INTEGRATED INDUSTRIAL TOWNSHIPS

Yamuna Expressway Industrial Development Authority has proposed 5 integrated industrial townships all the way from Noida to Agra. Out of these, only one township have detailed plan (Master Plan 2031) with a total area of 247 sq. km. and a population of 35 lakhs, whereas, rest of the townships are under consideration for development and detailed Master Planning.

The existing power source in this region is NTPC, Dadri Coal and Gas based Power Plant. There are also proposed infrastructures for Power Source – Coal and Ignite – 6100 MW (NTPC, ROSA P.C., UPRVUNL, IPP.). Also Yamuna Power Generation Company had been created to address YEIDA Region. Proposed 765 KVA Substation of 3000 MW capacity at Jahangirpur, YEIDA Region.

Yamuna Basin consisting 3 rivers — Yamuna, Hindon and Kali has a huge amount of unused floods which can be explored as source of water in the region by building reservoirs. A huge network of Canals passes through this region which has potential to source domestic and industrial purposes in addition to irrigation.

Existing GAIL gas pipeline network passes close to YEIDA Region. Efforts are made to develop Gas Grid and connecting prominent industrial areas within it for the provision of clean fuel.

Annexure 2.9: Projects as per CEMP TTZ 2013

ion/Reduction of Water	Implementing Agency/ Responsibility		ANN/ADA/ PSDC/ UPJN		UPPCB/ CPCB/MEF/ UPPCB
· Different Sectors/Activities Leading to Minimization/Reduction of Water Pollution in TTZ Region	Status & Suggested Action Plan	Construction of the branch sewers connecting to the trunk sewers.	 Improvement and laying of trunk sewers. 	Expansion of water supply network.	 Arresting entry of solid waste into the storm water drainage network
	Ward	Impeypura, Telipara, Nagla Kaachpura, Paktola, Naibasti, Baghichi, Lachipura, Telipara, Paktola, Nagla din, PayerlalkaNagla, Garhichandini, Garhi,	Hussaninpura, Nagladevjit, Tajgani, Papal Mandi, Kashmiri Bazaar, Naulakha Bazaar, Phawara Bazaar, Nawalgang, NaglaBaluchand, Motibagh, Pratapur, Mohanpura,	Khanderu, Jawahar Bazaar, Kala Mahal Bazaar, Ukhara, Charaungi, Kachipura, Ramjokanagla, Chatta Bazaar, Daseri, Freeganj,	Sadar, Bazaar, Sevka Bazaar, Subhash Bazaar, Hariparwat, Krishna colony, Belanganj, Nehru Nagar, Kamala Nagar, Bhairon,
Status and Suggested Action Plans for	Problem	Inadequate sewer network coverage	Inadequate storm water drainage coverage	Natural drains carry untreated sewage to STPs & river Yamuna	Discharge of untreated peta effluents
tatus and S	Area	Agra			
S	S. no.	П			

				NN/CPCB/UPPCB/MEF						UPPPCB/ Nagar Nigam
• Construction of trunk sewer to collect sewage from sewer line laid along major drains to avoid direct discharge of sewage into Yamuna River.	Construction of ETPs for clusters of industries like peta and tanneries.	 Development of greenbelt along the open drains/natural drains 	Laying of trunk sewers for collection of sewage.	Construction of the branch sewers connecting trunk sewers.	Complete tapping of sewage generated and treatment in STPs, thereby reducing the pollution in Yamuna.	Arresting solid waste entry into the storm water network	Periodical removal of solid waste from this area.	Construction of drainage lines in unserviced areas and streets.	Provision for pumping of storm	Construction of new STP and renovation of existing ones for meeting the standards.
Ghatwasan I, GhatwasanII, Lohamandi, Bodla I, Khandari II, Trans Yamuna II			5		Krishna Nagar, Ambedkar Nagar, pockets of Mohali road, New Bus Stand Bhuteshwar and areas					Kalidegu, Masa
Inadequate sewer network coverage			No sewage and storm water network							Inadequate sewage and Drainage network.
			Mathura							Vrindavan
			2							3

				1			
		Nagar Nigam/ UPJN			Nagar Nigam/ UPJN	MI CIT / Second National Natio	ומפטמו ואוטמוון סרטא
Interceptors at outfalls to the Yamuna as per networks plans.	Construction of new drains and repairs to existing drains.	Dumping of solid waste into the storm water drains should be banned to prevent clogging of the natural drain and reduce the pollution of Yamuna River.	A new STP should be proposed/constructed for treatment of sewage generated in the city.	Construction of new sewerage system on the basis of network plan.	A new STP should be proposed/constructed for treatment of sewage generated in the city.	Construction of new sewers on the basis of network plan, on the basis of pumping stations.	A new STP should be proposed/constructed for treatment of sewage generated in the city.
		NA		NA		GopalNagla village, Wetland areas	
		Clogging of Natural drains.	Inadequate sewage and drainage network.	No sewer network and drains		No sewer network and drains	
		Firozabad		Eatebolir	Sikri	Bharatpur	
		4			ω	9	

Annexure 2.10: Report of the Parliamentary Committee on effects on pollution on Taj, 22nd July 2015



PARLIAMENT OF INDIA RAJYA SABHA

DEPARTMENT-RELATED PARLIAMENTARY STANDING COMMITTEE ON SCIENCE & TECHNOLOGY, ENVIRONMENT & FORESTS

TWO HUNDRED SIXTY SECOND REPORT

ON

EFFECTS OF POLLUTION ON TAJ

(PRESENTED TO THE RAJYA SABHA ON THE $21^{\rm ST}$ JULY, 2015) (LAID ON THE TABLE OF THE LOK SABHA ON THE $22^{\rm ND}$ JULY, 2015)



RAJYA SABHA SECRETARIAT NEW DELHI JULY, 2015/ ASHADHA, 1937 (SAKA)

CONTENTS

PAGES

1. COMPOSITION OF THE COMMITTEE

2. PREFACE

3. ACRONYMS

4. REPORT OF THE COMMITTEE

5. SUMMARY OF THE RECOMMENDATIONS

6. MINUTES OF THE MEETINGS OF THE COMMITTEE

7. INDEX OF REPORTS

[•] To be appended at printing stage

MEMBERS OF THE DEPARTMENT-RELATED PARLIAMENTARY STANDING COMMITTEE ON SCIENCE & TECHNOLOGY, ENVIRONMENT & FORESTS

(2015-16) -----

1. Shri Ashwani Kumar — *Chairman* RAJYA SABHA

- 2. Shri Anil Madhav Dave
- 3. Shri Prem Chand Gupta
- 4. Shri C.P. Narayanan
- 5. Shri Paul Manoj Pandian
- 6. Dr. T. Subbarami Reddy
- 7. Shri Arvind Kumar Singh
- 8. Shri Bhupinder Singh
- 9. Smt. Bimla Kashyap Sood
- 10. Shri Ronald Sapa Tlau

LOK SABHA

- 11. Shri Badruddin Ajmal
- 12. Shri Muzaffar Hussain Beig
- 13. Smt. Bijoya Chakravarty
- 14. Shri Pankaj Chaudhary
- 15. Shri Prabhatsinh Pratapsinh Chauhan
- 16. Kum. Sushmita Dev
- 17. Shri Ninong Ering
- 18. Shri Laxman Giluwa
- 19. Dr. K. Gopal
- 20. Shri Daddan Mishra
- 21. Shri Shivaji Adhalrao Patil
- 22. Shri Nana Patole
- 23. Shri Nagendra Kumar Pradhan
- 24. Shri Harinarayan Rajbhar
- 25. Smt. Sandhya Roy
- 26. Shri Kirti Vardhan Singh
- 27. Shri Nagendra Singh
- 28. Smt. Renuka Sinha
- 29. Shri Vikram Usendi
- 30. Smt. Vasanthi M.
- *31. Shri Chirag Paswan

SECRETARIAT

Shri M.K. Khan, Joint Secretary

Shri Rohtas, Director

Shri V.S.P. Singh, Joint Director

Shri Rajiv Saxena, Assistant Director

^{*} Nominated w.e.f. 25th March, 2015.

PREFACE

- I, the Chairman of the Department-related Parliamentary Standing Committee on Science & Technology, Environment & Forests, having been authorized by the Committee to present the Report on its behalf, present this Two Hundred and Sixty-second Report on 'Effects of Pollution on Taj'.
- 2. The Committee heard the various officers of Central Government and State Government of Uttar Pradesh on the subject in its meeting held on 10th January, 2015. The Committee also undertook a study visit to Agra on the 10th and 11th April, 2015 and heard the representatives of Civil Society Organizations/NGOs and industrial units as well as the concerned Central and State Government officers on the 10th April, 2015.
- 3. The Committee expresses its thanks to the officers of the Central Government and State Government of Uttar Pradesh and Civil Society Organizations/NGOs and industrial units for rendering their valuable views/replies to clarifications sought by the Committee.
- 4. In its meeting held on 3rd July, 2015, the Committee considered the draft report and adopted the same.

NEW DELHI:	ASHWANI KUMAR
3 rd July, 2015	Chairman
	Department-related Parliamentary Standing Committee
	on Science & Technology, Environment & Forests

REPORT

GENESIS

- 1. The Taj Mahal, a national monument and an iconic image of India, attracts millions of visitors every year. A study by two scientists at the Indian Institute of Technology (Kanpur) in the journal Environmental Science & Technology of American Chemical Society had claimed discolouration of the Taj Mahal due to particulate carbon and dust deposition. Results indicated that light-absorbing dust, black carbon and brown carbon generated from combustion of fossil fuels and biomass were responsible for its discolouration. Their findings suggested that the deposition of light absorbing particulate matter in regions of high aerosol loading were not only influencing cultural heritage but also the aesthetics of both natural and urban surfaces. These findings were reported in the media and the entire nation was concerned about it.
- 2. In this background, the Department related Parliamentary Standing Committee on Science & Technology, Environment & Forests decided to take up the subject 'Effects of Pollution on Taj' for its examination and report.
- 3. In its meeting held on the 10th January 2015, the Committee heard the representatives of the Union Ministry of Environment, Forest & Climate Change, Central Pollution Control Board, Taj Trapezium Zone Authority, Uttar Pradesh Pollution Control Board (UPPCB) and the Archaeological Survey of India, on the subject.

Taj Trapezium Zone

- 4. The Committee was informed by the Ministry of Environment, Forest & Climate Change that various orders have been passed by the Hon'ble Supreme Court of India (with reference to the WC 13381/1984, M.C. Mehta Vs. Union of India and others) for improvement of environmental quality in Taj Trapezium Zone for protection of Taj Mahal. Some important directions of the Hon'ble Supreme Court regarding protection of Taj Mahal were as under:
 - (i) Shifting of industries from Taj Trapezium in a phased manner.
 - (ii) the atmospheric pollution in TTZ has to be eliminated at any cost. Not even one percent chance can be taken when human life apart the preservation of prestigious monuments like Taj is involved.
 - (iii) Those industries, which neither apply for gas nor for alternative industrial plot, shall stop functioning. Supply of coal/coke to the said industry shall be stopped forthwith.
 - (iv) Construction of Agra bypass to divert all the traffic
 - (v) To ensure uninterrupted electricity to the TTZ
 - (vi) The city should be provided with scientifically designed, constructed and operated sewerage system with high priority.
 - (vii) Proper parking and traffic management for Taj
 - (viii) Regular monitoring of Ambient Air Quality in and around Taj.
- 5. Ministry of Environment, Forest & Climate Change, Government of India declared Agra-Mathura region as air pollution protected area namely the Taj Trapezium Zone (TTZ) in the year 1983. The Taj Trapezium Zone Pollution (Prevention & Control) Authority, the trapezium (area 10400 sq.km.) bounded between 26⁰ 45'N & 77⁰ 15'E to 27^o 45' N & 77⁰ 15'E in the west of the Taj Mahal and in the East of Taj Mahal between
- 27000'N & 78^030 'E to 27^030 'N & 78^030 'E, for protection and improvement of the environment in the TTZ, was created *vide* notification dated May 17, 1999 under the Chairmanship of Commissioner, Agra Division consisting of the following members-
 - 1. Commissioner, Agra Division

2. Chairman, U.P. State Pollution Control Board
 3. D.I.G. of Police, Agra Range
 4. Member-Secretary, CPCB
 5. A representative of the MoPNG
 6. A representative of the MoEF, GoI
 7. A representative of the ASI
 8. Vice-Chairman, Agra Development Authority
 Member
 Member
 Member
 Member

- 6. The Authority was reconstituted by Ministry of Environment, Forest and Climate Change, Government of India *vide* notification dated 14th January, 2015 and the number of members increased to 18.
- 7. Stating the problems of TTZ, the Chairman of TTZ informed the Committee that no administrative set-up has been constituted for TTZ Authority. Therefore, no mechanism is available to implement the decisions of the TTZ Authority. Vice-Chairman, Agra Development Authority is the Member Convener and therefore routine works of TTZ Authority are discharged by a few officers of Agra Development Authority. For all practical purposes, TTZ Authority is not functioning optimally as it consists of only members with no supporting staff. No budget is allocated for proper functioning of TTZ Authority. As regards the funds released by the Ministry of Environment, Forests and Climate Change to the Authority during the last three years, the Committee was informed that no funds were released by the Ministry during the last three years. The routine expenditure of TTZ Authority is provided by Agra Development Authority. The routine expenditure involves filing of regular affidavits in the Hon'ble Supreme Court on behalf of Chairman of TTZ Authority and Chief Secretary of Uttar Pradesh on behalf of Mission Management Board, to organize regular meetings of TTZ Authority, honoraria to one clerk and two peons, postage, refreshment, stationary, etc.
- 8. The Committee was informed by the representative of Taj Trapezium Zone Authority that the important actions taken by various agencies for improvement of environmental quality in TTZ for protection of Taj Mahal were as under:-
 - (i) Closure of coal based Thermal Power Plants
 - (ii) Dieselization of Railway Yards
 - (iii) Prohibition of establishment/expansion of polluting industries
 - (iv) Closure of coal/coke based industries at Agra & closure of polluting industries, except those equipped with adequate Pollution Control Systems in TTZ.
 - (v) Closure of Approx. 450 Brick Kilns within TTZ
 - (vi) Supply of Natural Gas to Mathura Refinery and Industries of Agra & Firozabad in phased manner
 - (vii) Setting up of improved Sulphur Recovery Units at Mathura Refinery
 - (viii) Supply of ultralow sulphur Diesel to vehicles/industries/D.G sets in Agra
 - (ix) Restriction of plying of Petrol, diesel driven vehicles around 500 meter of Taj Mahal.
 - (x) Plying of Battery operated Buses and other vehicles within 500 meter of Taj Mahal.
 - (xi) Fixation of age for public and commercial vehicles
 - (xii) No new registration of age barred vehicles
 - (xiii) Use of Gas/Eco-friendly fuel by industries
 - (xiv) Supply of CNG for vehicles at Agra
 - (xv) Green belt development & other infrastructure development near monuments.

- (xvi) Ban on burning of biomass, leather cuttings and cow dung in Agra specially areas near Taj Mahal.
- (xvii) Constitution of task force for development of Taj Heritage Corridor area by Archaeological Survey of India (ASI).
- (xviii) Approval of Rs. 167 crore project for upgrading civic amenities around Taj Mahal.
- 9. The Committee is aghast to note that no administrative setup has been constituted for TTZ Authority and as such no mechanism is available to implement the decisions of the TTZ Authority. As admitted by TTZ Authority, for all practical purposes TTZ Authority is not functioning optimally as it consists of only members with no supporting staff. Further, no budget is allocated for proper functioning of TTZ Authority. The Committee is at a loss to understand as to how the TTZ Authority, created to monitor progress of the implementation of various schemes for protection of the Taj Mahal and programmes for protection and improvement of the environment in the said area, has been functioning since its creation in 1999. The Committee, therefore, recommends that Ministry of Environment, Forest and Climate Change should provide the necessary financial support, manpower and infrastructure to the TTZ Authority without any further delay, so that it is able to effectively discharge its functions.
- 10. During the meeting of the Committee held on 10th January, 2015, the Committee was informed by the Director-General, Archaeological Survey of India that the main cause was dust particles on surface of the stones. They were regularly cleaning with human intervention and this practice effectively removes the superficial layer. As far as the stone surface, which is absorbing the pollutants in the porous surface, more effective measures were required to be taken. For that, effective preservative coating material may be identified and evaluated. Treatment of dome of Taj Mahal is under consideration because there are some problems for raising the scaffolding and the load bearing capacity of that portion was to be examined. The paper on it was yet to be published and it had given some conclusions.
- 11. Not satisfied with the presentations/submissions made before the Committee and to have first hand information on the spot, the Committee decided to visit Agra on the 10th and 11th April, 2015. At Agra, the Committee heard the representatives of Civil Society Originations/NGOs and industrial units, etc. on adverse effects of pollution on the Taj Mahal. A list of the members of NGOs/Civil Society present in the meeting held at Agra on 10th April 2015 and copies of representations received are at Annexure I & II. The following points were brought to the notice of the Committee during discussion:-
 - (i) Schemes to protect and improve environment in TTZ area were not being executed due to non-availability of Secretariat and required officers, engineers, scientists etc. and non-availability of budget and lapse of Central allocation for TTZ for want of matching budgetary provisions by the State Government.
 - (ii) Directions of the Supreme Court regarding tapping of two Nalas namely, Nala Mantola and Shamshan Nala still await implementation.
 - (iii) Construction of Agra Barrage and water supply of Agra barrage is yet to be completed to supply drinking water to the residents of Agra and to bring life to river Yamuna, which is next to the Taj Mahal.
 - (iv) A large portion of city waste/sewage (raw) is dumped in the river.
 - (v) Solid waste collection and disposal mechanism is totally inadequate.
 - (vi) Sewerage network covers only half of city area.

- (vii) Traffic congestion and jams remain the order of the day.
- (viii) Widespread encroachments on public land and green belts.
- (ix) Green belts, parks, gardens are dwindling fast.
- (x) About 24 major drains directly discharge effluents and sewage into the river.
- (xi) Two third of Agra Fort is occupied by Military personnel who take diesel vehicles inside the Fort and also cook food inside the Fort.
- (xii) Despite orders of Supreme Court, no action has been taken to stop the illegal expansion of factories which were emitting NO₂ sulphur, petro coke and did not comply with the pollution norms.
- (xiii) Representatives of Glass Manufacturer Associations stated that their manufacturing units were using natural gas which conformed with the specified pollution norms and therefore, ought not to be disturbed.
- (xiv) Thousands of cattle regularly bathe in what remains of river Yamuna & resultantly, the excreta from the animals is discharged in the Yamuna further polluting the surroundings of the Taj.

Measures taken

- 12. In the light of Committee's discussion on 10th January, 2015 in Delhi, the Ministry of Environment, Forests & Climate Change stated that following measures have been taken to protect the Taj from pollution:
 - Burning of cow dung has been banned in Agra and 8 FIR's have been filed against persons violating the ban imposed.
 - 62,592 plants on an area of 56.90 hac. have been planted in the vicinity of Taj Mahal during the last four years.
 - Cycle patrolling has been started by security officers responsible for Taj security.
 - Solar traffic signals have been installed at 13 important intersections of the major roads.
 - Construction on Inner Ring road joining Kanpur road to Gwalior road has already begun which will result in decongestion of major arteries of Agra and thereby reducing vehicular pollution.
 - To provide pollution free mass transport for the daily commuters Government of U.P. has appointed RITES Limited (under Ministry of Railways, Govt. of India) to conduct feasibility and DPR for Agra Metro Rail project. An agreement has already been signed between Agra Development Authority and RITES Limited on 26.03.2015.
 - A separate cycle track has been planned by Public Works Department for Fatehabad road and Shilpgram road to reduce vehicular movement around Taj Mahal.
 - Mathura refinery is gradually switching over to natural gas from 50% in the year 1996 to 58.8% in 2014-15. At present natural gas used is 58.8%, 27.8% refinery gas and remaining is furnace oil as fuel.
 - Four cyclone separators are being used by Mathura Refinery to reduce particulate matter.
 - Several punitive actions have been taken against persons selling coal to petha manufacturer and thereby forcing petha manufactures near Taj Mahal to shift to petha nagari in Kalindi Vihar.
 - A.S.I. is undertaking greening of barren land between Agra Fort & Taj Mahal.

- Parks have been developed by Agra Development Authority to increase green cover.
- 13. The Committee was further informed that air pollution has become a concern not only for health issues of common man but also for Cultural Heritage. There have been consistent efforts to minimize the impact of Air Pollution on Taj due to emitting gaseous and solid effluents from different sources like burning of fossil fuels, organic carbon and effluents coming from the industries. Air Pollutants may be divided into two forms namely Gaseous form like Oxides of Carbon, Nitrogen and Sulphur, and Solid form like Suspended particulate Matter (SPM) including Carbon and Dust.
- 14. Above two forms of Air Pollutants are liable to act on all types of building materials both physically and chemically and there are two ways of interaction of these pollutants with the building materials, namely Wet Deposition and Dry Deposition. Wet deposition is a process by which gaseous forms of pollutants react with moisture of the environment and get converted into acidic form but in very mild concentration. This acidic form is liable to react with the marble which is considered to be more prone to be attacked by these acidic forms and may induce corrosion of the stone.
- 15. The Ambient Air Quality Monitoring at Taj Mahal has indicated that the annual average concentration of gaseous pollution (SO2 & NO2) are within prescribed limit.
- 16. Dry deposition is comparatively less harmful if not charged heavily with the acidic components. An Action Plan has been prepared by Archaeological Survey of India to minimize the effect of chemical pollutants on Taj Mahal.
- 17. Regarding improvement of air quality of Agra city and control of pollution around Taj Mahal, various steps have been taken by different authorities for complying with the order of Hon'ble Supreme Court in writ petition (civil) no. 13381 of 1984 [Further in compliance of Hon'ble Supreme Court's order dated 05.04.2002 in W.P. No. 13029 of 195, the U.P. Pollution Control Board has prepared a comprehensive Action Plan which includes city gas network for vehicle/domestic sector/hotels/industries etc., installation of automatic traffic lights & signals at the main crossings of Agra City, massive plantation, phasing out of old vehicles, up-gradation of PUC system, by passing transit traffic, strengthening of air quality monitoring network, management of Municipal Solid Waste & Bio-Medical Wastes etc. the above Action Plan is under implementation & the progress is being reviewed by Taj Trapezium Zone Pollution (Prevention & Control) Authority/Govt. of U.P./MoEF&CC.
- 18. In addition, U.P. Pollution Control Board has prepared an 'Action Plan' while seeking the current progress of the implementation of projects completed, under progress and proposed environmental improvement of the industrial clusters of Agra City including Air, Water and land dimensions for overall improvement of Comprehensive Environmental Pollution Index (CEPI) which will certainly contribute towards the better environment & control of Pollution around Taj Mahal & other significant monuments. Taj Trapezium Zone Pollution (prevention & Control) Authority, Agra in its 32nd meeting held on 07.01.2015, following main decisions have been taken to reduce the pollution load in Taj Trapezium Zone (TTZ).
 - 1. To restrict the establishment of new gas based air pollution industries and increase in production capacity of old established industries with immediate effect.
 - 2. No concerned department like Zila Udyog Kendra, State Pollution Control Board, Gas Authority of India Ltd. and others can grant No Objection Certificate without prior permission from TTZ Authority to restrict transfer, diversification and capacity enhancement.

- 19. During the meeting of the Committee held at Agra on 10th April, 2015 the Committee enquired about the measures taken by TTZ Authority to reduce black and brown carbons. Through a power-point presentation, the Committee was informed by the TTZ Authority that the Authority had taken the following recent measures to reduce black carbon, brown carbon and dust particles:-
 - (a) Black Carbon
 - (i) Agra Metro rail approved, which will reduce number of private vehicles on roads
 - (ii) 6 new CNG filling stations to come up in 2015-16 (in addition to existing six)
 - (iii) Goods carriers prohibited from plying in Taj vicinity w.e.f. 1.1.2015.
 - (iv) Diesel/petrol goods carriers prohibited from city limits w.e.f. 1.8.2015.
 - (v) 12 km long bicycle track to come up in 2015.
 - (b) Brown Carbon
 - (i) Crackdown on petty manufacturing units still using coal as fuel-66 petha units sealed during past 3 months.
 - (ii) Ban on burning of cow dung cakes as fuel within city limits-28 FIRs lodged in past month.
 - (c) Dust Particles
 - (i) 62,592 trees planted in Taj Forestry block abutting Taj Mahal during last 4 years.
 - (ii) Greening of open space between Agra Fort and Taj Mahal being undertaken by ASI in 2015.
 - (iii) Agra Barrage announced by UP government on river Yamuna.
- 20. The Authority also apprised the Committee that it intended to take the following steps as part of its future plans to contain pollution in TTZ area:-
 - (i) 250, 000 more trees to be planted in 2015 and 2016 in TTZ by Forest Department.
 - (ii) Development of Agra as a SOLAR CITY by Agra Municipal Corporation.
 - (iii) Rules under preparation for battery operated three-wheelers (erickshaws) to eventually replace autos.
 - (iv) Dredging of Yamuna River to increase water pooling behind Taj Mahal.
- 21. The Committee takes note of the recent measures taken by the TTZ Authority and its future plans to reduce pollution in the area to minimize its adverse effects on the Taj Mahal. The Committee recommends that these measures should be implemented in true spirit and within a specified time frame through an interactive engagement between the State Government, Municipal and Central Government agencies. Effective steps should be taken by all the concerned authorities to ensure that the future of Taj as a symbol of India's cultural heritage is not hostage to environmental degradation.

AFFORESTATION ACTIVITIES

22. During its journey from Delhi to Agra by road, the Committee observed that there was no greenery/plantation on either side of the Yamuna Expressway. The representatives of civil society organizations/NGOs at Agra had also highlighted that green belts, parks, gardens were dwindling fast due to encroachment etc. The Committee,

therefore, sought to know the details of the afforestation activities undertaken in the TTZ area. The TTZ Authority informed the Committee that -

- (i) In Writ Petition (Civil) 13381/1984 MC Mehta V/s Union of India and others, Hon'ble Supreme Court in its order dated 11.04.1994 directed the Ministry of Environment and Forest, Government of India to develop a Green Belt around Taj Mahal.
- (ii) Plantation for development of green belt around Taj Mahal was done under a centrally sponsored scheme "Integrated Afforestation and Eco-Development Project (IAEO)-Taj Afforestation Project, National Afforestation and Eco-Development Board (NAEB), Ministry of Environment and Forest.
- (iii) Pursuant to Hon'ble Supreme Court's order 155850 plants on 142 hectare are reported to have been planted in the year 1995-96. (No of spots -33)
- (iv) In 1996-97, plantation of 22125 saplings on 15.6 hectare is claimed to have been achieved around Taj Mahal. (No. of spots-3).
- (v) In 1997-98 plantation of 52900 saplings on 33.172 hectare was claimed around Taj Mahal and in other nearby areas. (No. of spots-11)
- (vi) From 1995-96 to 1997-98 a total of 230875 plants were planted on 190.77 ha. under Taj Afforestation Project.
- (vii) Hon'ble Supreme Court in its judgment dated 30.12.1996 mentioned that "Green belt as recommended by NEERI has been set up around Taj. Pursuant to continuous monitoring of this Court, the Green Belt has become a reality."
- (viii) In 2011 plantation on an area of 56.90 ha. was done in Taj Forest Block abutting the Taj Mahal. Total numbers of plants is 62592.
- 23. In response to another query, the Committee was informed that different departments of the State Government had taken permission to cut trees to carry out some civil work. While passing the order, the Supreme Court had directed that more trees should be planted in lieu of those trees that were being cut. However, because of a conflict of opinion between the Union Ministry of Environment, Forest and Climate Change and State Forest Department, funds were not readily available for this plantation exercise. The matter was brought to the notice of Supreme Court as a result of which some officers of the State Forest Department had to face disciplinary action. The Committee was further informed that funds had now been released by the Union Ministry of Environment, Forests and Climate Change to the State Government and a programme has been chalked out to plants more trees during the next two years.
- 24. The Committee is of the view that planting trees is one of the most effective ways to combat air pollution. Deforestation and cutting of trees plays havoc on environment. The Committee, therefore, recommends that massive afforestation exercise should be undertaken by the TTZ Authority, which is not an expensive affair but can contribute a lot towards solving the problem of pollution plaguing the city of Taj. The TTZ Authority should also consider involving NGOs/local populace and private sector in the afforestation activities. The concerned authorities should also consider planting trees on the sides of the Yamuna Expressway. The Committee also recommends that the Union Ministry of Environment, Forest and Climate Change and the State Government should devise a coordination mechanism and ensure massive afforestation and plantation activities in the TTZ Area.

STUDY ON ENVIRONMENTAL MANAGEMENT PLAN

- 25. The Committee was further informed that TTZ Authority had initiated a study on Environmental Management Plan by National Environmental Engineering Research Institute (NEERI), Nagpur in December, 2013. Based on the in-depth analysis of air quality status and different sources of air pollution in TTZ area and also measures already implemented in the past in different sectors, management plan of improvement in air quality has been suggested by NEERI, Nagpur in "Environmental Management Plan of Agra/TTZ"(2013-14) in the following areas:
 - Industrial Pollution Control
 - Vehicular Pollution Control
 - Road Network and Traffic Management
 - DG sets
 - Other un-accounted Sources/activities
 - Strengthening of Air Quality Monitoring and continuous Assessment
 - Green belt development/ Massive Plantation
 - Awareness & Public Participation (Area/Ward/City Development Teams)
- 26. Based on the suggestions given by NEERI, the following projects have been formulated by different departments:-
 - 1. Construction of Inner Ring Road
 - 2. Widening of ROB on M.G. Road
 - 3. Upgradation/Infrastructure creation Project with following components:
 - (a) Upgradation of Inter-State Bus Station in Transport Nagar, Agra
 - (b) Workshop for long route buses in Guru Ka Taal
 - (c) Creation of Satellite Bus Terminals at Agra-Fatehpur Sikri Road, Agra-Gwalior Road, Agar-Kanpur Road.
- 27. The Committee was informed by the Ministry of Environment, Forest and Climate Change that based on the report of NEERI, the Ministry had identified 10 projects amounting to Rs. 220 crore and had submitted the same to the Government of Uttar Pradesh to approve them so that the Central Government could give 50% of the share for the implementation of the projects from a Centrally Sponsored scheme for the protection of the Taj. However, inspite of their having raised the issue at the highest level, the approval of the State Government to the projects is still awaited. However, the representative of the State Government expressed inability to provide their share for the projects due to the shortage of funds.
- 28. The Committee observes that the State Government of Uttar Pradesh has expressed its inability to provide funds for management plan of improvement in air quality in TTZ. The Committee is of the view that a project of national importance such as Taj cannot be allowed to suffer due to shortage of funds/want of matching contributions by the State Government the in providing the necessary financial assistance for the projects recommended by NEERI. The Committee feels that the Central Government should take the initiative to impress upon the Government of UP to contribute its share for the implementation of the projects to the extent possible and whatever shortfall is there, should be provided by the Central Government.

SOURCES OF POLLUTION

- 29. The Committee was informed by Ministry of Environment, Forest and Climate Change that major sources of pollution in Agra affecting the Taj Mahal were as under:
 - (i) Vehicular Pollution

- (ii) Emissions from Industry (Foundry, Petha, Electroplating, rubber, chemical & engineering industries)
- (iii) Gensets (used during power cut in hotels, industries, commercial establishments, houses, etc.)
- (iv) Burning of bio-mass, use of fuel in domestic sector.
- (v) Re-suspension dust (Road, open areas, transport from other areas etc.)
- (vi) Un-organized sector like sweet shops, restaurants, etc.
- (vii) Other activities (construction, stone cutting etc.)

MEASURES FOR REDUCING POLLUTION

Vehicular Pollution in Agra

- 30. Vehicular pollution has become one of the major sources of air pollution in the country and Agra is no exception to it. The Committee was informed that other than industries, vehicular pollution is the major factor affecting the Taj Mahal. As per the records of RTO, Agra total number of vehicles in Agra district have increased from about 4.0 lakhs to 6.4 lakhs in a span of 8 years (from 2003-04 to 2010-11) with an overall annual average growth rate of about 7.6%. In Agra district, about 7.45 lakh commercial and non-commercial vehicles were plying on road (as on January, 2013). Besides the movement of registered vehicles in the Agra and TTZ area, a large number of all categories of vehicles come from nearby states/cities like Delhi, Rajasthan, Madhya Pradesh and UP itself. Movement of all these vehicles for tourist as well as commercial activities also results in significant air pollution through vehicle exhausts. Movement of large number of vehicles in the TTZ area contributes not only to air pollution through the exhaust pipes but also due to their movement on roads. Further, re-suspension of road dust in large quantity also contributes to the total particulate matter (SPM/PM₁₀).
- 31. The Committee sought to know the steps taken to reduce vehicular pollution and to overcome the problem of traffic congestion by the different authorities in Agra. The Committee was informed by TTZ Authority that the following steps had been taken by different authorities to contain the effects of vehicular pollution on the Taj Mahal and to overcome the problem of traffic congestion:-
 - (i) Construction of Inner Ring road joining Kanpur road to Gwalior road has already begun which will result in decongestion of major arteries of Agra and thereby reducing vehicular pollution.
 - (ii) To provide pollution free mass transport for the daily commuters, Government of Uttar Pradesh has appointed RITES Limited (under Ministry of Railways, Government of India) to conduct feasibility and DPR for Agra Metro Rail Project. An agreement has already been signed between Agra Development Authority and RITES Limited on 26.03.2015.
 - (iii) A separate cycle track has been planned by Public Works Department for Fatehabad road and Shilpgram road to reduce vehicular movement around Taj Mahal.
 - (iv) Restriction of plying of Petrol, diesel driven vehicles around 500 meter of Taj Mahal.
 - (v) Plying of Battery operated Buses and other vehicles within 500 meter of Taj Mahal.
 - (vi) Fixation of age for public and commercial vehicles
 - (vii) No new registration of age barred vehicles
 - (viii) Supply of CNG for vehicles at Agra

32. The Committee feels that increased vehicular traffic in Agra is becoming a huge source of pollution and is one of the factors adversely affecting the Taj Mahal. The Committee notes the steps taken by the Government to contain vehicular pollution and recommends that measures taken should be implemented strictly to obviate any relaxation so that the beauty of the Taj could be saved.

Industrial Pollution

- 33. Industrial pollution is yet another major source of pollution in the TTZ area which is adversely affecting the Taj Mahal. Ministry of Environment, Forest and Climate Change identified the following main sources of industrial pollution:
 - (a) The major air polluting industries in Agra include Cupola, Induction furnace, Rubber, Chemical and Engineering industries, which are currently using electricity; CNG supplied by GAIL and are reported to comply with the standards laid down by MoEFCC. Appropriate air pollution control systems (APCS) have been installed in these air polluting units.
 - (b) There are about 194 (190 glass industries + 4 Pakai Bhatti associations) glass based industries manufacturing mainly glass bangles, glass beads, glass rods, glass tubes/shell, glass wares and glass blocks in TTZ area of Firozabad. DG sets are installed in almost all the glass industries in Firozabad District, which are mostly based on natural Gas.
 - (c) Mathura Refinery is one of the major industries in Mathura. Besides, there are other small & medium scale industries in the region.
 - (d) Due to proximity to Keoladev National Park, industries could not be developed in Bharatpur Region. Presently, Perfect Sanitary Pipe and other small and medium scale industries manufacturing/producing agricultural equipments, tin container, animal fodder etc. are operating in Bharatpur. For systematic industrial development, Rajasthan Industrial Development and Investment Corporation (RIICO) was established in 1984. However, industrial development in the region is yet to be achieved.
 - (e) Apart from the organized sectors there are a large number of small scale/cottage/household activities which contribute towards air pollution. In Agra, besides foundries, there are petha (sweet item) manufacturing units and also more than 2000 halwaiis, 500 kumhars and bharbhujas which use coal, cow dung, wood and agro-wastes.
- 34. The Committee was further informed that some steps taken for control of industrial pollution were as under:
 - (i) Use of natural Gas as fuel in Industries. A dedicated network has been created by Gas authority of India.
 - (ii) 'PNG is being supplied to some residential/commercial areas. Expansion is planned in phased manner.
 - (iii) Adequate supply of LPG has been ensured for domestic use.
 - (iv) Encouraging petha/bangles micro units to switch from coal to LPG/CNG and shifting to designated areas.
 - (v) Setting deadline of 31.7.2015 for converting small commercial vehicles (loaders) to CNG.
 - (vi) Prohibition of the expansion of existing gas based industries.
 - (vii) Providing instant gas connections as incentive.
- 35. In response to a query as to whether the chemical pollutants from industries in and around Agra were affecting the Taj Mahal adversely, the Committee was informed that the polluting industries in and around Agra are equipped with air pollution control

devices. The industries were operating on CNG or electricity. Further, the Ambient Air Quality Monitoring at Taj Mahal has indicated that the annual average concentrations of gaseous pollution (SO2 and NO2) are within prescribed limit.

- 36. The Committee notes with concern the sources of industrial pollution in TTZ Area, which have been adversely affecting the Taj Mahal. The Committee recommends that Government should look into the allegation of illegal expansion of factories which were emitting NO2, sulpher and petro coke and did not comply to the pollution norms, in violation of the orders of Supreme Court and take not only necessary punitive action but preventive measures too against such industries. The concerned authorities should also ensure that air pollution control systems (APCS) are installed in these air polluting units. The Committee also recommends that the Government should not only encourage the industries, including the petha and bangle units, to shift to designated areas but also facilitate their efforts to shift to new places. Pollution due to use of DG Sets
- 37. One of the important directions of the Hon'ble Supreme Court regarding protection of Taj Mahal was to ensure uninterrupted electricity supply to the Taj Trapezium Zone. However, the Committee was informed by the representatives of civil society organizations/ NGOs that irregular supply of electricity in the region forces the consumers to use DG sets for commercial as well as domestic purposes and the use of DG Sets in whole TTZ area, especially in Agra, is considered as a major source of air pollution. DG sets are installed in almost all the glass based industries in Firozabad district. These DG sets are operated with natural gas. DG sets are also deployed as alternative electricity source in many Health Care Facilities (HCFs), which include all types of hospitals, nursing homes, clinics, pathological labs, etc. DG Sets are also installed in some commercial places such as banks and hotels. In Mathura also, DG Sets are installed in Industries and commercial/residential premises like schools, hospitals, complexes and hotels, etc.
- 38. Since 24 hour electricity to TTZ area was one of the directions of the Supreme Court, the Committee enquired from the TTZ Authority as to whether the directions given by the Hon'ble Supreme Court were being complied with by the TTZ Authority. The Committee was informed that nearly all the directions of the Supreme Court had been implemented. However, as regards uninterrupted power supply to TTZ Area, the directions had not been fully implemented. Since there was a shortage of electricity in Uttar Pradesh, the TTZ was getting about 18-19 hours of electricity every day, which, however, was much better than many other districts of Uttar Pradesh.
- 39. The Committee is of the view that use of DG sets in TTZ Area is one of the major sources of air pollution, which has been adversely affecting the beauty of the Taj. The Committee recommends that the Government of Uttar Pradesh must make all out efforts to implement the direction of Hon'ble Supreme Court regarding 24-hour power supply to the TTZ area so that the use of DG sets is avoided and its adverse impact on the Taj Mahal be minimized.
- 40. The Committee feels that by not fully implementing the Supreme Court direction of 24 hour electricity supply to the TTZ, the TTZ Authority was making itself liable for contempt of Supreme Court. The TTZ Authority has also not sought any exemption from the Supreme Court in this regard. The Committee therefore, recommends that in order to avoid contempt of Court, the TTZ Authority should approach the Supreme Court and highlight the constraints in providing 24 hour

power supply in TTZ areas and seek an amendment of the direction issued in this regard, till such time they are able to provide 24 hour power supply in the area. Pollution from Cremation Ground

- 41. Attention of the Committee was also drawn to a cremation ground in Agra which was also a source of pollution affecting the Taj Mahal. The Committee desired to know as to whether any steps had been taken by the concerned authorities to shift the cremation ground. Chairman, TTZ Authority informed the Committee that the cremation ground was located close to the Taj Mahal and it had been there for hundreds of years. To shift it from there was a challenging task. However, a new electric crematorium had been built next to the traditional cremation ground and they had been trying to persuade the people not to burn the dead in the traditional manner but to use the electric crematorium. He further stated that it was not easy for the people to change their traditional rituals.
- 42. The Committee is of the view the cremation ground close to the Taj Mahal adversely affects the Taj Mahal. The Committee recommends that there should be no let up in the efforts of the Government to shift the cremation ground and to make people understand to switch over to the electric crematorium to burn their dead in an eco-friendly manner to save the Taj from its adverse effects.

Treatment of Solid and Liquid Wastes

- 43. The Committee was informed by the representatives of civil society organizations/NGOs that a large portion of city waste/sewage goes into the river Yamuna untreated. Further, solid waste collection and disposal mechanism is inadequate and sewerage network covers only half of city area. The Committee desired to know as to what steps had been taken to ensure that the debris and sewerage of the city were being disposed off. The Committee was informed by the Municipal Commissioner, Agra that 9 Sewerage Treatment Plants have been constructed to treat the sewerage flowing into Yamuna, one out of which was under construction. Total capacity of these STPs were 220.50 mld. However, some of the STPs were old and were not working to their full capacity. Attention of the Committee was also drawn to the bathing of buffalos etc. in the water bodies around the Taj Mahal.
- 44. The Committee is of the view that degradation of Yamuna bed is quite evident and is visible to the naked eye. The Committee is unhappy to note that not only the capacity of the sewerage plants inadequate but some of these plants are not functioning to their full capacity or have to run on DG sets. The Committee recommends that steps should be taken to strengthen the management of solid and liquid municipal waste infrastructure in the Agra city. The Committee also recommends that the concerned authorities should ensure that there is no dumping of solid or liquid waste from within the municipal limits of Agra into the Yamuna bed, without requisite treatment. The effluents related to waste water and sewage surrounding the Taj Mahal should be properly treated before its discharge in the designated areas. Necessary steps should also be taken to stop the bathing of buffalos/animals in the river Yamuna/water bodies around the Taj Mahal immediately.

Construction of Yamuna Barrage

45. The Committee observed that the situation of water in Agra was not good and that the Yamuna behind the Taj Mahal had become dry. The Committee enquired about the steps taken to improve the water supply in Agra and construction of Yamuna Barrage. The Committee was informed by the Chairman, TTZ Authority that Okhla barrage in Delhi was built by the British in 1874 to divert water for irrigation through Agra canal. Since then Yamuna had been dry in Agra. He further stated that the Minister of

Irrigation, Government of UP had seen the same and announced that a small dam will be constructed at a small distance downstream the Taj Mahal to stop the water so that there could be a water pooling behind the Taj. The Committee wondered as to how the Government of Uttar Pradesh intended to have water flown to the periphery of the Taj Mahal.

46. The Committee is of the view that the Taj Mahal is losing its sheen because of lack of water body behind it. The Committee feels that construction of the Agra Barrage can permanently solve the water crisis of the city and also give a very scenic view of the Taj Mahal to the tourists. However, how and from where water will come to Agra has to be explored. The Committee has been given to understand that no survey has been conducted so far to try to explore the potentialities of water in the region. The Committee, therefore, recommends that a survey should be undertaken for mapping the sources of water in the TTZ area at the earliest. The Committee also recommends that the Government should explore all probable options including consulting Union Ministries of Water Resources and Irrigation to devise a mechanism to have water flown into at least in the periphery of Taj Mahal.

Pollution from Leather Factories

- 47. The Committee observed that leather factories were polluting the river Yamuna in Agra and desired to know the steps taken to contain the same. The Committee was informed by the UP pollution Control Board that there was only one tannery and that was equipped with Effluent Treatment Plant (ETP) and industrial effluent was not directly discharged into river Yamuna.
- 48. The Committee is of the view that leather tanneries have a huge polluting effect. Although the Committee has been informed that the only leather factory in Agra is equipped with Effluent Treatment Plant, the Committee suggests that Government should ensure that the leather tannery at Agra does not have any adverse effect on river Yamuna.

ROLE OF ARCHAEOLOGICAL SURVEY OF INDIA

- The Committee also sought the comments of the Archaeological Survey of India on the findings of the two scientists from Indian Institute of Technology, Kanpur. The Committee was informed by the Archaeological Survey of India that air pollution has always been a concern as far as conservation and preservation of the Taj Mahal is concerned. Since the setting up of Mathura Refinery, many scientific institutions including NEERI have carried out studies on this aspect. The Mathura Refinery was set up in 1982. As a result of concerns from experts and scientists regarding the possible emission of Air Pollutants and its impact on Monuments, a writ petition (C) No. 13381 of 1984 was filed by Shri M.C. Mehta in the Supreme Court in 1984 against Union of India and was called for hearing by the Supreme Court. Since then a number of suitable measures have been taken to limit the pollution level in the vicinity of Taj Mahal. On January 19, 1998, the Hon'ble Supreme Court passed an order for setting of continuous Ambient Air Quality Monitoring Station by ASI in the premises of Taj Mahal. In pursuance of Hon'ble Supreme Court's order dated 24th March 1998, the monitoring Station was shifted from N-W burj to N-E burj of Taj Mahal. At present three stations are being run by the ASI, CPCB & the UPPCB respectively.
- 50. ASI further informed that some problems still persist due to operation of generator sets around Taj Mahal during power cut. A cremation ground close to North West Burj of the Taj Mahal may also be responsible for pollution due to burning of Bio mass. Vehicle load around the Taj Mahal may be considered another source of pollution.

- 51. News items and the related published article reported the outcome of the monitoring and studies conducted on the marble sample for two months. Deposition of Black carbon and Brown carbon along with dust may interfere with the refractive index of the clean polished marble surface due to their light absorbing properties but this is only a surface phenomenon and may be easily cleaned with regular intervention. As such, level of SPM and Dust pollution may vary from time to time depending upon the local climatic conditions and other parameters. Gaseous pollutants are under control. An air pollution monitoring lab is also monitoring the ambient air quality and accordingly Northern Zone of Science Branch takes regular preventive measures to minimize the effects of dust pollution and higher SPM level on marble and other building materials. To achieve this objective, periodical cleaning is being carried out on different structural members of the Taj Mahal using effective but safe methods. This minimizes the possibility of chemical interaction of pollutants with building material. It has also been submitted that the cleaning method in practice effectively removes the superficial loose inert surface deposits. It may not be effective for the cleaning of hard crust or the encrustations developed on the marble due to chemical interactions or mineralogical transformations. Since Marble is a hard stone having very low porosity, a preservative coat may not be effective to protect the surface from the adverse effects of possible impact of air pollutants. However this aspect is under consideration so that a safe yet effective preservative coating material may be identified and evaluated for its use. Treatment of Main dome of the Taj Mahal is under consideration.
- 52. The Committee desired to know from the Archaeological Survey of India as to why after spending so much of money, deposition of light absorbing particulate matter is causing substantial discolouration of the Taj Mahal. The Committee also asked Archeological Survey of India to submit a report stating factual position with definite time lines regarding the scientific conservation of Taj Mahal. Thereafter the ASI forwarded an Action Plan to mitigate the yellowing of the marble of Taj Mahal (Annexure-III) which provides a phasewise action plan for the scientific conservation of Taj Mahal.
- 53. When asked about the steps taken to reduce discolouration of Taj Mahal, the ASI stated that they had installed Air Pollution Monitoring Station in the premises of Taj Mahal that continuously monitors the ambient air quality in the vicinity of Taj Mahal and the effects of pollution on Taj. ASI also undertakes cleaning of marble surfaces of Taj through chemical treatment of the façade using very safe conservation measures. At present, Clay Pack method is being used very effectively to remove harmful surface deposits from the marble surface and to maintain the aesthetic beauty of the Taj Mahal. This method is considered very safe as it involves minimal use of chemicals and almost no mechanical efforts.
- 54. The Committee visited the Taj Mahal complex on the 11th April 2015. The Committee observed that damage had been caused to the Taj Mahal over a period of time. The Committee inspected the conservation work being carried out by Archaeological Survey of India and was of the view that the repair/conservation work at the Taj Mahal was not satisfactory. The Committee also observed that the interiors of the circular rings on the minarets had become dirty and turned blackish. Further, the interiors of the mausoleum, including the chambers of the inner dome and floral panels had become dirty and required scientific cleaning.
- 55. The Committee is of the view that increased pollution is taking a toll on the Taj Mahal. The sorry state of affairs at Taj Mahal clearly indicates that concerned authorities have failed to devise a co-ordinated action plan to fully comply with the

orders of the Supreme Court and to discharge their duties with regard to preservation of the Taj. Although some steps have been taken in this direction, a lot more needs to be done within a specified time frame. The Committee recommends that the Archaeological Survey of India should take urgent remedial measures for completion of works at the site. The Committee also recommends that the Archaeological Survey of India should explore the possibility of utilizing the expertise of foreign experts, if required, for the conservation/preservation of Taj Mahal. Further, the Archaeological Survey of India should prepare a holistic and comprehensive action plan for the protection and conservation/preservation of Taj Mahal, to be implemented within a time bound manner.

CONCLUSION

- 56. The Committee is of the view that Taj Mahal is a symbol of India's national pride and heritage and a multi-pronged strategy is required to address the challenge of preserving the pristine beauty of this world famous historic monument. The Committee, therefore, recommends that all concerned Central and State Government agencies and the public at large should come together and work in coordination with each other to reduce the pollution level in TTZ and to ensure that the glory and beauty of Taj Mahal is restored not only for today but for years, decades and centuries to come. The Committee further recommends that the orders of the Hon'ble Supreme Court on whole are faithfully implemented in letter and spirit and in case any clarifications/modifications are required with regard to the directions/orders issued by the Hon'ble Supreme Court, a suitable application for the same may be made before the Court.
- 57. The ASI has submitted an interim Action Plan for preservation of the Taj. The Action Plan should be strictly implemented and a monthly progress report is submitted to the Ministry of Environment, Forest & Climate Change in this regard until all the actions proposed in the said plan have been fully implemented.

Annexure 2.11: Recommendations as per MoM with Stakeholders on 04-01-

2018.

- 1. To control the number of tourists coming to Taj on daily basis.
- 2. Sufficient staff for successful development in TTZ Region.
- 3. Decrease in Pollution: Development of Ring Road around Agra and setting up of Barrage Foundation should be done ASAP.
- 4. Land between the road and footpath within the range of 10KM of Taj Mahal should be covered with Green layer.
- 5. Increase in number of Monitoring Stations from 6 to 18 for future monitoring.
- 6. A different category should be made in pollution index for TTZ region.
- 7. To reduce the long term construction work, NHAI should be time bound for construction work in TTZ Region.
- 8. Afforestation: Tree Transfer Machine should be used for transferring the trees from TTZ Region to some other area.
- 9. Traffic Pollution: Toll tax Plaza to be removed from TTZ Area.
- 10. Solid Waste Dump Yard should be covered completely.
- 11. Developing Agra into an Electronic City.
- 12. Immediate out sourcing arrangement of garbage collection and disposal.
- 13. All drain water into Yamuna through Natural Filtering Plant.
- 14. Ground water Recharge: Construction of Rubber Barrage on Yamuna River in Vrindavan and Sikandra. Dam on Kiwar River for Ground water recharge and Irrigation purpose. Dam on Chambal River near Penahut.
- 15. Rejuvenation of Kittham wetland to attract tourist and supply of drinking water in Agra.
- 16. Using Wet Land Technology in polluted drain we can rejuvenate ground water at low cost.
- 17. Restoration of Chikasana Dam.
- 18. Declaration of Yamuna Flood Plane in TTZ as Eco-Sensitive Area.
- 19. Set up the "Special Environmental Development Authority".
- 20. Review of the building laws for restoring Low Density Residential Area in TTZ.
- 21. Biodiversity Mapping of TTZ.
- 22. Create Sustainable Habitat as "Eco-Village".
- 23. Eco-Friendly Habits: Zero waste, Banning of Polythene
- 24. Targets likely to be fixed for control of emission on 2-3 basis for next 10 years.
- 25. Integration of Development Program in TTZ.
- 26. Introduction of a guideline for Construction Industry.
- 27. Development of wetland along the upstream and downstream of Yamuna River in Sikandra to rejuvenate the environment.
- 28. Tree Plantation: 250 ha. Along the Yamuna River side at ward level, 2000 ha. Unused low lining Forest Area (in further 5 years).
- 29. Use of CNG/ Natural Gas instead of diesel or petrol.
- 30. Mechanical process of Road Cleaning.
- 31. Green Cover should be provided at construction.
- 32. Permanent Pavement and Improved Traffic Management System.
- 33. Provision of electricity for 24 hours daily in the area to avoid use of DG Set.

- 34. Development of electric crematorium.
- 35. Providing CNG Pump along the Petrol/ Diesel Pump.
- 36. Dust Controlled System should be installed during development of the site in TTZ Area.
- 37. One Care taker for 500 trees.
- 38. Study on Natural Resource available.
- 39. Air Pollution Control System in Firozabad.
- 40. Air Purifier near Taj Mahal.

Annexure 2.12: Carrying Capacity Based Planning for Cities – Concept and Procedure

Carrying Capacity Constituents of an Urban Area						
ENVIRONMENTAL	COMPONENTS DEFINATION AND CARRYING CAPACITY					
COMPONENTS/ RESOURCES	GOALS					
Assimilative Capacity Dimension						
Air Environment	Local Air shop – Substance of Air Quality Parameters					
	within acceptable limits therein					
Water Environment	Local Ground and Surface Water Regimes - Substance					
	of Water Quality Parameters therein within acceptable					
Land/Soil Environment	limits					
	Urban land and Soil regime – Substance of productivity					
Biological Environment	and Use Values therein against Land pollution					
	Local Ecosystem and flora and fauna – Sink Potential					
Acoustic Environment	and Recycling Capacity therein against Pollution Loads					
	Urban Landscape – to attenuate Outdoor Noise Levels					
	to acceptable limits					
Supportive Capacity Dimension						
Urban Land and Shelter Resource						
- Land	Land Supply within and around Urban Areas to support					
	Population and Activities in terms of acceptable					
- Housing	density norms.					
	Urban Residential Space – Its Quantity and Quality to					
- Social Amenities	support Needs and Demands of Population Groups					
	Urban Health, Educational, Recreational and Public					
Urban transportation and	Security Services – Quality and Quantity in terms of					
Communication Infrastructure	acceptable norms					
- Regional Accessibility						
	Road/ Rail/ Air/ Water Linkage and Services between					
	Urban Area and Other Population and Economic					
- Intra-Urban Accessibility	Center to support Adequate and Efficient Movements					
	of Population Groups					

- Communication Facility	Urban Road and Transportation Facilities – to support				
	Adequate and Efficient Movement of Population and				
Urban Utilities	Goods across Different Parts				
- Water Supply	Post, Telegraph, Telephone and Other Communication				
	Facilities of Urban Area – to support Adequate and				
	Efficient Communication Within and Outside				
- Sanitation					
	Water Resources and its Delivery System Across Urban				
- Energy	Areas to have adequate and affordable supply in				
	terms of acceptable norms				
	Sewage, Storm Drainage and Solid Waste				
Human & Institutional Resource	Management – Adequate and Hygienic Disposal in				
- Manpower	terms of acceptable norms				
	Electricity and Non-Conventional Energy System –				
- Urban Economic Base	Adequate and Affordable generation and distribution				
	Supply to meet Peak Hour Demands and Households				
	Establishments and Public Streets and Open Space				
- Urban Local Bodies					
	Manpower Supply in Urban Area – to have Adequate				
Co	Quantity and Quality for Sustained Economic				
	Development				
	Industrial, Commercial and Service Activities of				
	Organized and Non-Formal Sector to have adequate				
	Employment, Income and GNP generation				
	Urban Municipalities and/or Development Agencies to				
	have Adequate				
	and Human Resource and Legal / Political				
	Empowerment for				
	Development and of Urban Environmental				
	Infrastructure in terms of				
	acceptable norms				

Table 2: Suggested Carrying Capacity Indicator of an Urban Area for Intra-Urban

Accessibility

IN	IDICATOR		NOTES ON INDICATOR MEASURE
1. Roa	d Area as	-	A general measure of capacity for road
perd	entage Urban Land		movement
Area	(in SqKms/Ha)	-	In the absence of any substance of any
			standard, comparison with other urban areas
			indicate relative capacity
2. Roa	d Length (surfaced)	-	Published information on urban road lengths
in Kı	ns		are useful surrogates in the absence of data on
2.1	oer SqKms/Ha of		road widths or areas
	Urban Land		
2.2	per 1000 Urban		
	Population		
3. Roa	d Right of Ways in	-	Traffic flow capacity across different parts of an
Mt.,	Lane Nos.		urban area depends on the extent , hierarchy,
(cun	nulative) of different		connection and ROW of the road network
func	tional hierarchies	-	Public Works Department, Municipalities, Town
3.1	Arterial		Planning Organizations, etc., are important
3.2	Sub-arterial		source of information
3.3	Collectors	-	Surrogate indicators: Peak Hour Traffic Volumes
3.4	Access Roads, etc.		may surrogate actual Capacity and indicate
			differences with designed capacities
4. Pub	ic Transport	-	MRTS capacities to be assessed separately
Cap	acity Products of		whatever applicable
Bus,	Rail, Tram, etc.	-	Idle capacity given by the difference between
Rou	es, Frequencies per		designed and operating Roots, frequencies, etc.
Rou	e and Capacities		to be considered
(sea	ts) per unit	-	Except for large Indian cities with local bus
			services, regional buses serve local passengers
			in most cities
5. Jour	ney Speed on	-	Indicates congestion/ stress on road capacity
Ave	age in Peak Hours	-	Speed and Delay Surveys on major arterial along
betv	veen City Center and		different directions from city center or major
Peri	pheries in kmph		activity zones may be helpful in this indicator
5.1	By Bus		measure

	5.2 By Car		
(Stress	Indicator)		
6.	Traffic Accidents: Gross	-	Accidents indicate stress on capacity through
	and Fatal Cases per year		congestion and conditions of road designs and
	6.1 per 1000 vehicles		traffic regulations
	6.2 per unit road length		
(Stress	Indicator)		
7.	Registered Vehicle	-	Vehicle density may surrogate or be compared
	Density		with designed capacity in PCU of urban road
	7.1 per unit road length		network
	7.2 per unit population	-	Vehicle registration data are generally
(Stress	Indicator)		aggregated at district/ sub-district rather than
			urban area level in India
		-	Urban roads may carry vehicles registered in
			other places
8.	Public Parking Space in	-	Availability of parking space will indicate
	sqm. as percentage of		carrying capacity for vehicle use in urban area
	Total Allowable Floor		
	Area in the Central		▼
	Business District		

Annexure of Chapter 3

Annexure 3.1 – Issues at Regional, City and Precinct Level

3.1 INTRODUCTION

The Taj Trapezium Zone (TTZ) is a 10,400 sq. km area around the Taj Mahal, comprising of five districts of Uttar Pradesh and parts of two districts of Rajasthan. The TTZ has been declared as an "Air Pollution Protected Area" (MoEF, GoI in 1983), due to the presence of world's beautiful monument the Taj Mahal. The TTZ comprises about 40 protected monuments including three World Heritage Sites - the Taj Mahal, Agra Fort and Fatehpur Sikri. The zone also covers many unprotected and unidentified heritage sites which links India with its glorious history. It is a global tourism destination area and offers huge development potentials with respect to tourism, heritage and tourism-centric city economy. TTZ is so named since it is located around the Taj Mahal and is shaped like a trapezoid¹.

3.1.1 The Region

Located on the Yamuna Basin and being part of the Braj Corridor, the Taj Trapezium is bounded by Longitude 77°15′E on the West, 78°30′E on the East and lines joining Latitude 27°45′N to Latitude 27° 30′N on the North and Latitude 26°45′ to 27° 00′N in the southern part of the zone.

Location: The TTZ area comprises of five districts in Uttar Pradesh – Agra, Mathura, Firozabad, Hathras and parts of Etah Districts and Bharatpur district in Rajasthan. There are about 120 cities and towns apart from villages that fall within this zone and can be classified between the class I and class VI categories of census cities and towns. There are eight class I cities, five class II cities and about twenty-four class III cities as per census 2011. The population growth pattern shows an increase in all the cities growth rate over the decades (Fig 1).

¹ Parliament of India Rajya Sabha, Department-Related Parliamentary Standing Committee On Science & Technology, Environment & Forests, Two Hundred Sixty Second Report On Effects of Pollution on Taj, July 2015

POPULATION GROWTH (a) Agra (M Corp.) (b) Agra (CB) 4000 Fatehpur Sikri (NPP) 15386.0891 Mathura UA 3500 (a) Mathura (NPP) 14000 i 12638.2223 (b) Mathura (CB) 3000 Vrindavan UA 12000 (a) Vrindavan (NPP) Govardhan (NP) 10000 8058.4443 Firozabad (NPP) 2000 8000 Tundla UA 6455,522 (a) Tundla (NPP) 1500 6000 Shikohabad (NPP) 4165.633 ■ Hathras UA 1000 (a) Hathras (NPP+OG) (i) Hathras (NPP) 500 Bharatpur UA (a) Bharatpur (M Cl+OG) 2001 2011 2018 (i) Bharatpur (M CI) Total Population POPULATION PROJECTION TOTAL POPULATION

Figure 1: Population Growth and Projected Population based on Trend of few Selected Cities in TTZ

Source: Census 2011 and Trend based Projected Population till 2050

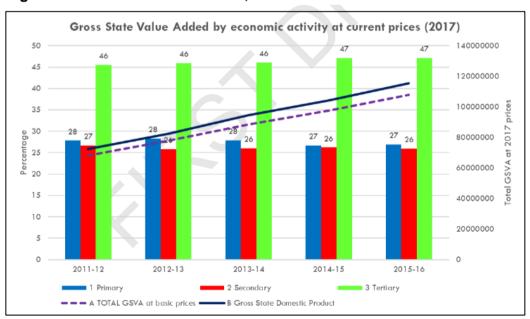


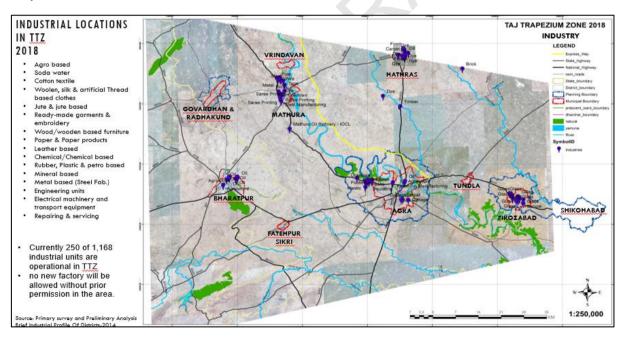
Figure 2: Gross Domestic Product, 2017

Source: NITI Ayog 2017

Demography: The socio-economic profile of the cities shows that about 70% of the population is literate while 30% being illiterate (census 2011). More than 65% of the population are in the non-working group while 30% are in the working group and about 5%

are marginal labourers 2. The number of non-workers are more because either the female workforce is not engaged in any kind of occupation and/or mostly the work force is engaged into agricultural activities and/or it is an aged population that is mainly residing in the region.

Economic Profile: An average growth rate of state gross domestic product (GDP) in Uttar Pradesh (UP) shows that the contributions from the tertiary sector to the GDP is followed by the secondary and primary sectors (NITI Ayog 2017). TTZ is centrally located and has close economic links with the northern and central part of India. As a global city, Agra is strategically located and well-connected by transportation linkages as a regional gateway for tourism, trade and services to and from India and rest of the world. Closure of a number of industries and restrictions on the industrial development in the region shows a stagnation in the growth trends in the secondary sector. The region is well connected with roads and railways and with the Agra expressway the connectivity linkages with the cities the region has further been strengthened. This will foster greater social and economic interactions and economies of scale of the TTZ region.



Map 1: Industrial Locations in TTZ, 2018

Source: Brief Industrial Profile of Uttar Pradesh 2014, Primary Survey 2018 and Preliminary Analysis

Industrial Profile: Uttar Pradesh, a state with an access to a robust industrial infrastructure, has 15 industrial areas, 12 specialized parks, four growth centres and Industrial Infrastructure Development Centers (IIDC). Under central government scheme, various integrated industrial development centers have been developed so as to boost the development of

² Census 2011

micro small and medium industries at Etah, Banthar (Unnao), Kosi Kotwan (Mathura), Kursi Road (Barabanki) and various other places, most of which is in and around the TTZ Region.³

Irrigation Canals in TTZ: Uttar Pradesh has about 3,091 thousand hectares under canal irrigation which is 30.91 per cent of the total canal irrigated area of the country. Over one-fourth of the net irrigated area of the state is irrigated by canals. Agra Canal is the main source of irrigation in Taj Trapezium Zone Region. Following are the main canals in the state of Uttar Pradesh.

- 1. Upper Ganga Canal
- 2. Lower Ganga Canal
- 3. Sharda Canal
- 4. Eastern Yamuna Canal
- 5. Agra Canal

Source: Bhrean 2018 and Preliminary Analysis, Canals Irrigation in India by Propy Manual (Verw yourself-distance)

Map 2: Water Canals in the TTZ Region

Source: Canal Irrigation in India, Pooja Mondol; Bhuwan 2018; Primary Survey 2018 and Preliminary Analysis

Physical Infrastructure Status – The TTZ is well connected with roads and railways with other regions in India. The region is well served with the supply of water and electricity. Under development programs like the Jawaharlal Nehru National Urban Renewal Program

³ Infrastructure Development in Uttar Pradesh – 2015, Prof. S.V. Pathak, Dr. Rajeev Prabhakar and Dr. Sandeep Kumar Gupta, XVII Annual International Seminar Proceedings; January, 2016

(JNNURM), AMRUT, RAY, Affordable Housing scheme, Shwatch Barat Mission and now the Smart Cities projects, urban areas in Uttar Pradesh have been benefiting and the development is in progress in most of the cities. A brief on the infrastructure status is given below:

Water Supply: The infrastructural provisions in the region shows that 65% of the domestic households are not connected with tap-water from treated sources and are therefore depended on the ground water sources like bore-wells, hand-pumps, etc.⁴

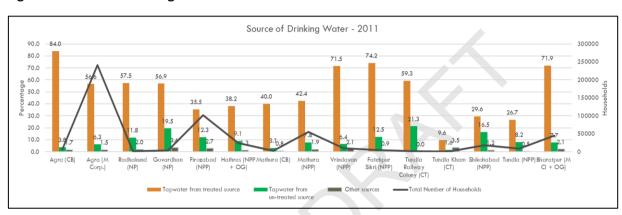


Figure 3: Source of Drinking Water

Source of Electricity: Averagely about 92% of the households are provided with Electricity from legal connections while the percentage share of the other connections is very less. Though there are power connections, the region faces frequent power cuts and therefore the use of alternative fuel sources is very high in the region.⁵

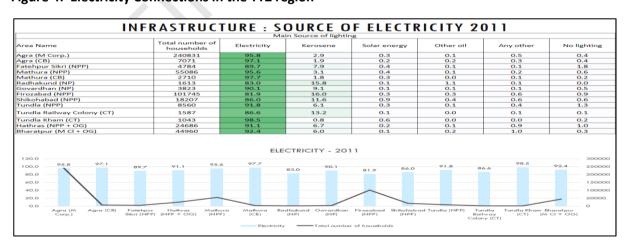


Figure 4: Electricity Connections in the TTZ region

⁴ Institute of Social Sciences, India 2011

⁵ Institute of Social Sciences, India 2011

Toilet Facilities: As per the toilet facilities available, it is observed that on an average 90% of the households in the TTZ region have toilets within premises. This was well observed in the field. About 10% of the households defecates in open area while Dhanauli, Dhaulpur, Bharatpur has highest open defecation rates⁶. But it is assumed that with the Swatch Bharat Mission, there can be changes in this situation

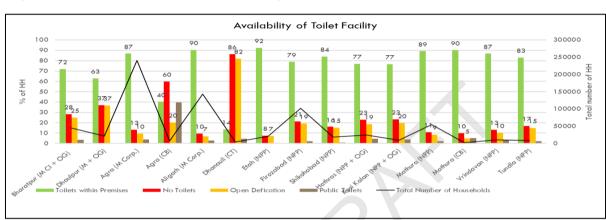
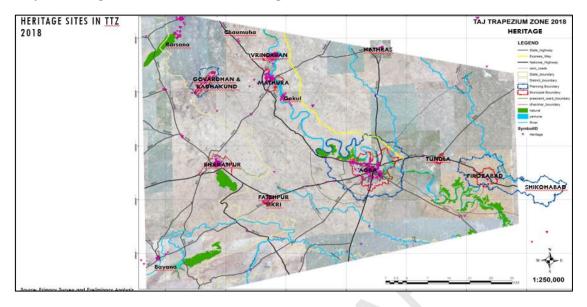


Figure 5: Toilet Facilities in the TTZ Region

Tourism: The UP Government envisioned "Uttar Pradesh Pro Poor Tourism Development Project" with the financial support of World Bank is one of the stepping stone in restructuring its tourism sector in a pro-poor manner. This has been mandated with a view to increasing benefits to local communities and improving the management of its tourism destinations. The Pro- Poor Development Project focus on two main regions- Braj-Agra Corridor and the Buddhist Circuit; covering in all 12 destinations of high heritage and tourism significance. Among these, the subproject sites for 1st year has been identified along Braj – Agra corridor namely Agra and Vrindavan (Mathura); as these cities depend heavily on tourism but it has had minimal positive economic impact on the lives of the local communities, especially the poor⁷. Apart from these, the Taj Trapezium Zone covers many such areas within the same region that flaunts its heritage sites and signifies to grow in the future based on the tourist economy. These heritage sites have been marked in the map below.

⁶ Institute of Social Sciences, India 2011

⁷ UP Tourism Pro-Poor Development Project Report, World Bank and Tourism Department, GoUP, July 2017



Map 3: Heritage and Tourist Sites in TTZ Region

Source: UNESCO Documents; ASI Documents; Bhuwan 2018; Primary Survey and Preliminary Analysis

As per the census 2011, the tourist inflow in this region has been increasing considerably in few cities like Agra, Mathura-Vrindavan followed by Bharatpur, Fatepur Sikri and Govardhan. There are various other locations like Gokul, Deeg, Nandgaon, Chhata, etc. that are unexplored and untouched. However, a projection of the current tourist inflow in few selected cities shows that in another three decades Agra, Vrindavan and Govardhan will see a considerable increase in the tourist influx over the years.

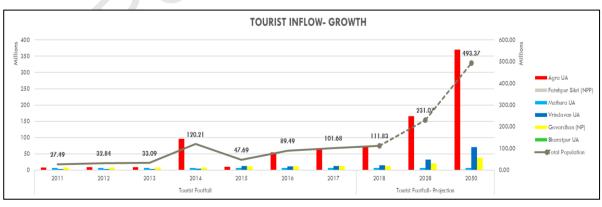


Figure 6: Tourist Inflow and Projections

Source: Uttar Pradesh Tourism, Department of Tourism Bharatpur and Preliminary Analysis

Settlement Pattern: Almost half of the population in most cities in the TTZ are estimated to be living in slums and low-income settlements, without access to adequate basic urban and social services or decent housing. Most of these slums/low income settlements are in the neighborhood of protected and unprotected monuments and heritage site. The presence of heritage assets in the neighbourhood applies strict regulations for development and does not

translate into any income gains or better infrastructure or services. Poor households therefore stay unconcerned about the heritage and do not contribute to their conservation⁸.

3.1.2 Development Strategies along Yamuna Expressway

Yamuna Expressway stretching 165 km connects international tourist destinations of Delhi and Agra. The Expressway is a 6-lane (extendable to 8 lane) access controlled superhighway and have 5 LFDs (Land of concessionaire) with facilities of 4 Toll Plazas, and 6 Interchanges along the entire length. Yamuna Expressway Industrial Development Authority (YEIDA) notified area covering approx. 2,689 sq. km falling in six districts to be developed in two phases⁹. The TTZ covers the southern part of the expressway.

Vamuna Expressway Profile

Yamuna Expressway Profile

Yamuna Expressway Profile

Yamuna Expressway Profile

S.no. YAMUNA EXPRESSWAY PROFILE

1 Veer of land acquisition
2005
2 Veer of start of construction 2009
3 Veer of operation 2012
4 Total project cost 13,300 Cr.
5 Length 165 km
6 Origin & Destination Ge. Notida & Agra
No. of lanes
9 Troffic expected in 2012 103/8 per day
10 Troffic expected in 2012 103/8 per day
11 No. of log plazar
12 No. of Infectionage
4 Keyn Total Plaza 13 km
12 No. of Infectionage
4 Keyn Total Plaza 15 km
12 No. of Infectionage
6 Total Plaza 15 km
13 No. of Infectionage
14 Km
15 No. of UPD S. Skm
15 No. of Infectionage
15 No. of UPD S. Skm
15 No. of Infectionage
16 No. of Infectionage
17 No. of Infectionage
18 No. of Infectionage
18 No. of Infectionage
19 No. of Infectionage
19 No. of Infectionage
10 No. of Infectionage
11 No. of Infectionage
12 No. of Infectionage
13 No. of UPDs
14 YEIDA notified Area
2689 km
15 No. of UPDs
16 YEIDA notified Area
2689 km
16 No. of UPDs
17 No. of UPDs
18 No. of UPDs
18 No. of UPDs
19 No. of UPDs
19 No. of UPDs
10 No. of UPDs
10 No. of UPDs
10 No. of UPDs
10 No. of UPDs
11 No. of UPDs
12 No. of UPDs
13 No. of UPDs
14 YEIDA notified Area
2689 km
16 No. of UPDs
17 No. of UPDs
18 No. of UPDs
18 No. of UPDs
19 No. of UPDs
19 No. of UPDs
10 No. of UPDs
11 No. of UPDs
12 No. of UPDs
12 No. of UPDs
13 No. of UPDs
14 YEIDA notified Area
2689 km
17 No. of UPDs
18 No. of UPDs
18 No. of UPDs
18 No. of UPDs
19 No. of UPDs
19 No. of UPDs
19 No. of UPDs
10
Map 4: Development along TTZ Region along the Yamuna Expressway

Source: Yamuna Expressway Industrial Development Authority

Table 1: YEIDA Notified Area

District	Area (sq. km.)					
G.B.Nagar and Bulandshahar	584	Phase I				
Aligar						
Mathura						
Mahamayanagar	2104	Phase II				
Agra						

Source: Yamuna Expressway Industrial Development Authority

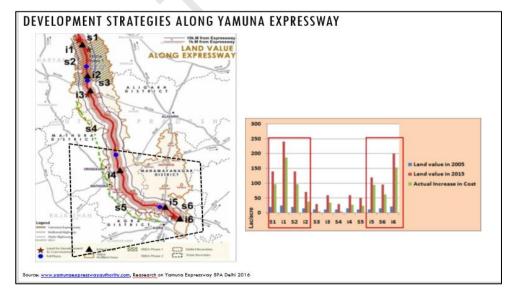
⁸ DPR Preparation and Safeguards Assessments of Proposed Y1 Subprojects Abbreviated Resettlement Action Plan (ARAP) Subproject1: Linkage of Kachhpura with Mehtab Bagh July 2016

⁹ Yamuna Expressway Industrial Development Authority Website [www. http://yamunaexpresswayauthority.com]

This proposed and on-going development along the Yamuna Expressway has given a rise in the land-value in the region. There is rapid spike in land value in all intersections along expressway specially during acquisition process. This has attracted big industrialists and bulk acquisition of land along the expressway¹⁰. The trend is growing with time.

The integrated Industrial Township Development Plans along the Yamuna Expressway proposes the development in two phases and in five zones. Zones 3 and Zone 4 that also falls in the TTZ Region shows proposed growth along the expressways near Mathura –Vrindavan i.e. Raya Urban Centre (Zone 3) and near Agra i.e. Zone 4. The land use plan of Raya Urban Centre illustrates that an extensive industrial hub is coming up across Mathura – Vrindavan. The detailed land use plan for Zone 4 was not available. However, the land-use plan along expressway near Agra as given in the Master Plan 2031 and the draft Master Plan for Outer Ring Road in Agra for 2031, proposes industrial growth along it¹¹. A proposed Leather Park has been planned to be developed in this region.

About 190 ha of area has developed in a haphazard way near expressway in recent five years and activities like food storage and transport carrier are major land uses that has come up along it. The Industries that has been relocated from the cities due to the impact of TTZ has found its way all along the expressways specially near Kosi Kalan, Chhata and Nandgaon



Map 5: Land Value Assessment along Yamuna Expressway

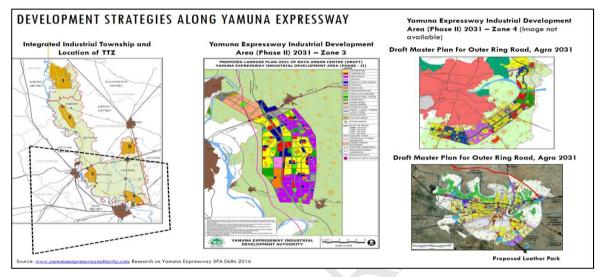
Source: Real Insights: Real Estate Overview Yamuna Expressway April-2015

¹⁰ Real Insights: Real Estate Overview Yamuna Expressway April-2015

¹¹ Yamuna Expressway Industrial Development Authority Website [www. http://yamunaexpresswayauthority.com]

areas. About 413 ha of large agricultural land converted to vacant land due to speculation and appreciation in land dealing¹².

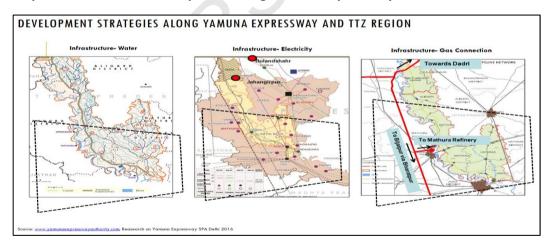
Map 6: Development Strategies along Yamuna Expressway and Land Use Plans of RAYA 2031 and Outer Ring Road Agra 2031



Source: Real Insights: Real Estate Overview Yamuna Expressway April-2015 and Yamuna Expressway Industrial Development Authority

However, the Infrastructure development plans all along Yamuna Expressways shows a lot of growth potentials in the years to come.

Map 7: Infrastructure Development Along Yamuna Expressway



Source: Real Insights: Real Estate Overview Yamuna Expressway April-2015 and Yamuna Expressway Industrial Development Authority

Real Insights: Real Estate Overview Yamuna Expressway April-2015 and Yamuna Expressway Industrial Development Authority; Primary and Secondary Surveys 2018

3.1.3 Selection of Cities

By the year 2025, around 75% of the world's population will be living in urban areas. The growth of the world population and the increase in the amount of floor space per inhabitant will accelerate land consumption. This continuous pressure on land and resulting urban sprawl will lead to deterioration of infrastructure and services, if appropriate planning and development goals are not set for the region. Out of 120 cities in the TTZ region, about six class I cities shows constant growth in the future and there are about two class II cities that shows a tendency to transformation into class I cities in the future. Apart from this there are two class III cities that has a very high tourist footfall and this increases with time. Therefore, based on the above conditions, the following cities has been selected for detailed planning intervention in the TTZ region. These cities are Agra, Mathura, Firozabad, Shikhohabad, Hathras, Bharatpur, Vrindavan, Tundla, Fatehpur Sikri and Govardhan. The details of all selected cities are given below in table No 2.

Table 2: Selected Cities in the TTZ Region

SN	STATE	DISTRICT	CLASS	Name of Town/City	TOTAL POPULAT ON		JLATION ECTION	AREA (SQ.KM.)	Density (PPH)	Tourist Footfal	Tourist Footfall- Projection
					2011	2018	2050	2011	2011	2017	2050
1	Uttar Pradesh	Agra	- 1	Agra UA	1760285	2060547	3433174	132.13	133	65929655	383467982
2	Uttar Pradesh	Mathura	I	Mathura UA	456706	550080	976931	38.91	117	6637867	6868764
3	Uttar Pradesh	Firozabad	I	Firozabad (NPP)	604214	724158	1272471	21.35	283		
4	Uttar Pradesh	Firozabad	I	Shikohabad (NPP)	107404	120874	182452	8.48	127		
5	Uttar Pradesh	Hathras	I	Hathras (NPP+OG)	143020	229282	623621	6.76	238		
6	Rajasthan	Bharatpur	I	Bharatpur (M Cl+OG)	252838	405813	1105125	57.77	44	432523	460927
7	Uttar Pradesh	Mathura	II	Vrindavan UA	71688	82185	130172	13.5	53	69278257	36034337
8	Uttar Pradesh	Firozabad	II	Tundla (NPP)	50423	81353	222748	8.25	61		
9	Uttar Pradesh	Agra	III	Fatehpur Sikri (NPP)	32905	35776	48899	8	41	747404	1195927
10	Uttar Pradesh	Mathura	III	Govardhan (NP)	22576	25433	38496	8	28	9607054	22576776

Source: Census 2011; U.P. Tourism Dept. 2017 and Projections

Mathura-Vrindavan

Mathura is located approximately 50 kilometers north of Agra, and 145 kilometers southeast of Delhi; about 11 kilometers from the town of Vrindavan, and 22 kilometers from Govardhan. Vrindavan is the twin city to Mathura. A long line of picturesque ghats with their steps leading to the water's edge, arched gateways and temple spires extending along the right bank of the River Yamuna, emphasize the sacred character of the town of Mathura. Mathura Vrindavan cover a geographic expanse of 3329.4 sq km. The population of Mathura is 456706 and the population of Vrindavan city is 71688. a decadal growth rate

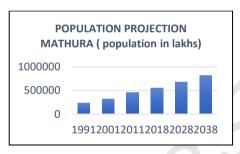
¹³ Brief Industrial Profile of District MATHURA 2016-17

of 22.53 per cent from 2001 census of India is noted. Males account for 54% and females for 46% of this population¹⁴.

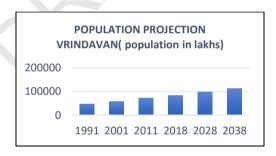
The total working population of Mathura is 139192 which is only 30.50% of total Population as per Census 2011, while the working population of Vrindavan is 21358 which is 29.80% of the total population. Main Workers are 24.61% and Marginal Workers are 5.85 % of Total Workers Population in Mathura, while the percentage of Main Workers and Marginal workers in Vrindavan are 24.38% and 5.40% respectively. Main workers include Cultivators, Agriculture Laborer, Household Industries and Other Workers. Remaining 70% of population is Non-Working Population. Mathura is divided into 45 wards in NPP and 7 wards in CB. Ward Number 2 and 30 are densely populated wards. Vrindavan is divided into 25 wards in UA and ward Number 24 is the most densely populated ward as per census 2011¹⁵.

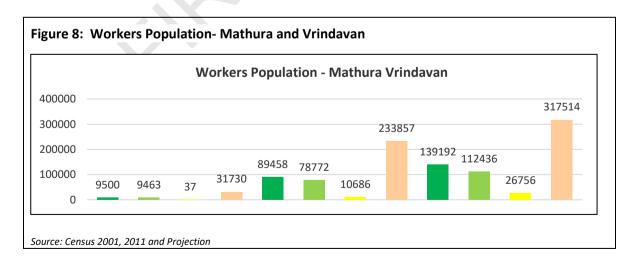
The normal day time floating population based on entries by UP Dept. of Tourism and local police was about 1.00 lakh per day in 2001. The floating population was 1.50 lakhs in 2011 and is projected to be 2.00 lakhs in 2021. On auspicious occasions, the floating population could exceed 5 lakhs and even 10 lakhs on certain days.

Figure 7: Population Projections of Mathura and Vrindavan, 2018



Source: Census 2001, 2011 and Projections



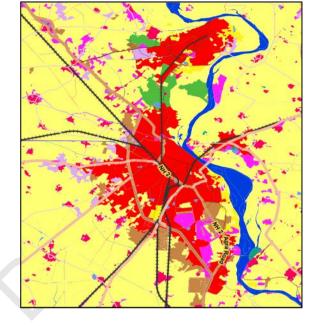


¹⁴ Census 2001 and 2011

¹⁵ Census 2001 and 2011; Indian Institute of Social Studies 2013

athura is centre for Heritage and Pilgrim in district, the tourism and small scale industrial activity support the economic growth of City. Small scale and house-hold industries include saree printing cottage industries, manufacturing of tape and cocks, petroleum products, packaging materials, garments etc.¹⁶





Source: Bhuvan Portal - Land cover of year 2005, 2011

The land-use and land cover changes over last few years shows that maximum development has taken place in and around both the cities. Vrindavan specially has converted into a metropolitan and with the expressway linking both the cities the development is seen specially in that direction.

Firozabad – Shikhohabad

Firozabad is an important Industrial and Commercial town in the western districts of the Indian state of Uttar Pradesh which has Firozabad Town as its headquarters. Firozabad City has become Nagar Nigam in 2014. City is famous for its Glass and Glassware items especially Bangle Industry. Total area of Firozabad City is 34.90 sq. km.17

The district is part of Agra division lies along the NH2 and having a population of 604214 persons.18 There are 99833 households in the city with an average household size of 6.05

¹⁶ RAY- slum free city plan of action – Mathura city 2014

¹⁷ Master Plan of Firozabad-Shikhohabad

¹⁸ Census 2001, 2011

pph and literacy rate of Firozabad is 66.32 % which is lower than that of Firozabad District which is 71.9. Overall gap in male-female Literacy rate is 13.2 %. The sex ratio of Firozabad (NPP) is 893 which is lower than state average of 912.

Total working population of Firozabad (NPP) is about 2,05,092 which is 33.94 % of the total population. Main Workers are 26.55 % and marginal workers are 7.4 %.

POPULATION

16849

13571

20183

20183

13571

40572

133863

NOITATION

NOITATION

A12866

A23866

A270534

A2

Figure 9: Population Projections - Firozabad-Shikhohabad

Source: Census 2001, 2011 and projections

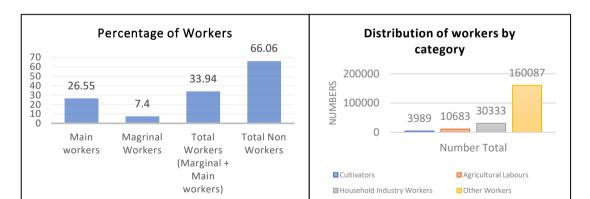


Figure 10: Percentage of Workers and Distribution of Workers by Categories, 2017

Source: Census 2001, 2011 and calculations

Total number of Marginal Workers comprises of cultivators (3989), agricultural labors (10683), household industry workers (30333) and other workers (160087). Remaining

percentage of 66.06% are non-working population¹⁹. The percentage share of other workers is high and that indicates the percentage share of workers who are engaged in the industries, trade and commerce.

r jouthed Private Name of the Control of the Contro

Map 9: Land Use and Land Cover Change 2005 and 2011

Source: Bhuvan Portal - Land cover of year 2005, 2011

The growth direction states that it is growing along the expressway and is spreading in all directions except the south western part where the river acts like an obstacle in its growth. In another fifty years there are high chances of merging of both the cities of Firozabad and Shikhohabad.20

Hathras

Hathras is an ancient city and a municipal board in the newly named Mahamayanagar (previously Hathras district), in the Indian state of Uttar Pradesh. It is the headquarters of the district that was created in 1997, by incorporating parts of: Aligarh, Mathura, Agra Districts, and Khair Tehsil. It forms a part of Aligarh Division21. Hathras lies within the Braj region in Central or Middle Doab and is associated with the epic Mahabharata and Hindu theology. Hathras is located at 27.6°N 78.05°E. It has an average elevation of 178 meters (584 feet). It is situated on Agra, Aligarh and Mathura, and Bareilly Highways crossing. Variations in temperature are extreme. As of 2011 census, Hathras urban agglomeration had a population

¹⁹ Census 2001 and 2011

²⁰ Primary and Secondary Surveys 2018; Master Plan of Firozabad 2023

²¹ District Census Handbook, Mahamayanagar, 2011

of 161,289 lakhs; in which 86,028 lakhs are males and 75,261 lakhs are females. The literacy rate is 78.05 percent22.

The total worker's population of Hathras is 47502 which accounts to 29.52% of total Population. The percentage of non-working population is 70.48%. The category of workers identified in Census are as follow: Cultivators, Agricultural labourers, household Industry labourers and others.

Population Projections

200000
150000
50000
1981
1991
2001
2011
2018
2028
2038
2048
2050

Figure 11: Population Projections

Source: Census 2001, 2011 and projections

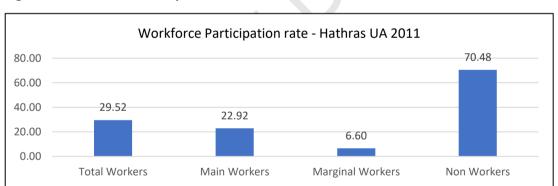


Figure 12: Workforce Participation Rate

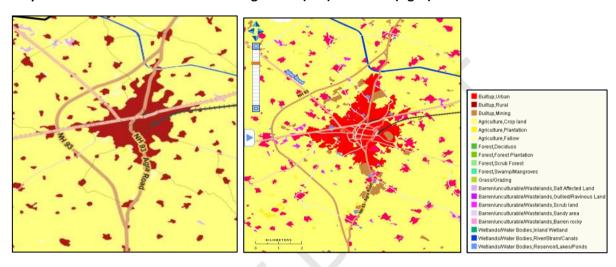
Source: Census 2001, 2011 and Calculations

Hathras was an industrial hub during the British Raj. Cotton milling, knives, the spice asafetida or "Hing", and Desi Ghee products were the main industries. The last two continue to thrive. Hathras is now notable for: Holi Colour and Gulal skin powders, the manufacture of readymade garments, chemicals, carpet manufacturing, artificial Moonga-Moti pearls, brass, artware and hardware, edible oil, metal handicrafts and beverages23.

²² District Census Handbook, Mahamayanagar, 2011

²³ Brief Industrial Profile of District Hathras 2011

The 'Baghichis' or the gardens of the city are still a popular rendezvous for evening sittings. A typical feature of almost every bagichi is the akhara or the wrestling ring where juveniles and adults practice various forms of wrestling. The city, owing to its historical cultural background, has numerous temples. Besides them a temple-cum-research complex Mangalaytan has been developed on the Aligarh-Agra Highway. The Mangalaytan complex is one of the largest Jain religious centres of its kind in the country and also houses the Mangalayatan University



Map 10: Land Use and Land Cover Change 2005 (left) and 2011 (right)

Source: Bhuvan Portal - Land cover of year 2005, 2011

Bharatpur

Bharatpur is a city and a municipal corporation in the Indian state of Rajasthan. Bharatpur Municipal Corporation is divided into 50 wards. Located in the Braj region, Bharatpur was once considered to be impregnable and unbeatable. The city is situated 58 km west of Agra of Uttar Pradesh and 38 km from Mathura of Uttar Pradesh. It is also the administrative headquarters of Bharatpur District and the headquarters of Bharatpur Division of Rajasthan State. The city has an average elevation of 183 meters (600 ft) and is also known as "Lohagarh" and the "Eastern Gateway to Rajasthan" Lis famous for the Keoladeo National Park (A UNESCO's World Heritage Site). Bharatpur lies on the Golden Tourism Triangle of Delhi–Jaipur–Agra and hence a large number of national and international tourists visit Bharatpur every year.

As of 2011 Indian census, Bharatpur district had a population of 2,548,462 of which males are 1,355,726 and females are 1,192,736. Bharatpur has an average literacy rate of 82.13%,

²⁴ Lohagarh Fort, 2017

higher than the national average of 74.04%; with male literacy of 90.41% and female literacy of 72.80%. ²⁵

POPULATION PROJECTIONS

5,00,000
4,00,000
3,00,000
1,00,000
0
1981 1991 2001 2011 2018 2028 2038 2048 2050

Figure 13: Population Projections

Source: Census 2001, 2011 and Projections

The total worker's population is only 28.66% of total population, out of which 25.17% are main workers and 3.49% are marginal workers. About 71.34% are non-working population.

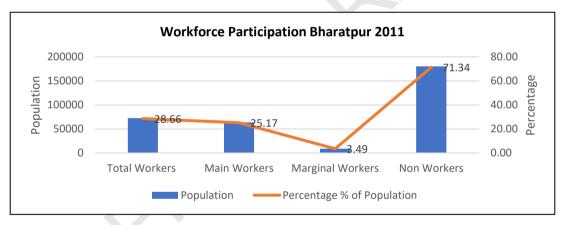


Figure 14: Workforce Participation in Bharatpur

Source: Census of India 2011

Being an agriculture preferred area and touched from Haryana, Uttar-Pradesh, the economy of Bharatpur district is dependent to a large extent on agriculture and its products. The main crops grown are wheat, mustard, millet and potatoes. There are many OIL mills in Bharatpur due to mustard grown in large quantity in Bharatpur and in the surrounding areas. Bharatpur is famous for its Sweets and Milk Production. In some areas of Bharatpur District like-Hindaun & Karauli etc. stone quarrying is also practised. Many of nearby State's Forts like The Red Fort of Delhi, Agra Fort, and Fatehpur Sikari were built using local stone.

²⁵ Census 2001, 2011

Bharatpur also gets an amount of its Economy from Tourism due to Keoladeo National Park & many Hindu Temples also due to better connectivity to Uttar Pradesh, Jaipur, Sawai-Madhopur by Road & Railways transportation facilities.²⁶

The economy of Bharatpur district is dependent to a large extent on agriculture and its products. The main crops grown are wheat, mustard, cotton, red-chilies and potatoes. There are more than 100 oil mills in Bharatpur due to mustard grown in large quantity in the surrounding areas. Bharatpur is famous for its sweets and has a large number of shops also²⁷.

The above maps indicate that the city is experiencing growth in all directions, majorly in southwest, south and north direction, that is, along the Bikaner- Agra road and Fatehpur Sikri Road.

Map 11: Land Use and Land Cover Change 2005 (left) and 2011 (right)

Source: Bhuvan Portal - Land cover of year 2005, 2011

As per Master Plan 2023, the city should experience growth in all directions except the Southern direction due to the presence of Keoladeo National Park. Brij Industrial Estate is situated in the north and majorly constitutes of Oil mills and refineries²⁸.

Tundla

Tundla is a town and a municipal board in Firozabad district in the Indian state of Uttar Pradesh. It is located 24 km away from Agra city. A major railway junction in the eastern railways system in India, it is an old city that is growing because of its locational value. It links Firozabad on its east (17 kms) and Agra on its west. Tundla has a rich heritage of British rule. High walled British constructions, huge barracks, a Catholic church built in 1887, an old Jain temple, Kothis (Bungalows) of officers surrounded by sprawling lawns adorn Tundla as the

²⁶ Web portal of Bharatpur, www.bharatpur.rajasthan.gov.in

²⁷ District Census Handbook, Bharatpur, 2011

²⁸ Master Plan of Bharatpur 2023

main center of British administration. These old and beautiful British buildings have now been converted into railway quarters currently²⁹.

Tundla is a Nagar Palika Parishad (NPP) in District Firozabad with total population of 50423 as per Census 2011. The total population of Tundla Urban Agglomeration is 64906 as per Census 2011 which includes Tundla Nagar Palika Parishad, Tundla Railway Colony and Tundla Kham area with population 50423, 7404 and 7079 respectively. The literacy rate of Tundla is 86.4%, as per the Census 2011 which is higher compared to 71.9% of Firozabad district literacy rate³⁰.

The total working population of Tundla NPP is 13719 which is only 27.21% of total Population as per Census 2011. Main Workers are 20.58% and Marginal Workers are 6.63 % of Total Workers Population. Main workers include Cultivators, Agriculture Laborer, Household Industries and Other Workers. Remaining 72.79% of population is Non-Working Population³¹.

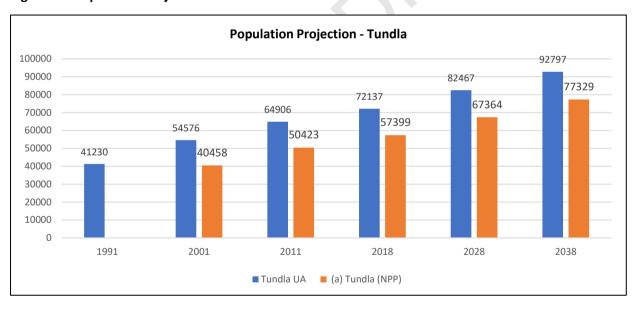


Figure 15: Population Projections

²⁹ Tundla Nagar Parishad 2018

³⁰ Census 2001, 2011

³¹ Census 2001 and 2011

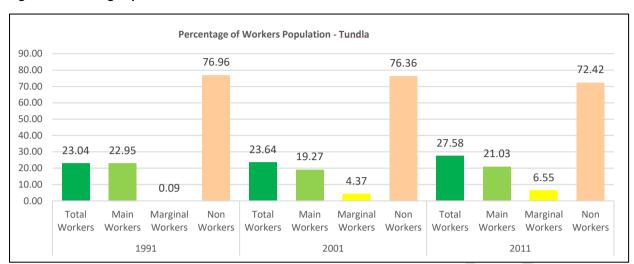


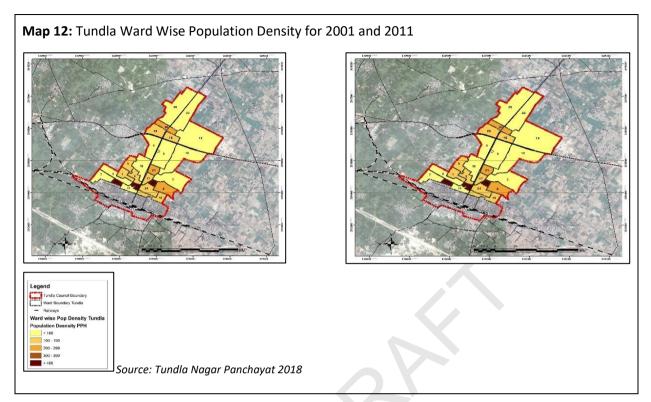
Figure 16: Working Population in Tundla

Source Fig 15 and Fig 16: Census 2001, 2011 and Population Projections

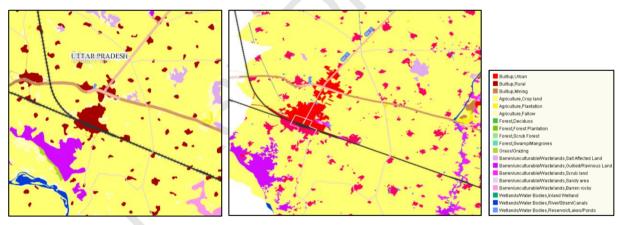
Tundla is divided into 25 wards excluding Tundla Railway Colony (CT) and Tundla Kham (CT). Ward Number 10, 14 & 15 are densely populated wards with Population density > 400 pph along Railway Station Road.

Total 27.58 % of total population are working population, out of which 21.03 % are main workers and 6.55% are marginal workers. Remaining 72.42 % of total population are non-working population. Tundla is situated on Agra-Firozabad Highway which has potential for commercial activities like hotels and restaurants along highways. Tundla has only three heritage places which does not generate tourist economy. ³²

³² Primary Survey analysis.



Map 13: Land Use and Land Cover Change 2005 (left) and 2011 (right)



Source: Bhuvan Portal - Land cover of year 2005, 2011

The above maps indicate that the city is experiencing growth in all directions, except the southern part of the city along the Railway line and the junction. In five years' period between 2005 and 2011, when it became a Nagar Panchayat, the city has seen tremendous growth because of a Mandi that came up within the city and the expressway which made the connectivity very strong. Currently, the growth directions are mainly along the expressway that is crossing the city33.

³³ Tundla Nagar Panchayat and Primary Surveys 2018

Fatehpur Sikri

The medieval city of Fatehpur Sikri is a world heritage monument in India, visited by many domestic as well as international tourists. Located about 120 miles south of New Delhi, the capital of India, Fatehpur Sikri is a city frozen in time: a place where Mughal architecture, urban planning, and urban design principles can be seen, intact, as they were in the sixteenth century. The city's imperial complex serves as its focal point. Urban tourism is important to Fathepur Sikri; the city attracts many tourists, both domestic and international. Tourism is a significant activity in the city, and its importance is likely to increase in the future34. But the city surrounding the monument today, is in a miserable condition with lack of infrastructural provisions, greenery, recreational areas and shabby household industries within residential areas.

Fatehpur Sikri is a Nagar Palika Parishad (NPP) in District Agra with total population of 32905 as per Census 2011. It is the Fortified ancient walled city situated 40km west from Agra. Fatehpur Sikri was founded by the Great Emperor Akbar in 1571 as Capital of Mughal Empire. There are around 57 heritage sites which includes Monuments, Gateways, Pilgrims, Gardens, and Markets etc. Fatehpur Sikri has huge potential to be developed as Heritage City. The projected population for 2018 is 35776 lakhs. The literacy rate of Fatehpur Sikri is 62.1%, as per the Census 2011 which is lower compared to 71.6% of Agra literacy rate. The sex ratio of Fatehpur Sikri is 892 as per Census 2011 which is lower than national average sex ratio35.

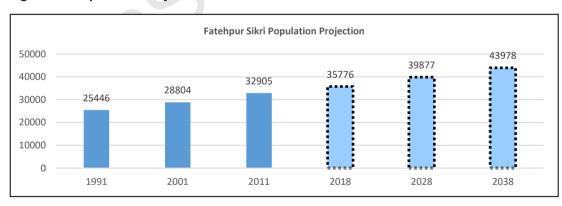


Figure 17: Population Projections

Source: Census 2001, 2011 and Population Projections

³⁴ Fatehpur Sikri: A Utopian Approach to Urban Planning and Design, Rajinder S. Jutla, Southwest Missouri State University, USA

³⁵ Census 2001 and 2011

The total working population of Fatehpur Sikri is 13719 which is only 30.64 % of total Population as per Census 2011. Main Workers are 22.15 % and Marginal Workers are 8.49 % of Total Workers Population. Main workers include Cultivators, Agriculture Laborer, Household Industries and Other Workers. Remaining 69.36 % of population is Non-Working Population.

Workforce Participation Rate 2011

22.15

Main Workers

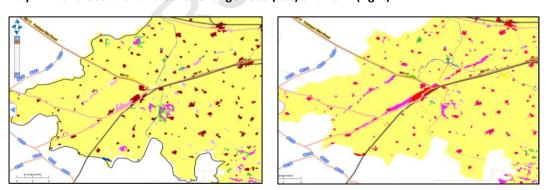
Marginal Workers

Non Working

Figure 18: Workforce Participation Rate

Source: Census 2011 and Calculations

Fatehpur Sikri is divided into 25 wards. Ward number 1, 3, 8, 16, 18 have high population concentration as per Census 2011. Fatehpur Sikri is an example of walled city build in Mughal era. This city has potential for generating tremendous economy through tourism related activity. 30.64 % of total population are engaged in cultivation, agricultural laborers, household industries like carpet making and weaving and others. ³⁶



Map 14: Land Use and Land Cover Change 2005 (left) and 2011 (right)

Source: Bhuvan Portal - Land cover of year 2005, 2011

The above maps indicate that the city is experiencing growth in mainly in the south western part of the city along the main entrance to the city that connects it with the expressway. In

³⁶ Census of India 2011.

five years' period between 2005 and 2011, it has gained an urban center status and is growing currently.

Govardhan

Govardhan and Radhakund towns has rich cultural and religious importance in India. Both cities are Nagar Panchayats falling in Mathura District under the Mathura Vrindavan Part G zone. It is the key pilgrimage center situated 23 Km west from Mathura and 20KM west from Vrindavan. The focal point of Govardhan city is Govardhan Hill of around 8 Km long distance.

The current population of both cities together is around 30087 lakhs as per Census 2011. The projected population for 2018, 2028 and 2038 are 25433, 29515 and 33597 respectively. The literacy rate of Govardhan is 75.2%, which is higher compared to 70.4% of Mathura literacy rate. The sex ratio of Govardhan is 864 as per Census 2011.

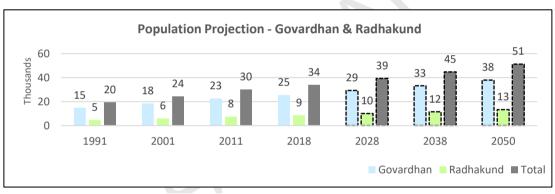
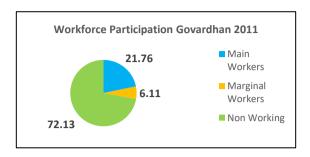


Figure 19: Population Projections

Source: Census of India 1991, 2001 & 2011, Preliminary analysis and projection

The total working population of Govardhan is 6219 which is only 27.87 % of total Population as per Census 2011. Main Workers are 21.76 % and Marginal Workers are 6.11 % of Total Workers Population.

Figure 20: Workforce Participation, Govardhan 2011



Source: Census of India 1991, 2001 & 2011, Preliminary analysis and projection

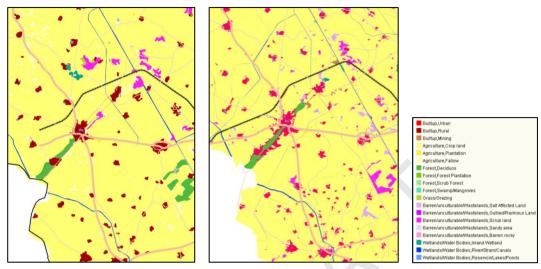
Main workers include Cultivators, Agriculture Labourer, Household Industries and Other Workers. Remaining 72.13 % of population is Non-Working Population. Govardhan was divided into 13 wards in 2001 and one additional ward was added in 2011. Ward number 2, 3, 4, 6 and 7 have high population concentration as per Census 2011.

Increasing number of pilgrims (five to seven million annually by some accounts) has stressed the carrying capacity of the landscape. The existing infrastructure to support the movement and needs of such large numbers is inadequate³⁷.

Govardhan is a sacred city with Govardhan Hill and ancient temples. The main economic source of local population is generated from farming, herd livestock and benefit from pilgrimage to local economy. Temples drive local economy with self-generated demand for small shops whih supply sacred objects necessary for temple worship rituals.³⁸

³⁷ Sacred Landscapes of Govardhan in Braj Imagined, enacted and reclaimed, AMITA SINHA, Context VIII, 2011

³⁸ Govardhan Hill in Braj, India. Report by Unversity of Illinois at Urbana-Champaign, USA and Braj Foundation, Vrindavan, India. 2014



Map 15: Land Use and Land Cover Change 2005 (left) and 2011 (right)

Source: Bhuvan Portal - Land cover of year 2005, 2011

The above maps indicate that the city is experiencing growth mainly in the north eastern part of the city near the village area. In five years' period between 2005 and 2011, it has gained an urban center status and is growing currently. There is a percentage loss in the green cover around the city showing the impact of the growth all around it.

3.1.4 The City: Agra

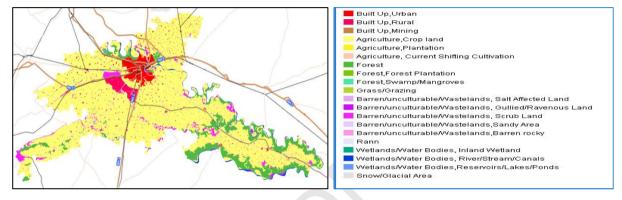
The City of Agra is synonymous with river Yamuna and The Taj Mahal on its banks. Though, Agra got its global identity because of this iconic mausoleum in marble and came into prominence after its conquest by the Mughals, it's actual history dates back to as far as 3100 BC, to the times of the epic, Mahabharata, where it finds it's mention as Agrevana or the edge of the forest. It is ironical today that the forests that gave the name of the city have fast disappeared and the white marble tomb that became its legacy, is falling prey to the environmental effects of fast paced development. The vision of this document is to revive the dying river Yamuna, conserve Agra's rich heritage and protect Taj Mahal's outstanding universal value.

Agra tehsil which comes under Agra district having a total area of 528.64 km. It has semi-arid climate continental type of climate with low monsoonal rains. It has a population of around 33,99,042 with literacy rate of around 70%. The area falls in the doab of Yamuna and Utangan rivers. Ravine land along the Yamuna & Utangan river is a common feature making the land unsuitable for agriculture.

Map 16: Land use Map Agra District and Tehsil LU/LC - 2002 - 2015

Table 1: AGRA TEHSIL - LU / LC IN 2002 AND 2015

Sr. No.	Land Use / Land Cover Classes	Area in Km ² (2002)	Area in % (2002)	Area in Km ² (2015)	Area in % (2015)	Variation from 2002 to 2015 (Km²)
1	Moderate Forest	8.28	1.56	4.35	0.82	3.93 ▼
2	Open Forest	8.71	1.64	2.24	0.42	6.47 ▼
3	Open scrub	105.4	19.93	8.95	1.69	96.45
4	Built-up Land	230.69	43.69	305.44	57.80	- 74.75
5	Agricultural Land	126.26	23.88	104.91	19.84	21.35
6	Water body	15.23	2.88	12.06	2.28	3.17 ▼
7	Barren Land	34.07	6.44	90.69	17.15	-56.62
	TOTAL	528.64	100	528.64	100	-



Source: Bhuvan Website and Land use land cover of Agra tehsil: A comparative study from 2002 to 2015; Bob Stanley Gardner*, Brototi Biswas, Praveen Andrew Majeed Department of Geography, St Johns College, Agra, India

Agra is a city found in Uttar Pradesh, India. It is located 27.18 latitude and 78.02 longitude and it is situated at elevation 166 meters above sea level. Agra, the city of Taj Mahal is the 3rd most populous city in Uttar Pradesh and is administrative headquarters of the Agra district. The city of Agra is situated on the Western Bank of river Yamuna on National Highway (N.H2) at about 200 Kms from Delhi in the state of Utt ar Pradesh. It has an extremely strategic location on the confluence of three distinct geo-physical regions namely the plain of Uttar Pradesh, the plateau of Madhya Pradesh and the desert of Rajasthan. The city also falls in the center of the four-culture areas- Braj, Bundelkhand, Rajputana and western U.P.

Agra is ranked amongst the most outstanding historic cities in the world and certainly best known tourist destinations in India. The city boasts three World Heritage Sites namely – the Taj Mahal, Fatehpur Sikri & Agra Fort and innumerable other monuments of national and indeed international importance. The river Yamuna enters the city from the north-east corner, flows towards south for some distance and then turns towards east. The general slope is from west to east in CIS-Yamuna area on the right bank of the river Yamuna. The climate of Agra city is extreme and tropical. During summer season the maximum temperature of the city rises to 470 degrees Celsius and drops down to minimum of 3 degrees Celsius during winter season. The city receives moderate to high rainfall with an average yearly rainfall of about 686mm. The ground levels at Agra vary from RL 150 m to 170m. The

strata consist of mainly sandy soil. The sub-soil water level is generally 6 to 8m below ground level. The HFL of Agra City is 154.76m at Jawahar Bridge. The city stretches for about 9.0 kms along the Yamuna river. The major part of the city is on the Western side of Yamuna and has grown beyond the river on the eastern side and is called the Trans Yamuna area while the original part is called as CIS Yamuna.

The population of the city as per Census 2011 is 15,85,704 inhabiting an area of 141.0 sq km. The city is divided into 90 wards. For a city with million plus population that has grown at more than 25% in last thirty years, the infrastructure development has failed to keep pace with population growth.39. The projected population for 2038 is 2424243 which is approximately 34% rise. The projected population for 2050 is 2796927.

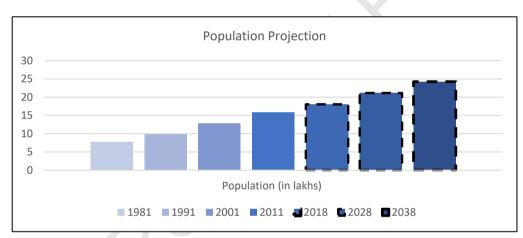


Figure 21: Population Projection of Agra

Source: Census 2001, 2011, and Calculations

Growth in Agra has followed the central core to periphery pattern as can be observed from the populations maps from Bhuvan, ISRO (1991 - 2014). Agra's decadal growth rate has an average of 28%. Most of which is concentrated in the core. Approximately 20% of the Municipal area of Agra grew from 68 sq km to 141 sq km between 1981 to 1991⁴⁰. Today, the municipal area stands at 1368 sq km41.

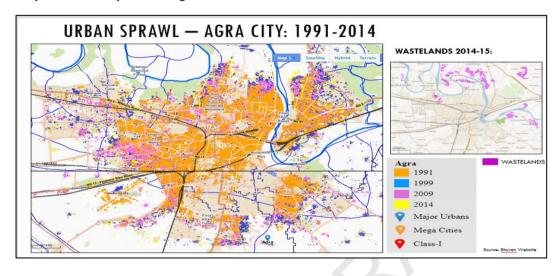
³⁹ Census 2011

⁴⁰ RAY Slum free City Agra Study

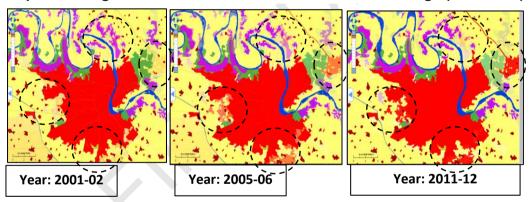
⁴¹ Existing landuse data and Municpal boundary coverage

The land use / land cover change shows that maximum change of land has happened from agricultural and open scrub lands to Built-up and barren land. Even water bodies are getting converted to barren land which is an area of concern.

Map 17: Urban Sprawl of Agra 1991 - 2014



Map 18: Change in Land Cover 2001 - 2012 and LU/LC Change (2002-2015)



Source: Bhuwan Website

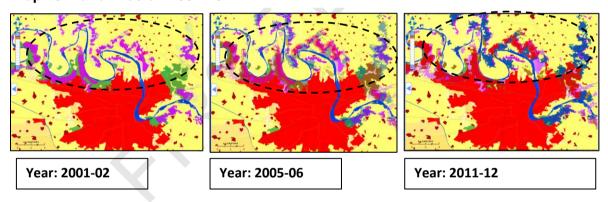
Table 3: Class Wise LU/LC Change (2002 -2015)

SI No.	Change to	Built up	Barren	Moderate Forest	Open Forest	Water Body	Open Scrub	Agriculture	TOTAL (2002)
	Change from	Area	Area	Area	Area	Area	Area	Area	
1	Built up	205.83	4.55			-	0.28	20.03	230.69
2	Barren Land	27.21	4.44			-	1.29	1.13	34.07
3	Moderate Forest	0.54	0.03	4.23	0.4	-	1.83	1.25	8.28
4	Open Forest	1.09	1.57	0.12	0.9	0.17	2.1	2.76	8.7
5	Water body	0.35	2.79			11.89		0.2	15.23
6	Open scrub	35.17	33.14	0	0.8	0	2.35	33.94	105.4
7_	_Agriculture_	35.25	44.17	_0	0.14	0	1,1	45.6	1 <u>26.2</u> 6 #
	TOAL (2015)	305.44	90.69	4.35	2.24	12.06	8.95	104.91	

Source: Bhuvan Website and Land use land cover of Agra tehsil: A comparative study from 2002 to 2015; Bob Stanley Gardner*, Brototi Biswas, Praveen Andrew Majeed Department of Geography, St Johns College, Agra, India

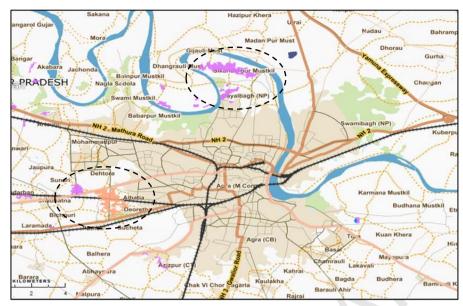
The decadal study shows that the rate of erosion taking place in and around the River Yamuna in the northern part of the city is extremely fast. The erosion rate is fast and is eating up areas around the industries and also the settlements residing along the river. The rate of erosion is also very high around the world heritage site of Taj Mahal which is the biggest concern. There is an urgent need to restore and redevelop the region along the river Yamuna around the city.

Map 19: Land Erosion 2001-2012



Source: Bhuvan Website

The river has extremes of dry as well as flood conditions during a year. Due to high population density of the catchment, the river remains almost in dry state during January to June in many parts of its stretch and under flooded conditions during July-September. The Yamuna is now the source of irrigation for Uttar Pradesh and Punjab states. The East Yamuna, West Yamuna, and Agra are the major canals on the river. The drainage system of the area is controlled by the river Yamuna and it's tributaries. All the rivers are mainly flowing in accordance with the general slope of the land surface viz. northwest to southeast. Because of flooding and erosion in the meandering course of the river near the city there are areas where there is waterlogged during the seasons.



Map 20: Water logged areas of Agra

Source: Bhuvan Website and Ecological Characterization of the River Yamuna in Tajewala to Wazirabad stretch; a research study; 2006;

http://shodhganga.inflibnet.ac.in/bitstream/10603/147811/10/10_chapter_03.pdf

The work force participation rate (WFPR) of the city is 25.5 per cent. The occupational structure of the city shows that the majority of the population is engaged in tertiary sector (88.68 per cent) and minimum in primary sector 3.50 per cent. The percentage share of Nonworkers is also very high.

Table 4: Working Population Agra Urban Agglomeration

Table 5: Population
Agra Municipal Corporation

	2001	2011		2001	2011
TOTAL WORKERS	341597	573297	TOTAL WORKERS	325193	516859
MAIN WORKER	299446	444660	MAIN WORKER	284650	400613
MARGINAL WORKER	42151	128637	MARGINAL WORKER	40543	116246
NON-WORKER	989742	1186988	NON-WORKER	949941	1068845
NON-WORKER MALE	414343	4801 <i>57</i>	NON-WORKER MALE	398717	433299
NON-WORKER FEMALE	575399	706831	NON-WORKER FEMALE	551224	635546

Table 6: Occupational Structure

Occupational	2011		20	01	1971	
Structure	Numbers	Percentage	Numbers	Percentage	Numbers	Percentage
Primary	15567	3.07	11961	3.78	4410	2.87
Secondary	79453	15.66	52252	16.50	13325	8.69
Tertiary	412345	81.27	252437	79.72	135660	88.44
Total	507365	100	316650	100	153395	100

Source: Census of India, 2001 and 2011; Agra Master Plan 1971 and 2021

The major part of Agra's industrial activity is in the form of small-scale and house-hold industries located in the old Mughal city particularly Lohamandi, Rakabganj, Kotwali, Tajganj areas. The important industries are textile, leather, foundries, electrical goods, fans, pipes, casting, leather goods including shoes, etc. Agra has been a center of traditional handicraft industries from the Mughal times. The major handicrafts are marble, leather, carpet, brassware, artistic carpets and jewelry crafts.

There are more than 50000 shops & commercial establishments registered at Nagar Nigam. The average growth rates of commercial establishments are high compared to hotels & restaurants. There are more than 50000 shops & commercial establishments registered at Nagar Nigam. The average growth rates of commercial establishments are high compared to hotels & restaurants.

Agra has a booming tourism industry as well as royal crafts like Pietra Dura, marble inlay and carpets. Agra city has its leather goods, the oldest and famous leather firm Taj Leather World is in Sadar bazar. The carpets, handicrafts, zari and zardozi (embroidery work), marble and stone carving and inlay work. Agra is known for its sweets (Petha and Gajak) and snacks (Dalmoth), garment manufacturers and exporters and an automobile industry. Carpet making was introduced to the city by Moghul Emperor Babur and since then this art has flourished. The city centre place at Agra has jewellery and garments shops. The silver and gold jewellery hub is at Choube Ji Ka Fatak. The Shah Market area is an electronics market while Sanjay Place is the trade centre of Agra.

The Master Plan 2021 envisages about 450,000 number of households in the city with family size of 5. The city has 199,497 residential units on which the deficit is about 16585 units. The Master Plan has also envisaged that the city will require 256,488 units by the year 2021. The new residential colonies are being developed by ADA and Avas Vikas Parishad⁴².

⁴² Census of India, 2001 and 2011; Agra Master Plan 1971 and 2021

Agra is ranked amongst the most outstanding historic cities in the world and certainly one of the best known tourist destinations in India. The city boasts three World Heritage Sites namely – the Taj Mahal, Fatehpur Sikri & Agra Fort and innumerable other monuments of national and international significance. The city forms one of the three major cities of the prime tourist circuit in India, The Golden Triangle, the other two being Delhi and Jaipur.

Statistics based on data from UP Tourism have shown Taj Mahal as the obvious main attraction in the city and has an average of 62,28,721 visitors per year (2013-2017). A per day footfall at Taj Mahal peaks to 60,000 to 70,000 visitors in peak season. The other attractions being Agra fort, Itmad-ud-Daulah, Mahtab Bagh, Sikandram Mariam's Tomb and Ram Bagh. Fatehpur Sikri, though not in Agra, is a popular destination most visitors club with Agra.

As per the Tourism Policy seven new circuits are being introduced. One being - Heritage Arc (Agra-Lucknow-Varanasi) region. Significant infrastructure development projects/schemes such as Lucknow Agra Expressway, Yamuna Expressway, HRIDAY, AMRUT, Smart Cities, etc are ongoing or proposed.

Tourist Footfall At Major Tourist Destinations in Agra - Foreign Nationals 1000000 800000 600000 400000 200000 Taj Mahal Agra Fort Mahtab Mariam's Ram Bagh Sikandra Itmatud Fatehpur daulah Bagh Tomb Sikri **■** 2013 **■** 2014 **■** 2015 **■** 2016 **■** 2017

Figure 22: Tourist Footfall at Major Tourist Destinations in Agra - Foreign Nationals

Source: UP Tourism, and calculations

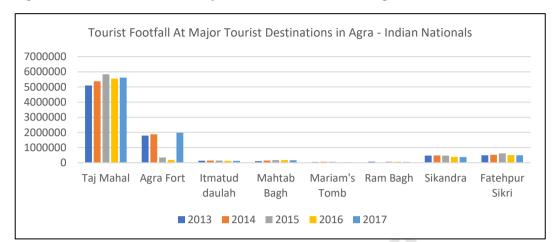


Figure 23: Tourist Footfall At Major Tourist Destinations in Agra - Indian Nationals

Source: UP Tourism, and calculations

Table 7: Locations for niche tourism products

S. No.	Tourism Segment	Potential Locations
1	Ecotourism and Wildlife	Dudhwa, Katerniaghat, Pilibhit Tiger Reserve, Chambal WLS and other bird sanctuaries etc.
2	Adventure Tourism / Aero Sports / Water Sports	Aero Sports- Devangana Valley (Chitrakoot), Kalinjar (Banda) Water Sports - Urmil Sagar (Mahoba), Charkhari (Mahoba), Gadhmau, Pahuj Dam, Baruasagar — Jhansi; Talbehat , Govindsagar, Jakhlaun, Sumera Talab — Lalitpur, Adventure/Camping — Deogarh
3	Sports Tourism	F1Track Greater Noida, Golf course in Noida and Lucknow, Badminton Academy in Lucknow, International Cricket Stadium in Kanpur
4	Cultural Tourism	Lucknow , Varanasi , Mathura etc.
5	Crafts/Handloom and Textiles	Lucknow, Badhoi, Varanasi, Allahabad, Azamgarh, Kanpur, Agra, Bareilly, Moradabad, Saharanpur, Khurja, Pilkhua
6	Rural Tourism -	Agra, Lucknow, Varanasi, Azamgarh
7	MICE Tourism	Noida, Lucknow, Varanasi, Agra
8	Medical Tourism	Noida, Lucknow
9	Wellness Tourism	Varanasi, Agra,
10	Film Tourism	Agra, Lucknow, Varanasi, Kanpur, Noida, Jhansi, Mathura, Vrindavan

Source: UP Tourism Plan

3.5 The Precinct: Taj Mahal and Surrounding

'The Precinct' is one of the three delineated study areas for developing the TTZ Vision document. As the word 'precinct' summarizes, the precinct zone comprises of the immediate regulated zone around the prominent heritage sites of Agra, The river Yamuna, The Taj Mahal, The Agra Fort, The Mehtab Bagh, Itmad-ud-daulah and Ram Bagh. 'Regulated area' means "an area near or adjoining a protected monument which the central Government has, by notification in the official gazette, declared to be a regulated area, for purposed of mining operation or construction of both."43

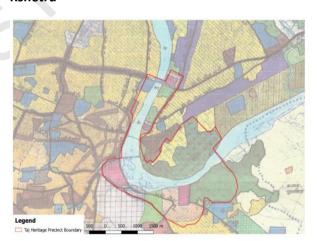
The Central Government has declared upto 100 meters from the protected limits to be prohibited area and further beyond it up to 200 meters to be regulated area for purposes of both mining operation and construction around heritage sites of significance.

The 'heritage precinct' as defined by CPWD, "means and includes any space that requires conservation and/or preservation for historical and/or architectural and/or aesthetic and/or cultural and/or environmental and/ or ecological purpose. Walls or other boundaries of a particular area or place or building or may enclose such space by an imaginary line drawn around it."44

Map 21: Vision Plan Boundaries



Map 22: Agra Master Plan 2021 "Dharohar Kshetra"



The Agra Precinct, constitutes of three layers. Layer 1, the Core Precinct, encompasses, the 'Taj Dharohar Kshetra' or the Heritage zone delineated in the Agra 2021 Master Plan as a

⁴³ Source: Archaeological Survey of India

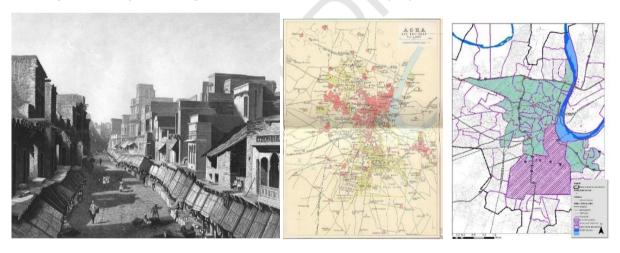
⁴⁴ Source: Conservation of Heritage Buildings - CPWD

strategy to protect the heritage sites of global and national importance. The precinct boundary has been defined by the ward boundaries that include, whole or part of the Dharohar Kshetra, from planning perspectives.

The Old City of Agra forms the extended layer of the precinct because of its heritage value and historic character. A greater part of the old city, was an extended part of the Agra fort and many of the internal lanes still echo a Mughal past, though dilapidated from aging and use beyond capacity.

Dense slum developments have buried much of the historic architectural remnants but the residents still carry the traditional handy craft skills passed on from generations, which has now become a cultural heritage. The cantonment area reminiscent of the colonial period is the second extended layer of the precinct. Unlike the old city, this part has been well preserved and conserved. Most of the heritage buildings from the colonial period are used as administrative offices.

Figure 24: Photo of an Agra Bazar in the 1858. Map 23: The map of Agra from 1893. Map 24: Map showing the old city wards in green and cantonement area in purple.



Source Fig 24: https://www.reckontalk.com/15-rare-old-photos-of-the-city-of-taj-mahal-agra/

The heritage sites of global significance including, the Taj in the precinct area are uniquely located between a layer of green belt and river on one side and dense urban settlement on the other which poses the challenge of sustainable development and integrating conservation with urban growth.

Figure 25: Taj Mahal Precinct Location Profile



Source of Photos: Google Earth, online images

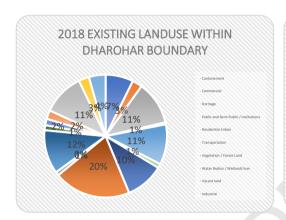
About 20% of the Land within the 'dharohar kshetra' boundary is water body, wetland and river. Agriculture, forest cover and reserve forest comprise about 32% of the landuse. Heritage sites constitute of about 11% while residential covers around 13% landuse of which 21% of the residential use also generates income through home-based cottage industry.

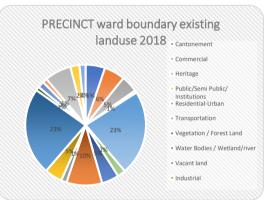
Table 8: 2018 Existing anduse within precinct ward boundary					
LANDUSE	AREA IN HECTARE				
Cantonment	124.59				
Commercial	133.25				
Heritage	107.81				
Public/Semi Public/ Institutions	15.48				
Residential-Urban	544.70				
Transportation	52.75				
Vegetation / Forest Land	110.28				
Water Bodies / Wetland/river	228.00				
Vacant land	35.78				
Industrial	112.61				
Agriculture	560.98				
Mixed use	24.54				

	Table 9: 2018 Existing landuse within dharohar boundary (source: primary survey)						
LANDUSE	AREA IN HECTARE						
Cantonment	65.30						
Commercial	23.42						
Heritage	102.40						
Public and Semi Public / Institutions	4.51						
Residential-Urban	94.77						
Transportation	9.64						
Vegetation / Forest Land	90.29						
Water Bodies / Wetland/river	180.97						
Vacant land	8.58						
Industrial	0.00						
Agriculture	103.13						
Mixed use	11.76						
Public utilities	14.97						

Public utilities	41.47	
Recreational	28.70	
Reserved forests	170.61	
Residential with cottage industries	58.25	
Waste land	39.15	
TOTAL	2388.95	

Recreational	20.59
Reserved forests	98.15
Residential with cottage	
industries	24.67
Waste land	39.15
TOTAL	892.28



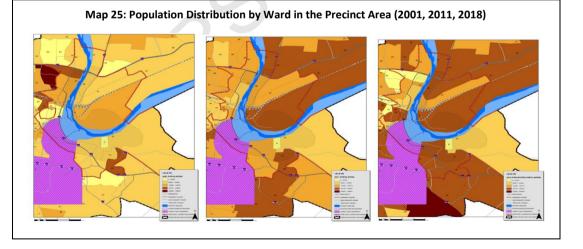


About 10% of the Land within the 'dharohar kshetra' boundary is water body, wetland and river. Agriculture, forest cover and reserve forest comprise about 35% of the landuse. Heritage sites constitute of about 11% while residential covers around 25% landuse of which 10% use also generates incomed through home-based cottage industry (this number may be higher). 5% landuse is industrial. Though the industrial number seems seemingly less in the precinct area, the major industrial belts of Agra like Foundry Nagar and the Nunhai Industrial estate shares boundary with the precinct.

Most of the neighbourhoods in the precinct and the old city are more than 20 years old. The colonies include Kachpura, Taj ganj, Dhandupura, Teli pada, Vibhav nagar, Belan ganj, Moti ganj and Rawat Pada. Majority of these settlements are tenured slums on government land. "As per 2001 census, 56% of Agra lives in slums or slum like settlements." Detailed maps are attached i Annexure 3.

⁴⁵ RAY Slum free city, Agra Study

Table 11: Precinct Ward Level Population Statistics								
SERIAL NUMBER	WARD NUMBER	POPULATION 2001	POPULATION 2011	PROJECTED POPULATION 2018	PROJECTED POPULATION 2038	PROJECTED POPULATION 2050		
1	17	14286	25059	33677	54146	67074		
2	58	11693	19335	25449	39968	49139		
3	42	17538	24663	30363	43901	52451		
4	13	15377	13443	11896	8221	5900		
5	33	13392	9236	5911				
6	44	10005	17100	22776	36257	44771		
7	79	21781	12005	4184				
8	50	78818	15016					
9	14	18385	18072	17822	17227	16851		
10	64	10797	15047	18447	26522	31622		
11	62	11027	15723	19480	28402	34037		
12	66	31303	11416					
13	98	NEW	NEW	NEW	NEW	NEW		
14	91	NEW	NEW	NEW	NEW	NEW		
TOTAL		254402	196115	190005	254644	301845		



As observed from the census data of 2001 and 2011, 26% of the population are concentrated

Map 26: Existing Land-use of Precinct zone. Map 27: Existing Neighbourhoods in the precinct zone

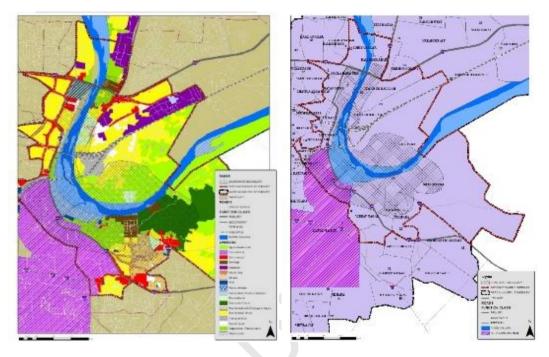


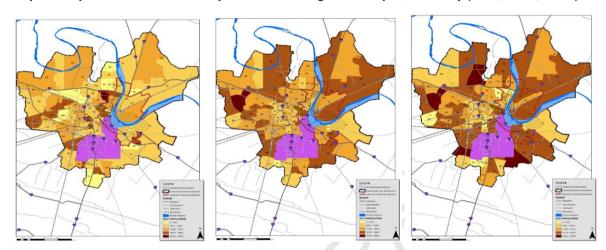
Table 10: Slum Settlement Type in Agra

	Tenure				Land Tenability			
Status	Secure	In secure	Tenable Semi Tenable Non - Te			Non - Tenable		
No. of Slums	345	72	4	05		4	8	
	Age of Slum							
Age	0-15 years More than 20 years			ars				
No. of Slums		8				409		
	Land Ownership							
Ownership	Local Body	State Govern	ment	Raily	vays		Private	
No. of Slums	4	406		1			6	

Source: RAY Primary Survey 2011

in the old city and 12 % in the precinct. However, the settlements in the core and the precinct are very dense and depend on inadequate infrastructures which are below the required standards. As observed from the census data of 2001 and 2011, about 20% of the total population were concentrated in the 14 precinct wards in 2001 and 12% in 2011. The available residential landuse statistics provide the density of 467 persons per hectare in the precinct and 147 persons/hectare in the city. Katra Wazirpura, a colony near itmad-ud-daulah

is the city's largest slum with a population of more than 13000. The RAY survey conducted in 2011, noted that about 56% of the population in Agra lives in slum with an average household size of 6.4.



Map 28: Population Distribution by Ward Within Agra Municipal Boundary (2001, 2011, 2018)

Linear population projection and decadal population projections suggest that by 2050 there will be 30 to 35 lakh population. This increase will create a deficit of 7 lakhs housing units. The impact will affect the precinct residential zones as well.

Ray study of 2011, noted that the total number of dwellings in Agra slums 123846. 94% of these units are Pucca constructions, 4% units are Semi-Pucca and the remaining 2% are katcha constructions. The 94 pucca construction are in dilapidated state and do not have adequate supporting infrastructure.

"Majority of the working population in the slums is engaged in tertiary sector which comprises of wholesale business, informal sector, tourist guides, rickshaw pullers, sweepers, street vendors, preparation of souvenirs such as replica of Taj Mahal and other home based small businesses. On the other hand, women in the families are majorly involved in tertiary activities such as domestic help and in the making of petha. In addition, a certain amount of the slum working population is involved in industrial activities such as shoe making, leather goods and ancillary industries supporting foot wear. On the other hand, slums households located in urban fringe area are involved as agricultural labourers due to the presence of fewer agricultural lands in close proximity."⁴⁶

⁴⁶ RAY SURVEY

Occupational Status

2% 0%

Self-employed

Salaried

Regular wage

Casual labour

Others

Figure 26: Occupational status of slum residents.

Source: RAY Survey

Entire city has 3 water supply zones with 26 sub zones. Parts of the precinct zone do not have water supply connections and they have to depend on tankers, tube wells and hand pumps. Even areas getting the city water supply connection receive poor quality water. 'It is observed that treated water is not fit for drinking as the amount of C.O.D, Fecal Coliform and total Ammonic nitrogen present in it are more than the values as per CPCB standard'⁴⁷. There are two water treatment plants operational in Agra. One in Jeoni Mandi and the other at Sikandra.

The City is divided into 8 sewerage districts: North zone, West zone, Central zone, Tajganj zone, South zone-I, South zone-II, South zone-III and East zone. These 8 districts are further divided into 25 sub zones. "Domestic sewage used to directly enter the Yamuna via several drains before 1995. To check increasing pollution in the river, a plan to establish STPs was made in 1996. In 2001 three plants were developed at Dhandupura 1, Pilikhar and Nagla Budi. Nine sewage pumping stations (SPS) were also made. The total capacity of the STPs at that time was 90.25 million litres per day (MLD). In 2010, on expansion of city and increase in population two more STPs of 26 MLD total capacity were developed at Jagnpur and Devri Road. STP Bichpuri and Dhandupura 2 having total capacity of 64 MLD were established in 2013. The total capacity of seven STPs in Agra at present is 180.25 MLD. In total, the seven STPs are treating only 125 MLD of sewage, while the total capacity is 180 MLD. The capacity of the STP at Dhandupura 1 is 78 MLD, its efficiency is 68.5 MLD. Capacity of plant at Dhandupura 2 is 24 MLD but it treats just 17.39 MLD of sewage. STP Pilikhar is the best performer compared to others, with its efficiency at 9.81 MLD while its capacity is 10 MLD. Nagla Budi has the lowest capacity, at 2.25 MLD and its efficiency is 1.75 MLD. STP Jagnpur with a capacity of 14 MLD treats 12.50 MLD of sewage. The capacity of the Devri Road plant

⁴⁷ Aditi Arora Thesis

is 40 MLD, but its efficiency is 6.99 MLD. Bichpuri STP is the worst performer, with a capacity of 40.9 MLD but treating only 7.5 MLD of sewage. Some plants are old, and also not getting the required supply of water. Repair work is conducted on a regular basis; we are working towards improving output of the plants. But there is requirement of more STPs. The requirement within the next decade will be 300 MLD while the total capacity at present is 180 MLD."⁴⁸ Lack of sewerage network in the eastern zone imposes a serious threat to the river as the sewage generated in this area directly flows into the river. Currently work is on to upgrade the sewerage system of Tajganj.

Table 12: Agra Sewerage districts

S No.	Sewerage Districts	Capacity of STP (in mld)					
		Existing	Under construction	Proposed	Total		
1.	North Zone	16	-	20	36		
2.	West Zone	40	36	-	76		
3.	Central Zone	78	-	-	78		
4.	Tajganj Zone	-	24	-	24		
5.	South Zone – I	-	-	16	16		
6.	South Zone - II	12	-	24	36		
7.	South Zone - III	-	-	14	14		
8.	East Zone	10	-	20	30		

Source: Yamuna Pollution Control Unit, U.P. Jal Nigam, 2012

It is observed that three zone namely Tajganj zone, South zone-I and South zone-III lack STP.

Figure 27: Satellite image showing open drains flowing into the Yamuna



https://timesofindia.indiatimes.com/city/agra/Agras-sewage-treatment-plants-work-below-capacity/articleshow/50488762.cms



Source: Google earth

The storm water system was laid 55 years ago in Agra. These drains are in bad condition, choked and encroached upon by slum dwellers. More than often areas without sewerage system, use these drains for discharging sewage waste which flood into the adjacent slum settlements due to its inadequate carrying capacity, causing unhygienic living conditions and pollution.

Table 13: Agra Drainage Zones

S No.	Name of the Zone	S No.	Name of the Zone
1.	Karamyogi	7.	Kheria
2.	Dayalbagh	8.	Naripura Dewari Road
3.	Shastripuram	9.	Taj Nagari Phase II
4.	City	10.	Foundary Nagar
5.	Mantola	11.	Peelakhar
6.	Taj		

Source : Jal Nigam, Agra

Proximity to social infrastructure in the precinct zone is adequate. Though future population growth suggests some deficits in schools and hospitals.

3.2 ISSUES AT REGIONAL, CITY AND PRECINCT LEVEL

The Taj Trapezium Zone (TTZ) is a 10,400 sq. km area around the Taj Mahal, comprising of five districts of Uttar Pradesh and parts of two districts of Rajasthan. The TTZ has been declared as an "Air Pollution Protected Area" (MoEF, GoI in 1983), due to the presence of world's beautiful monument the Taj Mahal. The TTZ comprises about 40 protected monuments including three World Heritage Sites - the Taj Mahal, Agra Fort and Fatehpur Sikri. The zone also covers many unprotected and unidentified heritage sites which links India with its glorious history. It is a global tourism destination area and offers huge

development potentials with respect to tourism, heritage and tourism-centric city economy. TTZ is so named since it is located around the Taj Mahal and is shaped like a trapezoid49.

3.2.1 Selection of Cities

By the year 2025, around 75% of the world's population will be living in urban areas. The growth of the world population and the increase in the amount of floor space per inhabitant will accelerate land consumption. This continuous pressure on land and resulting urban sprawl will lead to deterioration of infrastructure and services, if appropriate planning and development goals are not set for the region. Out of 120 cities in the TTZ region, about six class I cities shows constant growth in the future and there are about two class II cities that shows a tendency to transformation into class I cities in the future. Apart from this there are two class III cities that has a very high tourist footfall and this increases with time. Therefore, based on the above conditions, the following cities has been selected for detailed planning intervention in the TTZ region. These cities are Agra, Mathura, Firozabad, Shikhohabad, Hathras, Bharatpur, Vrindavan, Tundla, Fatehpur Sikri and Govardhan. The details of all selected cities are given below in table No 2.

Table 1: Selected Cities in the TTZ Region

SN	STATE	DISTRICT	CLASS	Name of Town/City	TOTAL POPULATI ON		JLATION ECTION	AREA (SQ.KM.)	Density (PPH)	Tourist Footfal	Tourist Footfall- Projection
					2011	2018	2050	2011	2011	2017	2050
1	Uttar Pradesh	Agra	I	Agra UA	1760285	2060547	3433174	132.13	133	65929655	383467982
2	Uttar Pradesh	Mathura	I	Mathura UA	456706	550080	976931	38.91	117	6637867	6868764
3	Uttar Pradesh	Firozabad	I	Firozabad (NPP)	604214	724158	1272471	21.35	283		
4	Uttar Pradesh	Firozabad	I	Shikohabad (NPP)	107404	120874	182452	8.48	127		
5	Uttar Pradesh	Hathras	I	Hathras (NPP+OG)	143020	229282	623621	6.76	238		
6	Rajasthan	Bharatpur	I	Bharatpur (M Cl+OG)	252838	405813	1105125	57.77	44	432523	460927
7	Uttar Pradesh	Mathura	II	Vrindavan UA	71688	82185	130172	13.5	53	69278257	36034337
8	Uttar Pradesh	Firozabad	II	Tundla (NPP)	50423	81353	222748	8.25	61		
9	Uttar Pradesh	Agra	III	Fatehpur Sikri (NPP)	32905	35776	48899	8	41	747404	1195927
10	Uttar Pradesh	Mathura	III	Govardhan (NP)	22576	25433	38496	8	28	9607054	22576776

Source: Census 2011; U.P. Tourism Dept. 2017 and Projections

The state of Uttar Pradesh, where Agra and the Taj Mahal are located, experiences electricity blackouts almost daily. This has had a negative effect on the functioning of the sensitive

⁴⁹ Parliament of India Rajya Sabha, Department-Related Parliamentary Standing Committee On Science & Technology, Environment & Forests, Two Hundred Sixty Second Report On Effects of Pollution on Taj, July 2015

pollution monitoring system of the Taj set up by the Uttar Pradesh government. In April 2002, the Supreme Court ordered the Agra Heritage Fund to set up a solar power plant to meet the energy needs of the Taj Mahal and the surrounding area. The industries still located in the Taj Trapezium are taking the assistance of international organisations like USAID to minimize pollution under the Clean Air initiative since 1993. Taj Trapezium Zone Pollution Authority is monitoring this and other such schemes to control pollution in the Taj Trapezium⁵⁰. However, brick kilns, oil refineries and factories, iron foundries, glass, leather and other chemical industries are posing serious threat for the Taj Mahal, the River Yamuna and the settlements in the entire zone.

The issues that can be identified through the primary and secondary sources, at each level have been listed down below.

3.2.2 Issues at the Regional Level

- Most of the cities in the region are a result of unplanned urban growth except for Bharatpur. The growth directions are determined either along the expressways or the river.
- The industries in the TTZ are basically of small and medium scale category with most of them operating in the Firozabad area. Brick kilns, petha, tanneries, iron foundries, glass and other chemical industries which are generally polluting industries are found in the TTZ.
- With growth and development, new Industries are coming up along the expressways that are polluting in nature as well. For eg. Kosi Kalan, Chatta and Nandgaon areas
- There are two proposed land use for development along the expressways in phase II
 (zone 3 and zone 4) that has large industrial hubs coming up within them. There is a
 need to understand the categorisation and type of industries that are being approved in
 the zone as a leather park has been recommended in the proposals along the Agra Ring
 Road.
- Unidentified and unprotected tourist spots in Deeg, Nandgaon, Chhata, etc. needs to be identified with tourist infrastructure and connectivity.
- Increasing number of tourists and pilgrims (five to seven million annually) has stressed the carrying capacity of the cities infrastructure in the region.
- Sources of water supply and quality of water are a huge concern for the region.
- Electricity supply and alternatives being used in industries and residential areas are reasons for pollution and fire hazards in the region
- Solid waste and C&D waste are mostly dumped outside the cities along the highways.
 Open incineration is also practised.
- Brick kilns in the entire region are other sources of pollution
- Agricultural crop burning is also practiced in the region.

⁵⁰ Comprehensive Environmental Management Plan (CEMP) For Taj Trapezium Zone (TTZ) AREA, NEERI report, 2013

- River Yamuna carrying all pollutants from Delhi and downstream is clogging and drying the river.
- Also barrages formed at the end of the cities holds the water along the city but carries only sewerage water beyond the city jurisdiction converting it more into a nallah.

Mathura Vrindavan

Issues of Urban Development & Planning

Land-use/Master-Plan

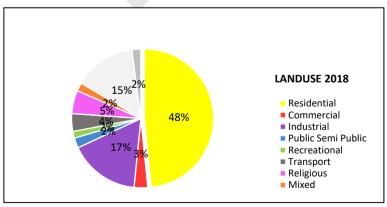
- Areas adjacent to the Market centre and old settlements exhibit dense development due to cluster housing which is because of availability of all services, cultural and religious attractions and work places. This area is under development pressure due to lack of organized growth.
- The land allocated for open spaces is also being consumed by residential development and there is substantial lack of recreational space in the city.
- Public and semi-public areas are considerable less in terms of space allocation indicating lack of social infrastructure and the allotted area being used for different purpose.
- Mixed Land use is observed in many areas within the city, while the commercial activities are not well distributed along the city.
- There is new extensive planned development happening within Vrindavan MC Boundaries and the fringe areas.
- Since the core city and the religious temples are located along the river, there is a
 lot of pressure on housing and infrastructure in the older parts of Mathura and
 Vrindavan. There are many old, unused dilapidated structures that can be found in
 this part of the city.

For landuse details refer to Map 2.11: Existing (2018) Land use Map of Mathura - Vrindavan

Table 2: Mathura Landuse Table

LANDUSE	Existing Land use 2001 (Ha.)	Existing Land use 2001 (%)	Existing Land use 2018 (Ha.)	Existing Land use 2018 (%)	Proposed Land use 2021 (Ha.)	Proposed Land use 2021 (%)	URDPFI Guidelines
Developed Area							
Residential	2,775	35.12	3499.40	48.41	5978.88	43.42	35-40
Commercial	200	2.53	229.15	3.17	345.03	2.51	5-7
Industrial	1440	18.23	1192.20	16.49	1595.76	11.59	4-5
Public Semi Public	963	12.19	170.00	2.35	975.36	7.08	10-12
Recreational	263	3.33	113.20	1.57	1991.68	14.46	10-12
Transport	565	7.15	299.50	4.14	1160.9	8.43	12-14
Religious	439	5.56	391.3	5.41	357.12	2.59	7-10
Mixed	0	0.00	141.51	1.96	0	0.00	
Cantonment	1149.44	14.55	1042	14.42	1149.44	8.35	
Government	105.98	1.34	150	2.08	216.06	1.57	
Total	7,900	100.00	7228.26	100.00	13770.23	100.00	
Undeveloped Area	,						
Forest	286		Balance	Balance	1071.72		Balance
Flood plains, water bodies	1804	C	Balance	Balance	1500.38		Balance
Agriculture	10500	7	Balance	Balance	Balance	Balance	Balance

Figure 28: Mathura Landuse Chart



Source: Primary and Secondary Survey, 2018

 Non-conforming activities: The industrial estate areas exhibit non-conforming residential development. The residential areas exhibit non-conforming commercial and mixed-use development along the major market areas, also leading to encroachments along the road. The open and green spaces are being encroached upon by residential or commercial activities.

Industry

The UPSIDC had set up an industrial estate in Mathura along NH.2. One of the major contributors in the economy of Uttar Pradesh are Mathura Industries. Mathura Refinery located in the city is one of the biggest oil refineries of Asia. This oil refinery of the Indian Oil Corporation is a highly technologically advanced oil refinery. Now, that Mathura has come under Taj Trapezium Zone (TTZ), power starved industries using generators or coal have been banned. This has led to industries shifting out of Mathura to Kosi Kalan, Chatta and Nandgaon and to other states with good infrastructure. The water supplied to industries is brackish in nature and is not potable without treatment. However, 822.92 ha. of land area has been allotted for industrial growth in the Master Plan, in which the oil refinery holds a significant part. So apart from the existing oil refinery, there is still possibility of other polluting refinery industries to come up in the southern part of the city of Mathura, which is a major concern since Mathura refinery is one the biggest source of pollution in the TTZ Area. ⁵¹

For industry details refer to Map 2.12: Location of industries in Mathura Vrindavan

 Textile printing industry is also prominent in Mathura, that includes both sariprinting and fabric dyeing and silver ornaments manufacturing are major industrial contributors to the region. Dye and colour manufacturing industries are sources of pollution. Colour manufacturing in the organized sector or unorganized sector both are carried in a very unhygienic process. Apart from these other industries are water tap manufacturing units and other decorative and household items. Mathura is also

Figure 29: Scale of Industries in Mathura

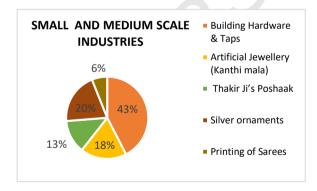


Table 3: Compliance status of industries in TTZ area Mathura City

SI. No.	Category	Total no. of industries	Remarks, if any
1	Red	187	Tiny Industries are 55
2	Orange	37	(Red category)
3	Green	73	
	Total	297	

Source: MSME Profile, Mathura, 2014

a big centre for production of cotton materials. 52

⁵¹ Master plan, 2021

⁵² MSME Profile, Mathura 2014 & DIC, Mathura

 Non - availability of uninterrupted power supply at lower rate, lack of upgraded technology, absence of well formulated State Industrial Policy is some of the prominent issues.⁵³

• Trade and Commerce

Though religious tourism generates the economic base of Mathura and Vrindavan and the small scale and household based industries function primarily to the floating population and inner city needs, they create congestion and unregulated development in the inner parts of the city of Mathura.

For details on commercial areas refer to Map 2.13: Location of major commercial areas in Mathura Vrindavan

- The main economic activities are based on cottage industries, sari printing, and manufacturing of garments (temple related), artificial jewelry, copper utensils, stone engraving, statues, paintings, sweets and offerings. Renowned as the place where rivers of milk flowed, Mathura has a large number of Milk trading centres and known for its milk products like peda and barfi. But these economic activities have not been promoted or endorsed to its fullest.
- The inner city also has several printing presses whereas metal curios and sari printing are subject to bulk orders from other states. These activities largely cause inner city pollution. ⁵⁴
- The commercial activities are not well distributed along the city, creating development pressure on the core city.
- Mixed used activities have emerged in the inner city with shops on the ground floor and residence on upper floors.
- Wholesale trading centres are also located within the city creating congestion and unhygienic situation, covering almost 44 ha of land.⁵⁵

⁵³ Primary and Secondary on field Survey, 2018

⁵⁴ Primary and Secondary Sources,2018

⁵⁵ Master Plan,2021 and Land Use Analysis, 2018

Table 4: Occupational Structure of Mathura

Occupational Structure	2001	2011
	%	%
Primary	1.43	5.70
Secondary	6.45	5.29
Tertiary	92.11	89.01

Source: Census 2001, 2011

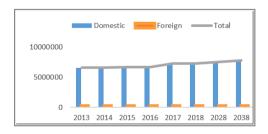
Tourism

- Mathura-Vrindavan are one of the major cities in India for religious tourism. Mathura city has been chosen as one of the heritage cities for Heritage City Development and Augmentation Yojana scheme of Government of India. Vrindavan has become most popular place in Braj Region among foreigners since 2015. But the number of foreign visitors visiting Mathura remains consistent throughout the years. The trend of visiting Braj region is increasing yearly across the world. But if we compare Braj region with other top 15 tourist places, the result shows that Mathura is somewhere lacking in attracting tourists.
- Major issues in tourism are lack of safety and security of tourists, underdeveloped Public transport system, overcrowding of popular tourist centres and lack of sufficient infrastructure.
- Poor health, lack of hygiene and improper sanitation among common people especially in the rural parts of the Mathura pose a big issue for development of tourism sector.

Table 5: Tourist Footfall in Mathura

Table 5. Tourist Footiali ili Matilura							
Year	Domestic	Foreign	Total	Growth			
2013	6600000	24700	6624700				
2014	6620500	24950	6645450	0.31			
2015	6626000	25000	6651000	0.08			
2016	6630000	25100	6655100	0.06			
2017	7226700	26605	7253305	8.99			
2018	7248093	26683.76	7274777	0.30			
2028	7509804	27484.28	7537288	3.00			
2038	7735101	28308.82	7763410	3.00			

Figure 30: Tourist Footfall in Mathura



- Mathura- Vrindavan have around 325 religious and heritage buildings as well as kunds, out of which only 20 are ASI protected.⁵⁶
 - For details on heritage sites refer to Map 2.14:Heritage areas and tourist infrastructure; Accommodation facilities in Mathura Vrindavan
- Traffic in Mathura- Vrindavan in the core areas close to the major temples cause major congestions.
- The accommodation required for 7763410 tourists is 31055 rooms. The current accommodation facilities including around 140 hotels and 200 Dharamshalas, have 14,500 rooms approximately. 16,555 more rooms are required to accommodate the projected tourist population till 2038.⁵⁷

Issues of Urban Settlements Forms and Space

Housing

Areas adjacent to the market center and old settlements exhibit developmental pressure due to lack of organized growth. The peripheral areas have more organized development pattern with infrastructure being relatively in better conditions. According to 2011 census, the total households (HHs) in the city are 59,781 comprising of 349336 populations and the average household size is 6 (5.7). The HHs in 2001 were 47,980 with a population of 302770 and household size of 6 (6.3). The increase in number of HHs indicates the reduction in household size, which is likely to cause housing shortage in future. 58 The housing shortage is calculated as below-

Table 6: Housing Statistics of Mathura

YEAR	1991	2001	2011	2018	2028	2038
POPULATION	283668	380007	528394	632265	780652	929039
HH SIZE CONSIDERED	6	6	6	6	6	5
HOUSEHOLDS	47278	63335	88066	105377	130109	185808
HOUSEHOLDS REQD.	_	16057	24731	17312	24731	55699

Source: Data from Census and Master Plan, 2021

Considering the census data and plan of the city, it is assumed that 15% of the Mathura
city households belongs to either EWS or LIG population out of which around 9% of the
city BPL population lives in slums. The slums are spread all over the city. More than 15
per cent of the population does not have any water facility, 50% houses in slums are pucca
with brick wall, PCC flooring whereas some people live in jhopris. The slums have poor

⁵⁶ BRAJ Corridor Report, UP Tourism,2018

⁵⁷ Calculations based on UP Tourism assumption of 400 rooms/ lakh tourists

⁵⁸ Ray,2014; Census 2011 and Housing Calculations, 2018

sanitary conditions due to clogged drains, poor quality of water supply and the collection of household wastewater in open pits. Slums also lack toilet facility, which results in open defecation.⁵⁹

For details on slums in Mathura refer to Map 2.15 : Location of slums in Mathura Vrindavan

• River Front Development

- The Ghats of the Yamuna River in Mathura and Vrindavan where the evening rituals take place have become a major attraction for a large number of pilgrims every day. Ghats are not cleaned or maintained properly and haphazard new development is coming up all along the Ghats. The water quality is deteriorating at both upstream and downstream locations.
- Construction of barrage holds the untreated water (due to mixing of sewerage in river) in front of the Ghats that has a bad odour and is polluted.

Issues of Urban Services and Infrastructure

Water Supply

Table 7: Mathura and Vrindavan Drinking Water Source

	Total Number of Households	Tap water from treated source	Drinking water from Other Source
MATHURA	55,086	42	58
VRINDAVAN	10,397	71	29

Table 8: Water Supply Demand in Mathura and Vrindavan

Water supply demand- Mathura Vrindavan							
	1991	2001	2011	2018	2028	2038	
Population	283668	380007	528394	632265	780652	929039	
Water Demand (135 lpd)	38.3	51.3	71.3	85.4	105.4	125.4	

⁵⁹ Census 2011 and RAY,2014

Drinking Water Source

Tapwater from treated source

VRINDAVAN

42%

Drinking water from Other Source

Figure 31: Mathura and Vrindavan Drinking Water Source Chart

Source: Mathura Jal Nigam, CDP 2006 and Author

The source of water supply to the city is both surface and underground water. The river Yamuna passing through the city is the source of surface water. However, surface water supply is limited; Mathura is still depending upon the underground sources to a large extent in order to meet the needs of domestic, commercial and also for industrial purpose. Underground sources are utilized through 73 bore wells of different capacities that are able to supply 25 MLD of water. At present the surface water production is 100 MLD at Gokul Barrage, some 15 Kms downstream from Mathura, whereas the NPP is able to supply 10 MLD out of the total production due to insufficient collection and distribution system. Due to shortage of funds, the city network has not been able to tap the full potential of the Barrage. Number of individual tap connections existing in the city are around 22,000 (domestic, commercial, industrial, etc) and these connections are not metered. Dependency on ground water through hand pumps and tube wells is at a large number. Slums are totally dependent on ground water. Connections through piped water supply system is mostly in the Cantonment area of the city. As per estimated calculation for the year 2038, 1 plant of 125 MLD water treatment plant is required considering 135 lpcd water supply. Land requirement for the same is 2.4 Ha⁶⁰. Land requirement for the same is 2.4 Ha.

For details of water supply infrastructure refer to Map 2.16: Water Coverage, Canals, WTP and OHT in Mathura Vrindavan

Sewerage and Drainage

The city does not have an efficient sewerage system. Open sewer drain network collects the waste water and sent them to Sewerage Treatment Plants (STP) for treatment. The inner city septic tanks and sewer networks became defunct due to poor maintenance and the sewer finds the road side open drains and finally discharged into Yamuna River directly causing serious water pollution. Two STPs one at Trans Yamuna area and the other at Vrindavan road area are able to treat sewer of 28.2 MLD.

⁶⁰ Source: Report on status of water supply, wastewater generation and treatment in Class I cities and Class II towns in India, 2009 and Mathura Jal Board,2018

- There are no separate drains for storm water, creating pressure on existing sewer network during rainy season. Thousands of devotees take bath in the river, on an average day which increases by over 1.5 lakhs during certain festival days. The sewage disposal is through existing open drains. Approximately 25% to 30% of the inner city is severed which do not work.
- Therefore, the UA is dependent on septic tanks and open drains. The septic tanks in the Cantonment area better controlled. Pumping stations and sewage treatment plants are provided for part of the sewage generated. The total wastewater flow reaching Yamuna River from Mathura UA is about 26.5 MLD which contributes a pollution load of about 5000 kg/day of BOD to the river.⁶¹

For details on sewerage network refer to Map 2.17: Sewerage Coverage, network, STP in Mathura Vrindavan

Table 9: Mathura and Vrindavan Sewage Statistics

	TOTAL SEWAGE	TREATMENT CAPACITY	DISPOSAL METHOD
MATHURA	40 MLD	90.25 MLD	Disposed in Yamuna
VRINDAVAN	6.33 MLD	4.5 MLD	Disposal on land

Source: City Sanitation Study

Power Supply

Dakshinanchal Vidyut Vitran ltd. provides the electricity to the city. 96% of the area under NPP is provided with electrical supply. Although the connections are sufficient in number, electricity supply is hampered due to frequent power cuts and power failures. Solar energy is not being harnessed for electrical provisions. Hence, dependency on renewable sources is lacking and dependency on other fuels like diesels for generators has increased.

⁶¹ Source: Report on status of water supply, wastewater generation and treatment in Class I cities and Class II towns in India, 2009 and Mathura Jal Board, 2018

0.12 0.19 0.91 1.01

• Electricity
• Kerosene
• Solar Energy
• Other Oil
• Any other
• No lighting

Figure 32: Sources of Power Supply

Source: Census 2011

Around 60% of the city area is without street lights. Only 10% of the area is covered with
adequate street lighting facility of the 40% served area. This leads not only to public
inconvenience but also insecurity and law and order problems.⁶²

Solid Waste Management (SWM)

- The Solid Waste Management (SWM) system along with drainage is the most poorly delivered service by Mathura NPP, due to the lack of proper infrastructure facilities and overall day to day planning and management.
- At present the total solid waste generated in the city is around 145 MT per day. Due
 to the lack of infrastructure and manpower capacities only around 54 MT of garbage
 is lifted per day which accounts for around 40% of the total waste generated in the
 city.
- Also due to the inefficient SWM handling system, the wastes often get into the drains.
 There are more than 200 dairies in the city which contribute to cow dung waste in large quantities, being directly disposed in open drains and nallas.
- Domestic waste is the major source of waste generation in the city. The households, shops do not store the waste at source nor do they segregate the waste as recyclable and non-recyclable waste.
- There are no other proper landfill sites and presently the waste is dumped in open sites. The city does not have garbage bins and often the garbage is thrown on the roadside. The disposal of the garbage is being done in unscientific way, as the single disposal site is around 7 kms away from the city.
- Most of the important tourist and heritage sites has municipal waste lying around its areas, creating eye sore and foul smell to the people near such areas.⁶³

⁶² Primary and Secondary Sources, 2018

⁶³ Mathura Water and Waste Profile, 2007; CDP, 2006 and Analysis, 2018

• Open and Recreational Areas

1.6 % of Land is available for Recreational Purpose but as per the guideline 12-14 % of land is recommended for recreational use. The built to open ratio in the core city is very less, and the character is indicated by dense settlement and becomes sufficient towards the outer city, having new development. The recreational area is currently being encroached by other land use.⁶⁴

For details on open and recreational areas refer to maps , Map 2.18 : Location of Green spaces and water bodies and Map 2.19: Open Built relationship map, Mathura Vrindavan

Firozabad - Shikhohabad

There are few glass based industries manufacturing mainly glass bangles, glass beads, glass rods, glass tubes/shell, glass wares and glass blocks. DG sets are installed in almost all the glass industries in Firozabad District, which are mostly based on gas.⁶⁵ The land assigned around the industries are experiencing an intense mix residential growth that is not suitable for a liveable city. Since Firozabad is part of Taj Trapezium Zone, hence development of any polluting industry in the area is prohibited, new and old glass industries are being shifted to Shikhohabad which is now growing as an industrial hub. Major commercial areas in the city consists of mixed use lanes of commercial and residential characters mainly bangle-making household industries⁶⁶. This is creating congestion and unliveable conditions for the people.

Issues of Urban Development and Planning

• Land-use and Master Plan

 As per census of India 2011, total area of Firozabad (NPP) is 21.35 sq km. There is a Current Master Plan of Firozabad-Shikhohabad for 2031. All Master Plans prepared in 2001 and 2010, gives a perspective that there has been a decrease in the industrial, transportation and commerce sector, while an increase in the public and semi-public sector can be noted.

⁶⁴ Mathura Water and Waste Profile,2007; CDP,2006 and Analysis,2018

⁶⁵ Parliament of India, Rajya Sabha Department-Related Parliamentary Standing Committee On Science & Technology, Environment & Forests Two Hundred Sixty Second Report On Effects of Pollution On Taj, July 2015

⁶⁶ Primary and Secondary Surveys 2018

Table 10: Ferozabad-Shokhohabad 2001 Land use

	Area (Ha)	Percentage (%)	URDPFI
Residential	925	52.2	43-48
Industrial	370	20.09	7-9
Trade and Commerce	83	4.7	
Public-Semi Public	42	2.5	6-8
Park and Recreational	100	5.6	12-14
Government Offices	30	1.6	
Transportation	223	12.5	10-12
Total Proposed Area	1773	100	

Table 11: Ferozabad-Shokhohabad 2010 Land use

	Area (Ha)	Percentage (%)	URDPFI
Residential	1377.53	65.15	43-48
Trade and Commerce	37.95	1.79	
Industrial	290.05	13.72	7-9
Institutional	122.62	5.8	
Public-Semi Public	92.73	4.39	6-8
Transportation	162.69	7.69	10-12
Park and Recreational	10.75	0.51	12-14
Other Use	20.19	0.95	

Figure 33: Ferozabad-Shokhohabad 2001 Land use

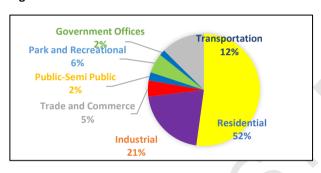


Figure 34: Ferozabad-Shokhohabad 2010 Land use

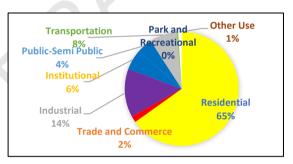


Figure 35: Ferozabad-Shokhohabad 2018 Land use (through primary survey)

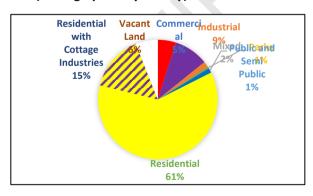
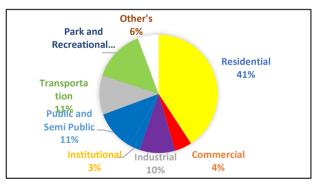


Figure 36: Ferozabad-Shokhohabad Projected 2031 Land use



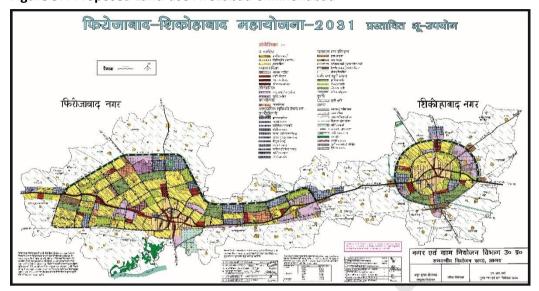
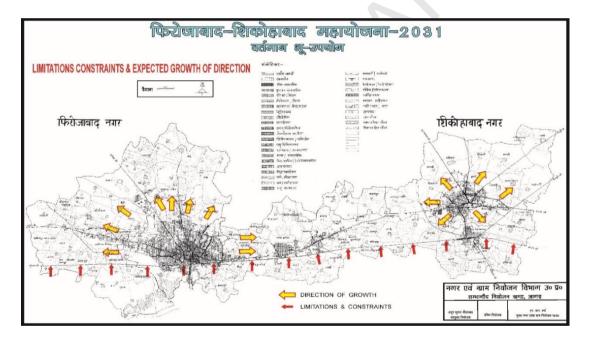


Figure 37: Proposed Land-use Firozabad-Shikhohabad



- The expected growth of Firozabad is towards Northern direction along Jalesar Road, Kotla Road and Saanti Road. No development growth is proposed along South Direction of Railway line⁶⁷.
- The core area of Firozabad development consists of mixed use of Residential and Cottage Industries (Glass Industries). Core area of city is very congested and all households having glass industries are living in unhygienic and the pollution creating form it is affecting the health of workers⁶⁸.

⁶⁷ FIROZABAD_-SHIKOHABAD_MAHAYOJNA-2031.

⁶⁸ Primary and Secondary Surveys 2018

 The workers working in extreme high temperature condition which are affecting their health.⁶⁹

Figure 38: Adverse working conditions of the Ferozabad glass factory workers



Industry

 Firozabad is an Industrial Town and major Industry here is Glass Industry. The breakup of various types of Industries in the District is as follows:

Table 12: Type of Industries in Firozabad-Shikhohabad

SI No.	Type of Industry	No. of Units	Employment	Percentage (%)
1	Agro Based	110	880	1
2	Readymade Garments & Embroidery	53	270	1
3	Wood/Wooden based furniture	276	890	3
4	Paper & Paper based products	37	232	0
5	Leather Based	5	45	0
6	Chemical/Chemical Based	11	95	0
7	Rubber, Plastic & Petro Based	6	43	0
8	Mineral Based	653	5227	7
9	Metal Based (Steel Fab)	137	995	1
10	Engineering Units	120	935	1
11	Electrical machinery and transport equipment	7	65	0
12	Repairing & Servicing	3384	15997	33
13	Glass & Glassware	5246	40126	52
14	Misc.	75	1000	1
	Total	10120	66800	

Source: Brief Industrial Profile of District FIROZABAD 2014 and MoEF categorization of Industries 2016

⁶⁹ Primary and Secondary Surveys 2018

- The existing industries does not have safety measures.
- o The waste generated by industries are not getting treated properly.
- The pollution generated by industries present in core area are effecting the health of residential areas.
- The air quality of Raja-Ka-Tal (industrial Area), Tilak Nagar (residential area) and DIC (Mixed use) are very low⁷⁰.

INDUSTRY CATEGORIZATION

50000 Orange, 45396

40000 White, 17267

10000 Red, 300 Green, 890

0 Red Orange Green White

Figure 39: Categories of Industries in Firozabad

Source: Brief Industrial Profile of District FIROZABAD 2014 and MoEF categorization of Industries 2016

- The existing industries does not have safety measures.
- o The waste generated by industries are not getting treated properly.
- The pollution generated by industries present in core area are effecting the health of residential areas.
- The air quality of Raja-Ka-Tal (industrial Area), Tilak Nagar (residential area) and DIC (Mixed use) are very low⁷¹.





⁷⁰ CSIR-NEERI report 2016

⁷¹ CSIR-NEERI report 2016

Figure 41: Encroachment of shops along road



• Trade and Commerce

- Major commercial areas in the city consists of mixed use lanes of commercial and residential characters mainly bangle-making household industries. This is creating congestion and unliveable conditions for the people⁷².
- The shops are encroaching the roads which are creating congestion and traffic problems
- Encroachment on Footpaths

Issues of Urban Settlements Forms and Space

Housing and Confirming / Non Confirming activities

- The current land-use doesn't conform to the Proposed Land-use of 2031. Current residential areas are 61 % which is higher than the proposed Land-use and URDPFI guidelines.
- New Industrial Zones to be set-up as per the proposed Master Plan.

A. Issues of Urban Services and Infrastructure

Water Supply

 In the city, total number of water supply connections are 40741, which is only 39% of the total required water supply coverage.⁷³

⁷² Primary and Secondary Survey 2018

⁷³ City Sanitation Plan 2016, Firozabad

- Total water required at the city is 93.80 MLD and the water supplied in the city is 57.44 MLD which accounts to 9.4 lpcd which is from ground water sources, (power pumps) 125 tube wells are located in various parts of the city.⁷⁴
- There are 1110 hand pumps in the city, 15% of water supplied is NRW.

• Sewerage and Drainage

- Total sewage generated at Firozabad is 45.95 MLD. At present only 20% (147 km) area covered by the sewer network remaining 563 km needs to be covered with Sewer supply⁷⁵
- There is no waste water treatment facility in the city, Sewer Treatment Plant is required.

• Solid Waste Management

- Total Solid Waste Generated in the city 725.06 MT only 40 to 50% of the waste is collected by Nagar Nigam.
- Door to door collection of Solid Waste is not there
- o Proper Landfill Site is required.
- Open dumping can be seen at many places.

• Recreation and Parks

- Vacant plots are treated as dumping sites.
- o Breathing space require to absorb pollution is not available in the city
- As per master Plan 2031, 14% of Parks and recreational areas has proposed only in outskirt of city, the core area needs to develop green areas. And only 6% vacant land is available within city which is quit challenging to provide 14% of Green Spaces.

Hathras

Issues of Urban Development and Planning

Land Use

- Commercial areas exhibit a great degree of unregulated development. Land allocated for residential development is now experiencing non – conforming residential development. Mixed use development is also observed in commercial areas.
- The land allocated for open spaces is also being consumed by residential development.

⁷⁴ City Sanitation Plan 2016, Firozabad

⁷⁵ City Sanitation Plan 2016, Firozabad

• Residential development is also seen in industrial estate areas.

Table 14: Existing and Projected Pollution of Hathras

LANDUSE	Existing Land use 2018 (Ha.)	Existing Land use 2018 (%)	Proposed Land use 2023 (Ha.)	Proposed Land use 2023 (%)	URDPFI Guidelines
Developed Area					
Residential	734	57.5	1860.82	51.11	43-48
Commercial	76.5	6	92.27	2.54	4-6
Industrial 57.4		4.5	256.13	7.04	7-9
Public Semi Public	102	8	316.80	8.7	6-8
Recreational	95.7	7.5	499.78	13.73	12-14
Transport	127.6	10	402.69	11.06	10-12
Mixed	44.6	3.5		0	
Government	38.3	3	211.93	5.82	
Total		100		100	
Undeveloped Area					
Agriculture		Balance		Balance	Balance
Water Bodies		Balance		Balance	Balance

Source: Master Plan 2021, Hathras, Land use Survey 2018 and Calculations based on URDPFI Guidelines

Industry

- After the introduction of Taj Trapezium Zone, the workforce under the secondary sector has decreased significantly. Chemical and chemical based, oil-based industries and brick kilns are still illegally operating, even though they are banned under the TTZ notice.
- Dye and colour manufacturing industries are major sources of pollution. Colour manufacturing in the organized sector or unorganized sector both are carried in a very unhygienic process. There are many unregistered units running in a scattered way and many workers from the city and the region are dependent on these industries.
- Non availability of uninterrupted power supply at lower rate, poor road connectivity, lack of upgraded technology, absence of well formulated State Industrial Policy is some of the prominent issues.76

⁷⁶ Primary and Secondary Surveys, 2018

Table 15: Occupational structure of Hathras

Occupational Structure (%)	1971	2001	2011
Primary	8.51	6.12	5
Secondary	27.93	7.2	8
Tertiary	63.56	86.68	87

Table 16: Industry Category Statistics of Hathras

Industry Category	Number
Red	8
Green	14
White	129

Source: Census of India 2011; District Industrial Centre 2013, Hathras

Tourism

 The city is known for its Baghs and Baghichis which have now been encroached upon by other activities. There is a need to revive these lush green and open spaces. Conservation and revival of the prominent temples are also required.

Issues of Urban Settlements Forms and Space

- Housing and conforming/Non-conforming activities
- Lot of Illegal housing colonies is coming up in the outskirts of the city due to lack of formal housing supply.
- With the increase in population to 7.25 lakhs in 2051, nearly 1.2 lakhs houses will be required to accommodate them.⁷⁷

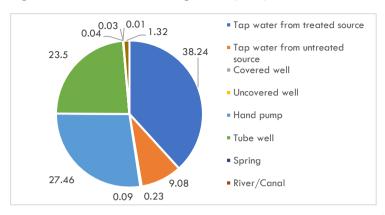
Issues of Urban Services and Infrastructure

Water Supply

- The current water supply is not sufficient to fulfil the demand of the existing population. Ground water is a dependable source of water supply in the city.
- The major sources of drinking water are "tap water from treated source", "hand pump" and "tube well". As the percentage coverage from tap water is still less (38%), people rely on hand pumps, tube wells and other such ground water sources for water supply. This has resulted in tremendous decrease in ground water levels in past few
- As per estimated calculation for the year 2050, 13 MLD water treatment plant is required considering 70 lpcd. Supply of water. Land requirement for the same is 0.2 Ha.

⁷⁷ Census 2011, Primary Survey and Housing Calculation 2018

Figure 42: Sources of drinking water (in %)



Source: Institute of Social Science, 2011

Table 17: Projected Water Demand

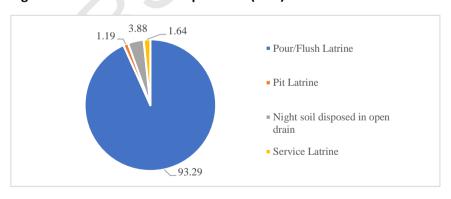
Year	1981	1991	2001	2011	2018	2028	2038	2048	2050
Capacity	6.5	8	8.6	9.5	10	11	11.8	12.7	12.8

Source: UDPFI Guidelines and Calculations 2018

• Sewerage, Drainage

 According to Census Data, 81% of the households have latrine facilities within the premises, whereas 19% of the households are dependent upon public latrines and open defecation.

Figure 43: Latrines within the premises (in %)



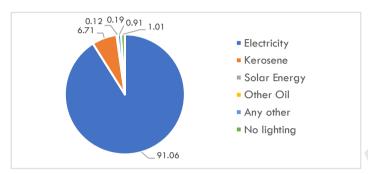
Source: Institute of Social Science, 2011

- The Drainage System is both open and closed. Sufficient facility of pour/flush latrine is observed.
- There are sewage pumping stations and one sewage farm, but not adequate sewage treatment plants.
- Disposal of garbage and waste in open nallahs and drainage system resulting in clogging.
 Solid Waste is also being disposed-off in the drains.

Power Supply

- o The power supply of Hathras city is being majorly provided by the State Electricity Board.
- Although the connections are sufficient in number, electricity supply is hampered due to power cuts and power failures. Therefore, there is a need to encourage alternative sources of energy such as solar power plants and other such technologies.

Figure 44: Sources of power supply (in %)



Source: Institute of Social Science, 2011

Figure 45: Issues Regarding Infrastructure



Solid Waste Management

 There is no proper segregation and regular collection of garbage. It is being dumped on the roadside or upon vacant land parcels in the vicinity. Absence of landfill sites, insufficient capacity of the dumping ground is causing difficulty in managing solid waste. This condition has led to unhygienic conditions.

• Open and Recreational Areas

 The built to open ratio is less as the land is being encroached upon by other developments and activities.

Bharatpur

The city of Bharatpur is experiencing certain grave issues, which are causing hindrance to the growth of the city. In spite of having prominent aspects of growth potential, the city is unable to develop due to various issues prevalent within the city. Non-conformity in Land use is a prominent problem. Also, the city has great tourist potential. Keoladeo National Park and Bharatpur fort are the major tourist attractions. But, due to their poor maintenance, they are not contributing as per their potential.⁷⁸

Issues of Urban Development and Planning

Land use

LANDUSE	Existing Land use 2018 (Ha.)	Existing Land use 2018 (%)	Proposed Land use 2023 (Ha.)	Proposed Land use 2023 (%)	URDPFI Guidelines
Developed Area					
Residential	1885.2	60	2190.8512	46.24	43-48
Commercial	125.68	4	250.1664	5.28	4-6
Industrial	377.04	12	236.4262	4.99	7-9
Public Semi Public	157.1	5	491.8044	10.38	6-8
Recreational	188.52	6	506.4922	10.69	12-14
Transport	314.2	10	930.0694	19.63	10-12
Mixed	47.13	1.5	0	0	
Government	47.13	1.5	77.2294	1.63	
Total	3142	100	4738	100	
Undeveloped Area					
Agriculture		Balance		Balance	Balance
Water Bodies		Balance		Balance	Balance

Source: Land Use Analysis, 2018; Bharatpur Master Plan 2023

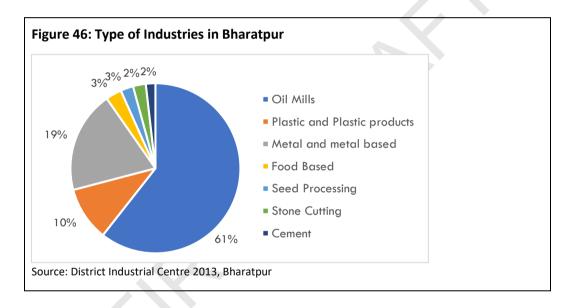
 As per Master Plan 2023, the city should experience growth in all directions except the Southern direction due to the presence of Keoladeo National Park. Also, there are traces of salty and water-logged areas in the southern direction which makes it unfit for construction. But in spite of the above stated facts, the vacant lands and waterbodies are being used for construction purpose.

⁷⁸ Primary and Secondary Surveys, 2018

• The core area of the city is quite dense, unorganised and exhibits unplanned residential area. It has narrow lanes, insufficient open spaces and mixed use land development⁷⁹.

• Industry

- The economy of Bharatpur district is dependent to a large extent on agriculture and its products. The main crops grown are wheat, mustard, cotton, red-chillies and potatoes.
 Therefore, there are more than 100 oil mills in Bharatpur due to mustard grown in large quantity in the surrounding areas. These mills are polluting in nature.
- Stone and building construction materials shops are very common that leads to air pollution.
- Due to the closing of prominent industrial units, a negative impact has been observed in the population growth of the city which has resulted in decreased workforce in the secondary sector.



As evident from the chart, around 61% of the industries are oil mills or oil refineries. The
next in line are industries related to plastic and metal works. According to the
categorisation given by the pollution control board, these industries fall in the red
category, therefore generating environmental concerns.⁸⁰

⁷⁹ Primary and Secondary Surveys, 2018

⁸⁰ Primary and Secondary Surveys, 2018

Table 19: Occupational Structure of Bharatpur

Occupational Structure	1971	2001	2011
	%	%	%
Primary	11	4.75	5.5
Secondary	28.08	30.5	27
Tertiary	61	64.75	67.5

Table 20: Industry Category in Bharatpur

Industry Category	Number
Red	158
Green	14

Source: Bharatpur Master Plan 2023, Census 2011, District Industrial Centre 2013, Bharatpur

Tourism

Bharatpur has a potential to be developed as a tourist destination, but the number of existing accommodation facilities are inadequate to meet the needs of the tourist inflow.

Table 21: Current accommodation facilities

TYPE OF	NO. OF	NO. OF
ACCOMMODATION	ROOMS	BEDS
HOTELS	84	2206
PGHs	9	95
TOTAL	93	2301

Table 22: Projected accommodation facilities

PROJECTED TOURIST INFLOW 2038	TOURIST PER DAY	NO. OF BEDS REQUIRED AT A TIME (AVG STAY = 2 DAYS)
360901	989	1978

Figure 47: Tourist Projections for Bharatpur



Source: Secondary Data and Tourism Projections 2018

 Keoladeo Ghana Bird Sanctuary which is declared as a World Heritage Site needs maintenance and protection. Also, the Bharatpur Fort is another tourist attraction in the city. The current status of accommodation suggests that the number of beds are 2301. As per the projections, the requirement is of around 1980 beds. This suggests that the infrastructure is there but the services are not being met because of low tourist footfall. There is a need to properly utilise the tourist potential of the city.⁸¹

Issues of Urban Settlements Forms and Space

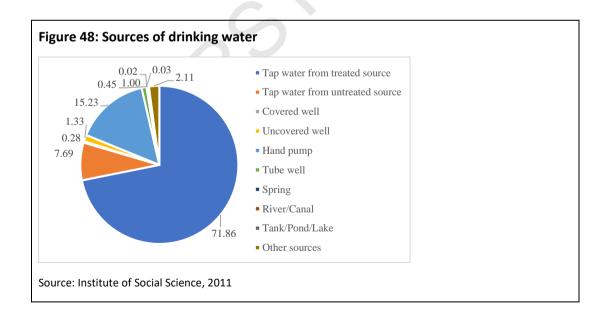
Housing and conforming/Non-conforming activities

- The walled city and the immediate core area of the city are quite dense, unorganised and exhibits organic residential growth. It has narrow lanes, insufficient open spaces and mixed-use land development.
- In 2051, Bharatpur will require a total of 1.9 lakhs dwelling units to accommodate its 11 lakhs population.⁸²

Issues of Urban Services and Infrastructure

Water Supply

- The current water supply is not sufficient to fulfil the demand of the existing population.
 The existing water supply system comprises mainly of asbestos cement pipes.
- The government of Rajasthan has planned to supply water to the water deficit parts of Bharatpur district from Chambal River Project. This project has been proposed for supplying drinking water to urban and rural areas of Alwar district from Chambal river,



⁸¹ Primary and Secondary Surveys 2018

⁸² Primary and Secondary Surveys 2018

- but now it is desired by the government to include water supply to remaining areas of Dholpur and Bharatpur district also from the proposed system.⁸³
- As evident from the chart, tap water from treated source is the main source of water supply in the city (around 72%). The other prominent sources are "hand pump" and "tap water from untreated source".
- As per estimated calculation for the year 2050, 59 MLD water treatment plant is required considering 135 lpcd. Land requirement for the same is 1 Ha.

Table 23: Projected water demand

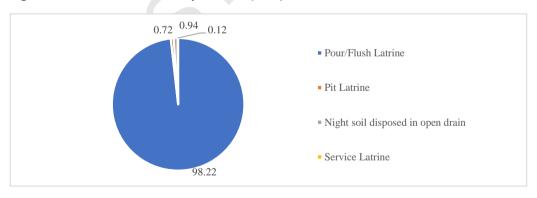
YEAR	1981	1991	2001	2011	2018	2028	2038	2048	2050
CAPACITY	14.2	21.2	27.6	34.1	38.6	45.0	51.5	57.9	59.2

Source: URDPFI Guidelines Vol I-2014 and projections 2018

Sewerage and Drainage

The existing sewerage system covers only 18% of the current population. As per Census 2011, 78% households are equipped with latrine facilities within the premises while the 22% households are dependent upon public latrines and open defecation. The sewerage system majorly constitutes of septic tanks.

Figure 49: Latrines within the premises (in %)



Source: Institute of Social Science, 2011

 There is no proper sewerage and drainage system. The city majorly constitutes of open drains which due to its inadequate carrying capacity, tends to overflow, especially during

⁸³ http://www.pdcor.com/watersupply.htm

⁸⁴ Primary and Secondary Survey 2018

- the rains. The overflowing water floods the roads and causes hindrance in transits. It also mixes up with garbage dumped in the open and thus, causes unhygienic conditions.⁸⁵
- Under the AMRUT scheme by the Govt. of India, a sewerage line of 116.33 km and one STP of capacity 5 MLD is under construction. This would give a total of 16185 property connections. The location of the STP is near Ikaran Village, adjacent to existing STP.⁸⁶

Power Supply

- The power supply of Bharatpur city is being majorly provided by the Vidyut Vitaran Nigam Limited".
- Although the connections are sufficient in number, electricity supply is hampered due to power cuts and power failures. Therefore, there is a need to encourage alternative sources of energy such as solar power plants and other such technologies.⁸⁷

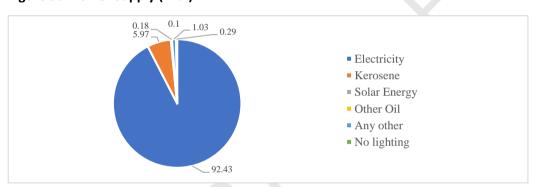


Figure 50: Power Supply (in %)

Solid Waste Management

- There is no proper segregation and regular collection of garbage. It is being dumped on the roadside or upon vacant land parcels in the vicinity.
- Absence of landfill sites, insufficient capacity of the dumping ground is causing difficulty in managing solid waste. This condition has led to unhygienic conditions.⁸⁸

• Open and Recreational areas

⁸⁵ Primary and Secondary Survey 2018

⁸⁶ AMRUT Report, 2018

⁸⁷ Primary and Secondary Surveys 2018

⁸⁸ Primary and Secondary Surveys 2018

 The built to open ratio is less as the land is being encroached upon by other developments and activities. Currently, works for development and beautification of parks and open spaces is being carried on under the AMRUT scheme.⁸⁹

Tundla

Augmentation of Mathura-Tundla oil pipeline has been envisaged. The pipeline would cross various non-perennial rivers, canals, National/State Highways, railway lines, major roads and other water bodies. The entire pipeline route from Tundla to Gawaria would traverse through 7 districts of Uttar Pradesh viz. Agra, Firozabad, Mainpuri, Etawah, Auraiya, Kanpur Dehat & Kanpur Nagar. The terrain along the pipeline route is predominantly flat. But an EIA study has not been considered⁹⁰. Unplanned new development and growth can be seen in and around the city. Inadequate physical infrastructure and management can be well observed within the city.

Issues of Urban Development & Planning

Land-use/Master-Plan

Table 24: Land Use 2018				
LAND USE 2018	Area HA	% of land use	Area	As Per URDPFI Guidelines (%)
RESIDENTIAL	242.96	40.81	2429611	45-50
COMMERCIAL	21.46	3.60	214611	2-3
PUBLIC & SEMI-PUBLIC	15.60	2.62	155950	6-8
RECREATIONAL AND OPEN SPACES	70.02	11.76	700168	12-14
AGRICULTURE	242.64	40.76	2426358	Balance
WATER BODY	2.68	0.45	26751	Balance
TOTAL AREA	595.34	100.00	5953449	

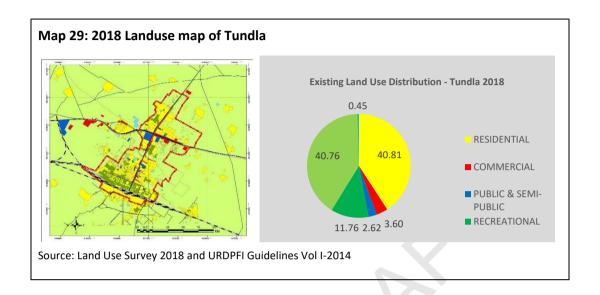
Source: Land Use Survey 2018 and URDPFI Guidelines Vol I-2014

- Tundla despite being a renowned railway junction, is facing unplanned and unregulated development in and around the city.
- The city does not have a Master Plan.
- The land-use analysis of 2018 shows that the city is mainly driven by the residential sector and the demand for more housing facilities are actually eating up the open spaces,

⁸⁹ AMRUT Report, 2018

⁹⁰ Projects: Augmentation of Mathura Tundla Pipeline (MTPL)

agricultural land and the water bodies within and on the fringes of the city. 91 This shows that the city lacks in regulations and controls over development in the city. 92

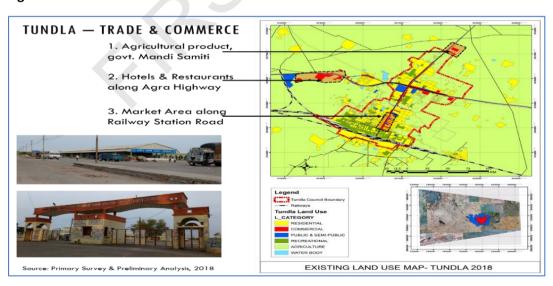


• Economic Base

 Augmentation of Mathura-Tundla oil pipeline has been envisaged. But an EIA study has not been considered.

Commerce

Figure 51: Tundla trade and commerce issues



⁹¹ Land Use Survey 2018 and URDPFI Guidelines Vol I-2014

⁹² Primary and Secondary Surveys 2018

- About 2.265sq. km of commercial area in Tundla NPP is found to be in sync with URDPFI Guideline 2014. However, new Govt. Agriculture based Mandi Samiti has been developed along Tundla Awagarh road that is inaccessible⁹³.
- A lot of land is being used for development of the White Industry I.e. Hotels and Restaurants along Agra Highway that needs to be regulated and monitored.
- The commercial market in front of the Railway Station has planning and developmental issues leading to congestion.⁹⁴

• Tourism

Company Bagh and residence in Railway Colony are unprotected heritage sites. Tundla Church is State protected monument but with no plans to monitor. As per primary survey, the tourist inflow is negligible⁹⁵.

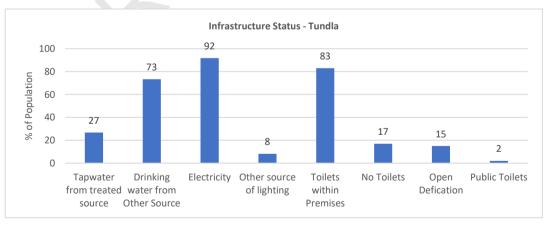
Table 25: List of Heritage structures in Tundla as follows

Site	Tangible/ Intangible	Protection status	Typology of tangible asset	Sub Typology 1	Historical (period)	Ownership
Tundla Church	Tangible	State Protected	Religious	Church	19th C	Public
Company Bagh	Tangible	Unprotected	Social Infrastructure	Garden	19th C	Public
Residences in Railway Colony	Tangible	Unprotected	Residential	Residence	19th C	Private

Source: Primary and Secondary Surveys 2018

A. Issues of Urban Services and Infrastructure:

Figure 52: Showing Status of Infrastructure in Tundla



Source: Indian Institute of Social Studies 2017

⁹³ Primary Survey 2018 and URDPFI Guidelines 2014

⁹⁴ Primary and Secondary Surveys 2018

⁹⁵ Primary Land Use Survey 2018 and Secondary Survey 2018

The overall infrastructure quality and quantity at Tundla is very low and is deficit in many areas like tap-water from treated sources, lack of public toilets, lack of SW management, no sewer lines. etc.⁹⁶

Water Supply

- As per census 2011, only 27% of Households have drinking water supply from Nagar Palika Parishad. 73% of Households uses other sources of drinking water such as well, hand-pump, tube-well, Borehole, spring, River, Canal, Tank, Pond, and Lake etc⁹⁷.
- As per URDPFI Guidelines 2014, cities provided with piped water supply with existing/contemplated sewerage system requires maximum 135 lpcd water supply. Based on above guidelines, the required water supply for present and projected population is given below. As per the estimated calculation for 2018, 10 MLD WTP is required if 135 lpcd water supply is provided in Tundla. The land required for installing 10 MLD Water Treatment Plant is 0.19 hectares, as per the guidelines.

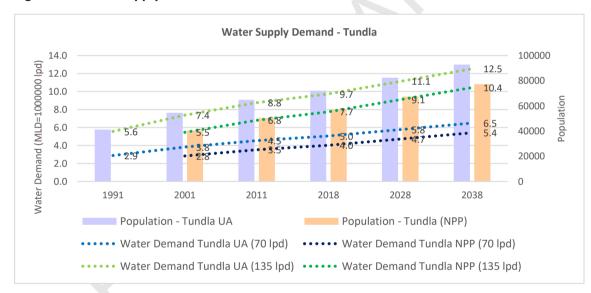


Figure 53: Water Supply Demand for Tundla

Source: URDPFI Guidelines 2014 and projection calculations 2018

Power Supply

• As per Census 2011, around 92 % of total population has electricity supply. 8% of population depends upon other source like Kerosene, Solar energy, other oil, etc. But the

⁹⁶ Indian Institute of Social Studies 2017

⁹⁷ Census 2011

supply of power is irregular and not frequent. Therefore, alternative use of fuels like diesel generators, coal, etc. are being used, which is polluting in nature. 98

• Open and Recreational Areas

About 11.76 % of land is for recreational and open spaces but as per the URDPFI guidelines, 12-14 % of land is recommended for recreational use. Most of the green areas are in and around Railway Station Colony⁹⁹.

Fatehpur Sikri

There is an increasing number of tourist coming to the city with inadequate tourism infrastructure. There is a dearth in the number of hotels and accommodation facilities in the area. The walled city has no planned development with missing walls and Gates (entry points). Many new developments with mixed land use character is coming up. Residential and small-scale industries of carpet making are concentrated all around the city. Absence of physical infrastructure, dependency on ground water and polluting industries are other issues of the city. ¹⁰⁰

Issues of Urban Development & Planning

- Land-use/Master-Plan
- Fatehpur Sikri Development Plan and Master Plan is unobtainable.
- The land use analysis for the current year shows that it is predominantly a heritage site
 that has unregulated and unplanned development happening all around the city.¹⁰¹

⁹⁸ Census 2011 and Primary Survey 2018

⁹⁹ URDPFI Guidelines 2014 and Primary Survey 2018

¹⁰⁰ Primary Surveys 2018

¹⁰¹ URDPFI Guidelines 2014 and Primary Survey 2018

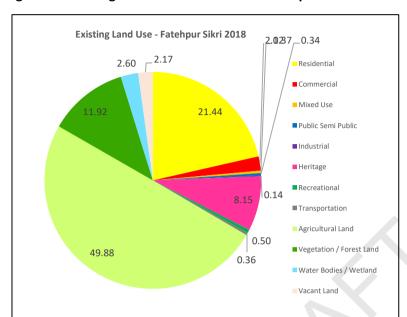


Figure 54: Existing Landuse Distribution of Fatehpur Sikri

Table 26: Land Use Analysis 2018

Land Use	Area (Ha)	%	Land use for small cities as Per URDPFI Guidelines
Residential	147.47	21.44	45-50
Commercial	14.55	2.12	2-3
Mixed Use	2.54	0.37	2-3
Public Semi Public	2.35	0.34	6-8
Industrial	0.93	0.14	8-10
Heritage	56.04	8.15	Balance
Recreational	3.42	0.50	12-14
Transportation	2.49	0.36	10-12
Agricultural Land	343.12	49.88	Balance
Vegetation / Forest Land	82.02	11.92	Balance
Water Bodies / Wetland	17.90	2.60	Balance
Vacant Land	14.96	2.17	Balance
Total Area (Ha)	687.83	100.00	100

For details on landuse refer to Map 2.61: Existing Land Use – Fatehpur Sikri 2018

Figure 55: Development around Heritage Monuments without buffer zone damaging the heritage sites.



Source: Primary Surveys

Figure 56: Weaving Household Industries



Figure 57: Waste water from leather Industry and Dye Industry



Industry

- The Household industries of Carpet are all around spread in the city which are of export quality. These industries have potential to contribute in economic growth and generate more employment in the region. The skills are only transferred from one generation to another. There is no skill building opportunities or promotional facilities that are being offered to this industry.
- Often weaving of carpets are done in an unhygienic condition with age old technology¹⁰².
- The industrial waste is directly getting mixed with the drainage without treatment.

Commerce

• The unprotected Market and Chahr Suq are living heritage sites that lacks identification, planning and protection.

• Tourism & Heritage

 According to Research conducted by surveying tourist perspective in 2015, the Fatehpur Sikri needs to be well connected with Agra as 70% of the tourists come from Agra and

¹⁰² Primary and Secondary Surveys 2018

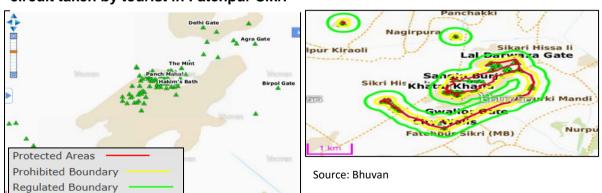
- the tourist infrastructure has to increase. 70% tourists feel that Fatehpur Sikri lacks in terms of connectivity and Infrastructure¹⁰³.
- Around 45% of tourist travel by chartered buses, 25% of tourists travel by train and 30% of tourists travel by private. Around 40% tourists were unsatisfied with the transportation services. The public transport system has to increase to connect tourist places. 40% of tourists indicated that many entrances to the Empirical Complex are not open to public¹⁰⁴.
- As per the estimated calculation and projections, the tourist inflow rate is gradually decreasing based on trend. The domestic tourist inflow rate is increasing but

Tourist Footfall- Fatehpur Sikri 150 2000000 Percentage of Tourists 100 95 80 100 1500000 Population 35 31 50 1000000 500000 2038 Total -50 FOREIGN INDIAN

Figure 58: Tourist Footfall in Fatehpur Sikri

Source: Uttar Pradesh Tourism 2015

international tourist inflow rate is decreasing. The city lacks tourist infrastructure is one of the main concerns¹⁰⁵.



Map 30: Gates and location of heritage sites in Fatehpur Sikri and the internal circuit taken by tourist in Fatehpur Sikri

¹⁰³ Fatehpur Sikri: A Utopian Approach to Urban Planning and Design; Rajinder S. Jutla, Southwest Missouri State University, USA

¹⁰⁴ Fatehpur Sikri: A Utopian Approach to Urban Planning and Design; Rajinder S. Jutla, Southwest Missouri State University, USA

¹⁰⁵ Uttar Pradesh Tourism 2015, Primary and Secondary Surveys 2018

B. Issues of Urban Services and Infrastructure

Overall status of Infrastructure in Fatehpur Sikri shows unavailability of treated drinking water, irregular electricity supply and lack of toilet facilities in the city.

Infrastructure Status - Fatehpur Sikri 90 100 74 80 55 45 60 36 26 40 10 8 20 0 Drinking Electricity Other source Toilets within **Public Toilets** Tapwater No Toilets Open Defication from treated water from of lighting **Premises** source Other Source Source of Lighting Availability of Toilet Facility Source of Drinking Water

Figure 59: Status of Infrastructure in Fatehpur Sikri (in percentage)

Source: Indian Institute of Social Sciences 2017

Water Supply

- The quality of drinking water is very low so many of the residence collect sweet water from "Gurki Mandi" with the help of tankers that travels around 3km away from walled city. This is common for the region.
- As per census 2011, around 74 % of Households have drinking water supply from Nagar Palika Parishad. 26 % of Households uses other sources of drinking water such as well, hand-pump, Tube-well, Borehole, spring, River, Canal, Tank, Pond, and Lake etc.
- As per census 2011, around 74 % of Households have drinking water supply from Nagar Palika Parishad. 26 % of Households uses other sources of drinking water such as well, hand-pump, Tube-well, Borehole, spring, River, Canal, Tank, Pond, and Lake etc.
- As per URDPFI Guidelines 2014, Cities provided with piped water supply with existing/contemplated sewerage system requires maximum 135 lpcd water supply. Based on above guidelines, the required water supply for present and projected population is given below. As per the estimated calculation for 2018, 135 lpcd water supply is required to be provided. The land required for installing 5 MLD Water Treatment Plant is 0.1 hectares, as per the guidelines.

Water Supply Demand - Fatehpur Sikri 8.0 50000 40000 6.0 30000 4.0 20000 Jndo 10000 d 2.0 0.0 0 1991 2001 2011 2018 2028 2038 Fatehpur Sikri Population ••••• Water Suppy - 70 lpd ••••• Water Suppy - 135 lpd

Figure 60: Projected water demand and supply

Source: URDPFI Guidelines and Preliminary analysis.

Sewerage and Drainage

- As per primary survey observation, the open drainage system is present in the city.
 Development encroaching drainage system can create maintenance issues while blockage. The garbage dumping near drainage is blocking the flow.
- As per 2011 census, 55% of households have toilets within premises. 45% of HH do not have toilets within premises out of which 36 % households defecate on open land and only 8 % household uses Public Toilets.

Figure 61: A major sewage line is passing through walled city along railway station





Power Supply

- As per Census 2011, around 90 % of total population has electricity connections. 10% of population depends upon other source like Kerosene, diesel, other oil, etc.
- Though connections are there, but supply is irregular and therefore, dependency on other sources of fuel increases.

• Solid Waste Management

- Within the city there is complete lack of solid waste management. Waste is dumped all over the place.
- o Lakes are dying due to dumping of solid waste near water bodies.

Figure 62: Lakes turning into dumping gound





• Open and Recreational Areas

There is complete gap in the percentage share of recreational activities within the city.
 Only 0.5 % of land is for recreational purpose.

Govardhan

Govardhan is one of the favourite tourist spots for the Hindu religious people. There is a continuous tourist footfall all throughout the year. Therefore, its demand over years has been increasing. Therefore, private realtors building, luxury condominiums and gated residential communities are encroaching upon the farmland around the hill. The existing settlements are expanding into the vans and the groves are being replaced by agricultural fields or housing leading to unplanned urban growth. Unplanned growth and development is coming up all along the parikrama pathway. Unprotected and unmaintained Kunds and heritage areas are present. Solid Waste piles along the hills and the Kunds.

Issues of Urban Development & Planning

Land-use/Master-Plan

- Private realtors building luxury condominiums and gated residential communities are encroaching upon the farmland around the hill¹⁰⁶.
- The existing settlements are expanding into the vans and the groves are being replaced by agricultural fields or housing leading to unplanned urban growth.
- Unplanned growth and development all along the parikrama pathway.
- Core area is very congested, increase of inhabitable settlements in old area, dilapidated condition of houses and lack of necessary facilities¹⁰⁷. Lack of open spaces and narrow lanes.
- o There are about 21 Kunds in the city that is unprotected or are not maintained.

Table 27: 2004 Landuse of Govardhan and Radhakund

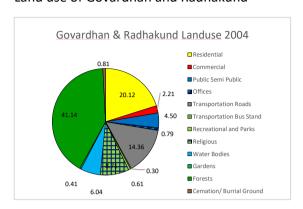
2004 Landuse	Govardhan		Radhakund		Total	
	Area HA	Percentage %	Area HA	Percentage %	Area HA	Percentage %
Residential	42.56	19.11	21	22.56	63.56	20.12
Commercial	6.21	2.79	0.76	0.82	6.97	2.21
Public Semi Public	12.67	5.69	1.54	1.65	14.21	4.50
Offices	2.44	1.10	0.06	0.06	2.5	0.79
Transportation Roads	29.66	13.32	15.68	16.84	45.34	14.36
Transportation Bus Stand	0.96	0.43	0	0.00	0.96	0.30
Recreational and Parks	0	0.00	1.92	2.06	1.92	0.61
Religious	17.98	8.07	9.54	10.25	27.52	8.71
Water Bodies	15.04	6.75	4.03	4.33	19.07	6.04
Gardens	1.28	0.57	0	0.00	1.28	0.41
Forests	91.39	41.03	38.56	41.42	129.95	41.14
Cemation/ Burrial Ground	2.56	1.15	0	0.00	2.56	0.81
Total	222.75	100.00	93.09	100.00	315.84	100.00

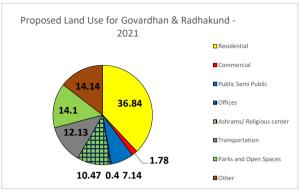
Source: Mathura Vrindavan Master Plan (part G-Govardhan, Radhakund) 2021

 $^{^{106}}$ Sacred Landscapes of Govardhan in Braj: Imagined, enacted and reclaimed by Amita Sinha, Context, Vol VIII Issue I, June 2011

¹⁰⁷ Primary and Secondary Surveys 2018

Figure 63: Existing Landuse of Govardhan and Radhakund as per 2004 Master Plan and 2021 Proposed Land use of Govardhan and Radhakund





Source: Mathura Vrindavan Master Plan (part G-Govardhan, Radhakun

 Proposals for parks and open spaces exists in the Master Plan of 2021. Proposal for parking facility and Camp area for festivals and fair celebrated during festival season.
 Development of Parikrama Marg and Green belt development along it. The ground situation conflicts the provisions given in Master Plan¹⁰⁸.

¹⁰⁸ Proposed Master Plan 2021 and Primary Land Use Survey 2018

Table 28: Proposed 2021 Land Use for Govardhan & Radhakund

Proposed Land Use for Go	ovardhan & Radhakund 2021		
SN	Land Use Category	Area HA	Percentage %
1	Residential		
а	Rural	44.35	
b	Developing Area	75.84	
С	Residential	474.56	
a+b+c	Total Residential	594.76	36.84
2	Commercial		
а	Commercial	26.88	
b	Mandi	1.92	
a+b	Totol Commercial	28.8	1.78
3	Public Semi Public	115.26	7.14
4	Offices	6.53	0.4
5	Ashrams/ Religious center	169.02	10.47
6	Transportation		
а	Bus Stand	5.12	
b	Urban Transportation	1.92	
С	Proposed Roads	117.29	
d	Existing Roads	71.35	
a+b+c+d	Total Transportation	195.68	12.13
7	Parks and Open Spaces		
а	Parks	94.08	
b	Regional Parks	37.76	
С	Green Belts	144.76	
a+b+c	Total Parks & Open Spaces	276.6	14.1
8	Other		
a	Forest	104.38	
b	Tourist Service Centers	9.6	
С	Parking and Campaigns	88.96	
d	Cremation & urrial Grounds	3.52	
е	Water Bodies	21.95	
a+b+c+d+e	Total Other	228.41	14.14
1+2+3+4+5+6+7+8+	Grand Total	1615.05	100

Source: Mathura Vrindavan Master Plan (part G-Govardhan, Radhakund)

For landuse details refer to Map; 2.71 showing existing land use – Govardhan and Radhakund 2018

Industry

- As per Master Plan 2021, there were 45 types of small scale industries in 2002 which includes oil industries, metal manufacturing, furniture, electrical workshops etc. But these are located inside the city core making it congested and suffocating.
- Jaint village in Govardhan is the home of the authentic tulsi mala, where every person is groomed from childhood to pursue the craft. Mahawan is the sweet corner of Braj,

with a small cluster producing the mouthful kheer mohan, inviting brisk sale from pilgrims. The key bottleneck for many of such creative industries is the lack of retail support to market their produce. The temple sites are located at a fair distance from such production sites, and thus the latter lack tourist visits. Not only it is important these suitable quality creative products are made available at the temple assets with necessary branding, but also that tourists are lured to the production sites as a heritage tour, which could add another dimension to Braj more than just a darshan at the temples.¹⁰⁹

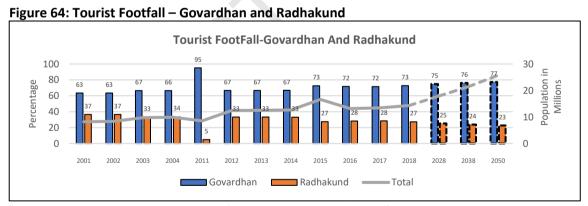
 Projecting the native art forms as an equally integral part of the Braj mythos can be instrumental in the ascension of Braj from a purely religious destination to a centre for arts and culture as well.¹¹⁰

Commerce

 Pilgrimage supporting commercial activities are increasing in the city such as Dharam Shalas, Flower shops etc. But they are scattered all around the city.

Tourism & Heritage

- Unprotected and maintained Kunds and heritage areas.
- Narrow entrances to enter the premise of Kunds.
- Kunds and water bodies getting polluted by sewage entering the kunds
- $\circ\quad$ There are no separation of rain water drain and sewage drain.



Source: Mathura Vrindavan Master Plan (part G-Govardhan, Radhakund), Uttar Pradesh Tourism Department, Preliminary analysis and Projection

 As per projection, the tourist population is estimated to increase by 25 million for which the adequate tourist facilities are required for future development of the city.

¹⁰⁹ Mapping and Assessment of Creative Industries in Agra, Braj Region and Buddhist Circuit, Uttar Pradesh Tourism

¹¹⁰ Mapping and Assessment of Creative Industries in Agra, Braj Region and Buddhist Circuit, Uttar Pradesh Tourism

- As per Master Plan 2021, more than 30 lac population visit Govardhan & Radhakund during Gurupurnima, Adhimas, Ekadashi and Purnima. This influx of huge population causes pressure on the infrastructure currently available in the city¹¹¹.
- The accessibility is very poor from Vrindavan and Mathura. Inadequate transport system, overloading of passengers in buses can cause human lives during festival seasons.

Figure 65: Garbage dumping in Kunds and Damaging of Footpaths and Drainage



Figure 66: Many houses have historic characteristics which are in dilapidated conditions



¹¹¹ Mapping of Heritage Assets and Tourist Attractions, BRAJ CORRIDOR, Uttar Pradesh Pro-Poor Tourism Development Project, Volume I&II, World Bank

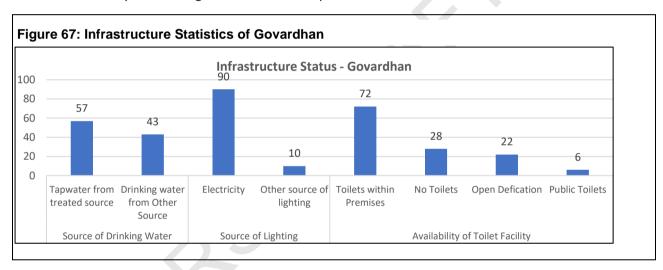
A. Issues of Urban Settlements Forms and Space

Housing and conforming/Non-conforming activities

- Congested housing development
- Dilapidated houses in old area
- o Growing slums and unhygienic settlements
- Open drains and narrow lanes
- o In 2051, Govardhan will require around 6400 dwelling units to accommodate its population.

B. Issues of Urban Services and Infrastructure

The existing infrastructure to support the growing tourists and their needs apart from the residents of the city of such large numbers is inadequate.



Water Supply

 As per census 2011, 57 % of Households have drinking water supply from Nagar Panchayat. 43 % of Households uses other sources water drinking water such as well, hand-pump, tube-well, borehole, spring, river, canal, tank, pond, lake, etc.

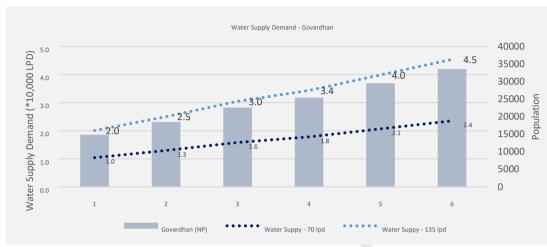


Figure 68: Water Supply Demand of Govardhan

Source: Mathura Vrindavan Master Plan (part G-Govardhan, Radhakund), URDPFI Guidelines, Preliminary analysis and Projection

- As per URDPFI Guidelines 2014, cities provided with piped water supply with existing/contemplated sewerage system requires maximum 135 lpcd water supply. Based on above guidelines, and the estimated calculation for 2018, 5 MLD Water Treatment Plant (WTP) is required for 135 lpcd of water supply. The land required for installing 5 MLD Water Treatment Plant is 0.1 Hactares, as per the guidelines.
- As per Master Plan 2021, the current water supply is 50 lpcd which is very low as per the guidelines. The minimum water supply should be 70 lpcd. There will be shortage of 5.39 MLD in 2018 considering the trend of water supply.

Sewerage and Drainage

- As per 2011 census, 55% of Households have toilets within premises. 45% of Households do not have toilets within premises out of which 36 % Households defecate on open land and only 8 % household uses Public Toilets.
- Sewage generated is 3.16 MLD and 4.17 MLD in 2018 & 2038 respectively¹¹².

¹¹² Preliminary analysis and URDPFI Guidelines 2014

Table 29: Sewerage Statistics of Govardhan and Radhakund

Sewerage - Govardhan & Radha Kund					
Year	Population	Sewage generated @80% of supply (MLD)			
1991	19510	2.42			
2001	24426	3.03			
2011	22576	3.74			
2018	25433	4.23			
2028	29515	4.88			
2038	33597	5.55			
2050	51211	6.36			

Source: Mathura Vrindavan Master Plan (part G-Govardhan, Radhakund), URDPFI Guidelines, Preliminary analysis and Projection

Power Supply

 As per Census 2011, around 90 % of total population has electricity supply. 10% of population depends upon other source like Kerosene, Solar energy, other oil, etc.

Table 30: Power Supply Statistics of Govardhan and Radhakund

Electricity - Govardhan & Radhakund						
Year	Year Population No of Substations required					
1991	19510	1.30				
2001	24426	1.63				
2011	22576	1.51				
2018	25433	1.70				
2028	29515	1.97				
2038	33597	2.24				
2050	51211	3.41				

Source: Mathura Vrindavan Master Plan (part G-Govardhan, Radhakund), URDPFI Guidelines, Preliminary analysis and Projection

• Solid Waste Management

- Solid Waste piles along the hills and the Kunds.
- Waste generated in Govardhan is 30.52 MT per day for 2018 excluding the floating population. It will double by 2050.

Table 31: Solid Waste Management - Govardhan & Radhakund

Year	Population	Solid Waste N Waste Generation from Residential refuse @0.6kg/capita/day (in MT's)	Management - Go Waste generated from Commercial refuse @0.2 kg/capita/day in (MT's)	vardhan & Radhakund Waste generated form Street Sweeping @0.2kg/capita/day (in MT's)	Waste generated from Institutional refuse @0.2 kg/capita/day in (MT's)	Waste generation per Day (in MT's)
1991	19510	11.71	3.90	3.90	3.90	23.41
2001	24426	14.66	4.89	4.89	4.89	29.31
2011	22576	13.55	4.52	4.52	4.52	27.09
2018	25433	15.26	5.09	5.09	5.09	30.52
2028	29515	17.71	5.90	5.90	5.90	35.42
2038	33597	20.16	6.72	6.72	6.72	40.32
2050	51211	30.73	10.24	10.24	10.24	61.45

Source: Mathura Vrindavan Master Plan (part G-Govardhan, Radhakund), URDPFI Guidelines, Preliminary analysis and Projection

• Open and Recreational Areas

As per Master Plan 2021, there were no existing parks and recreational facility in 2004 in Govardhan and only 1.92 Ha land was existing under Parks & recreational use in Radhakund. In 2021, there is a proposal of 380.98 ha of land under parks and recreational use which 12.13 % of total area. In Master Plan there are proposals for developing entertainment area and recreational areas near water bodies to preserve it. The hill area and buffer belt along Parikrama Marg is proposed for Recreational & Open Space in 2021 Master Plan document.

Figure 69: Illegal Constructions at Parikrama Marg



Parikrama Marg has been developed without vegetation and illegal construction was observed along it¹¹³.

3.2.3 Issues in the City Level - Agra

Agra Master Plan for 2021 anticipates an area of 20,000 hectares which have been assigned landuses as per future development projections. The existing scenario of development in the city indicates some variation to the proposed Master Plan though progress has been observed in the primary focus areas of the Master Plan which includes enhancement of tourism and restricting the industrial sector.

Issues of Urban Development & Planning

Land-use

A comparative analysis between the existing (2018) landuse of the urban agglomeration and proposed landuse for 2021 as per the Agra Master Plan has indicated that:

- A major increase (about 15%) in area has been observed in residential category. Much
 of land which was meant to be used for recreational purpose has been encroached and
 put to residential use.
- The area under industrial use is lesser (by 3.1%) than it had been proposed. The drop in number is probably due to the closure of 292 coal based industries after the initiation of the TTZ project.
- The area under recreational and open spaces is much lesser than required for a city of Agra's size. According to UDPFI guidelines, the proportion of recreational areas which includes green and open spaces to the developed area should be 20-25%.
- Re-development and renewal has taken place all along the roads leading to Tajganj area in a span of 6 years but the alleys and bays leading to the inner part of the city have not been developed leaving an incomplete network.
- The city displays an unplanned and unregulated growth in all directions with almost 50% slums.

¹¹³ Mathura Vrindavan Master Plan (part G-Govardhan, Radhakund) 2021

Table 32: Proposed 2021 Landuse and Existing 2018 Landuse for the Agra Urban Agglomeration

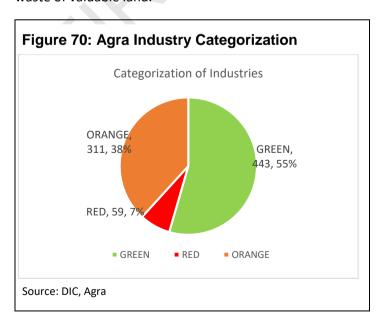
LANDUSE	Proposed Landuse (2021)	Percentage	Existing Landuse (2018)	Percentage	URDPFI Guidelines
	in Ha	%	in Ha	%	%
Residential	9923.8	49.5	10810.7	64.8	36-38
Residential-Urban			9346.5		
Residential-Cottage Industry			1464.2		
Commercial	544.2	2.7	1001.4	6.0	6
Mixed Use			504.0	3.0	
Industrial	1606.3	8.0	816.5	4.9	7
Public and Semi Public	2271.8	11.3	1300.0	7.8	11
Tourism	178.2	0.9	400.0	2.4	8
Traffic and Transportation	2161.6	10.8	1500.0	9.0	13
Recreation and Open Spaces	875.4	4.4	361.6	2.2	15
TOTAL DEVELOPED AREA			16694.2		
Other Open Spaces	421.6	2.1	4655.9		Balance
Water Bodies/Wetlands			327.9		
Vegetation/Forest Land			903.2		
Reserved Forest			3424.7		
Other	2054.1	10.3	115982.3		Balance
Other			0.0		
Waste Land			757.8		
Agricultural			112475.8		
Residential-Other			2260.4		
Vacant Land under Development			1999.9		
Vacant Land within Developed Area			748.8		
Total	20037.0		136828.4		

- There are many unregulated slums and squatter developments with no infrastructure provision and poor economic conditions.
- Unregulated and unplanned growth all along the river is also an issue as the geomorphology shows that there is severe erosion and occurrence of wastelands along the river.

- There are many unregulated favelas with no infrastructure provision and poor economic conditions.
- o Existence of squatters is also prevalent in many parts of the city.
- Unregulated and unplanned growth all along the river is also an issue as the geomorphology shows that there is extreme erosion and occurrence of wastelands coming up all along the river.

Industry

- Industries have played a major role in the development of Agra. The city was an industrial hub until the declaration of the Taj Trapezium Zone in 1997-1998, and the implementation of strict pollution norms, shut down 84 of the 250 foundry units operating then. Today, there are 128 active foundry units in the city which are functioning according to environment friendly standards. The crackdown also shut down 450 brick kilns, within the 20 km radius of Taj Mahal. Tanneries, leather factories, sweet factories were also among the many industries that faced the lock down due to environmental concerns.
- Though, most of the big foundries relocated to Etah, Firozabad and Hathras, foundry association members claim that over 300,000 people were directly and indirectly affected by shut down, particularly the smaller units. The 66th round of National Sample Survey Office, show that Agra was one of the top three cities that saw maximum increase in unemployment rate in the 2000s. The rate increased from 0.2 per cent in 2004-05 to 5.5 per cent in 2009-10. A critical concern when relocating industries would be to ensure alternative means of livelihood and a well-planned transition to environment friendly technology and manufacturing practices.
- The industrial estates particularly, the Nunhai Industrial Estate are not well planned and are located next to residential zones.
- Sikandra Industrial area has sick and closed tanneries which is either used as unauthorised warehouses or illegal squatters or simply abandoned, which is a waste of valuable land.



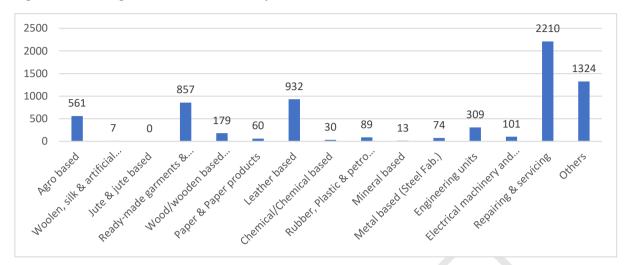


Figure 71: Existing Micro And Small Enterprises

- o There are many unregistered/illegal industries that are still running within the city.
- There are many sick industries in the core as well, again a waste of valuable land which could be put to productive use particularly in a core that is overcrowded.
- One of the major home based industries is the Petha and snacks industry of Agra. Petha is Agra's second identity after the Taj Mahal. There are almost 1500 Petha units in the city with a daily estimated capacity of 700-800 tonnes of petha production. Unfortunately, Petha is also a prominent threat to the environment of the Agra city. The main source of air pollution from this industry is the use of about 225 tonnes of coal or firewood every day. "According to a December 2013 report by ADA, titled The Comprehensive Environmental Management Plan for Taj Trapezium Zone Area, the average wood consumption in each petha unit is five kg per day, whereas coal used is about four kg per hour. Thus, the total daily consumption of all the petha units is estimated to be 500 kg wood and 4.7 tonnes of coal, which emit nearly 7.5 tonnes of CO2 a day. This is equivalent to the CO2 emission by three diesel-run SUVs in a month" This leads to generation of various gases which coupled with morning fog causes smog-like conditions. The solid leftover wastes such as fly ash and particulate matter are added pollutants.

¹¹⁴ Source: https://www.downtoearth.org.in/coverage/daunting-journey-49613

Figure 72: Waste from petha industry causes clogging



Although tourism contributes to a large extent in the economy of Agra, the city has a substantial industrial base. A lot of manufacturing plants and industry related to wholesale markets is prominent in Agra. The economy of Agra is dependent on industrial production and produces automobiles, leather goods, handicrafts and stone carving works. Agra has a good number of apparel and garment manufacturers and exporters. Agra has also developed a thriving export business. The leather industry is among the most traditional and original industries of Agra. However, as per the census data, there has been a decline in the secondary sector due to shifting of industries.

Table 33: Occupational Structure of Agra

Occupational Structure	2011		2001		1971	
	Numbers	Percentage	Numbers	Percentage	Numbers	Percentage
Primary	15567	3.07	11961	3.78	4410	2.87
Secondary	79453	15.66	52252	16.5	13325	8.69
Tertiary	412345	81.27	252437	79.72	135660	88.44
Total	507365		316650		153395	

Source: Census 1971, 2001, 2011

Commerce

- Tourism and handicrafts makes trade and commerce a very important part of Agra's economy. There are more than 50000 shops & commercial establishments registered at Nagar Nigam. The average growth rates of commercial establishments are high compared to hotels & restaurants. The area under commercial use is at par with the standard guidelines. However, mixed used activities have emerged in the inner city with shops on the ground floor and residence on upper floors.
- Cottage industries and home based industries are common in the households of the core and precinct. The inner city area has narrow and unhygienic streets, which are being encroached by various handicrafts and small –scale activities like leather work and petha production.

- The petha manufacturing industries are small, shabby and located in unhygienic conditions within the inner part of the city.
- The major commercial establishments are souvenir, handicraft, snacks and sweet shops. However, as tourism is a major source of economy in Agra, the restaurants and hotels play a prominent role and can be enhanced to strengthen the economic base.



Figure 73: Commercial Establishments in Agra

Source: CDP 2006

Tourism

- Agra's importance on tourist map cannot be underestimated; it is one of the key tourist
 destinations attracting tourists from all over the world.
- The city forms one edge of the prime tourist circuit in India- the so-called Golden Triangle, the other two cities being Delhi and Jaipur. But there is no proper documentation of the heritage buildings.
- Lack of tourist infrastructure is a burning issue in this global tourist destination. The tourism potential of the city needs to be utilized well.
- Heritage sites like Itmad-ud-Daula, Mehtab Bagh, Chini Ka Roza, and Sikandra have not been brought to prominence and have not been well connected with the Taj Mahal and Agra fort tourist circuits. Integrated tourism strategies may distribute the tourist footfalls all across the city instead of just two UNESCO sites.
- Some of the heritage buildings are in a dilapidated condition.
- Areas east and west of Taj Mahal along the river are totally neglected and needs intervention.
- Areas around Mehtab Bagh is growing in a haphazard manner with new favelas thriving in the area.
- In order to attract tourists, pro tourist projects have been proposed and implemented like the international Golf course, stadiums, heritage walks but not much has been done towards the development of sustainable tourism in the core and the precinct area.
- The tourist inflow for coming years has been predicted for the city of Agra based on previous years' tourist footfall.

Figure 74: Agra Hotel Statistics



Source: UP Tourism

Table 34: Projected Tourist footfall in Agra (2013 - 2038)

YEAR	INDIAN	FOREIGN	TOTAL	GROWTH%
2013	7728513	1230708	8959221	
2014	8092980	1172745	9265725	3.4%
2015	7114460	1138486	8252946	-10.9%
2016	6515331	1205506	7720837	-6.4%
2017	8354418	1543088	9897506	28.2%
2018	8510894	1621183	10132077	2.4%
2028	10075657	2402133	12477790	23.2%
2038	11640419	3183083	14823502	18.8%

Figure 75: Tourist Projection for Agra



 As per the study by Ministry of Tourism, Agra's availability of 50-rooms/lakh tourist is substantially lower than the national average of 423 rooms/lakh tourist. However, this could be contributed to the fact that a larger number of visitors to Agra are day tourists and usually seek accommodation in Delhi.

Table 35: Projected Number of Beds Required by Tourists In 2038

PROJECTED TOURIST INFLOW 2038	TOURIST PER DAY	NO. OF BEDS REQUIRED AT A TIME (AVG STAY = 2 DAYS)
14823502	40612	81225

Table 36: Hotel Projections for 2038

		PRO	JECTIONS FOR	YEAR 2038				
Type Of Accommodation	Percentage Share of Type Of	No. Of Beds (2017)	Percentage Share Of	No. Of Beds	No. Of Rooms	No. Of Rooms	No. Of	No. Of
	Accommodation		Beds	Required 2038	2017	Required 2038	Units 2017	Units 2038
LUXURY HOTELS	5%	3343	30%	24229	1672	12118	13	94
BUDGET HOTELS	87%	7710	69%	55880	3876	28092	214	1551
PAYING GUEST	8%	154	1%	1116	77	558	19	138
TOTAL	100%	11207	100%	81225	5625	40768	246	1783

The tourism policies by the Government suggest a significant growth in tourist footfalls in the next 20 years which will require more accommodations and hence, more hotels, restaurants and tourist infrastructure and amenities by 2038.

Issues of Urban Settlements, Forms and Space

Housing

- The traditional old city of Agra has undergone transformations over time while retaining its original character. Areas closer to the old city exhibit dense development since much of the economy through tourist activities is concentrated around the core.
- The core of the city experiences intense development pressure due to its proximity to the prominent tourist attractions, services and jobs.
- The peripheral areas are gradually attracting attention due to better planned infrastructure and facilities.
- The housing shortage has been predicted based on the present scenario.

Table 37: 2038 Housing Projection for Agra

Year	2011	2018	2038
Population	1585704	1803103	2424243
Households	267945	300517	404041
HH Size	6	6	6
Housing Shortage	14595	18456	38360

Source: Census 2011, RAY

- The total number of people living in slums is close to 9.17 lakh which constitutes to around 54% of the city's population of which 51% are notified slums while the remaining 49 are non-notified. The slums are distributed all across the city with the highest density occupying the area along the river in the Trans Yamuna zone.
- 50% houses in slums are pucca with brick wall, PCC flooring whereas some people live in ihopris.
- More than 18% of the population does not have any water facility. Water supply system
 is not adequate nor is the quality of water that is supplied. Even the ground water in Agra
 is high on fluoride and not potable.
- Poor sanitary conditions due to clogged drains, collection of household wastewater in open pits is prevalent in these slums. Slums also lack adequate toilet facilities, which leads to open defecation.
- Some slums have come up along the drains, which have increased the vulnerability of the residents living there.





- Non-Conforming Activities
- Re-development and renewal has taken place all along the roads leading to Tajganj area in a span of 6 years but the alleys and bays leading to the inner part of the city has not been developed in this process.
- The city displays an unplanned and unregulated growth in all directions with a huge number of slums coming up in the region. There are many unregulated favelas with no infrastructure provision and poor economic conditions. Existence of squatters is also prevalent in many parts of the city.

• River Front Development

• Proposals for constructing a barrage downstream near Nagla Paima, aimed at stabilising the rivers levels and river front development has received approval from the state and the irrigation department but, it is a decision one must consider, looking at future than the present. Dams and barrages are known to have killed rivers. The developed nations are removing dams to revive rivers into healthy naturally flowing rivers with a naturally thriving ecosystem. A dam or barrage will destroy the natural ecosystem of the river, increase sedimentation and bank erosion. Development and construction will cause

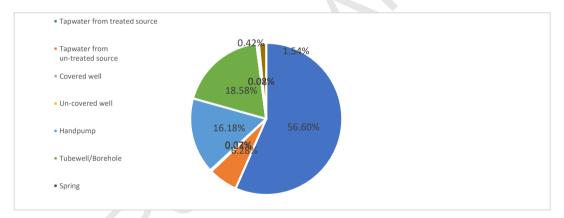
negative impact on a river that is already dying due to man-made causes which includes barrages in the north. If the river must be rejuvenated, it must be allowed to in its natural pace through ravine development, Wetlands, rain & flood water harvesting along with afforestation. In the end, Taj Mahal really is a metaphor for a battle for a clean environment and sustainable development for a healthy lifestyle.

B. Issues of Urban Services and Infrastructure

Water Supply

- o The area covered by piped water network is only 85 per cent. Hand pumps and tankers meet the water requirement in Sikandra-II, Bodla-II, Shahganj-III, Tajganj-II & III, Trans Yamuna-II & Ghatwasan-II areas.
- o In order to reduce the water losses during distribution network needs to be improved and worn out/rusted pipes needs to be replaced.

Figure 77: Source of Water in Agra



- The percentage of water loss due to leaks from pipes and pipes appurtenances ranges between 9-37 per cent while UFW ranges between 40-45 per cent of the total supply, which is very high.
- Poor raw water quality. Excessive water loss due to leaks in water pipes and pipe appurtenances.
- Damaged water mains and distribution mains. Very low pressure at tail end.
- Catchment area of the Zonal Pumping stations is not clearly segregated. The length of the pipe network is about 1350km, 95 per cent of the leakages is due to service lines.
- Out of 15 blocks in Agra, 11 are in critical condition. Due to illegal boring for tubewells, installation of submersible pumps in households, deforestation, lack of rain water harvesting measures and concretization of parks and green zones of the city, the ground water table is fast depleting¹¹⁵.

https://timesofindia.indiatimes.com/city/agra/Agra-division-ground-water-level-depleting-fast/articleshow/46148548.cms

- o In Sikandra-II, Bodla-II, Shahganj-III, Tajganj-II & III, Trans Yamuna-II & Ghatwasan-II the water requirement is met by Hand pumps and tankers.
- The UFW ranges between 40-45 per cent of the total supply, which is very high.

Sewerage and Drainage

- According to 2013 NEERI report only 17 per cent (1,400 ha out of 8,360 ha) of the city is covered by sewerage network and 254 MLD wastewater flows through the city drains against the treatment capacity of 90.25 MLD which indicates that only 10 per cent of the sewage gets treated. However, Agra authorities, have mentioned post 2013, sewerage network has increased to 30 per cent and more work is in progress under smart cities program particularly in the precinct and core.
- About 50 per cent of the sewerage system is not in working condition. Most of the sewage goes into the open drains, floods into the adjacent areas and finally gets dumped into the Yamuna.
- The system is badly silted, choked and damaged at number of places and overloaded due to the over exploitation of limited infrastructure.

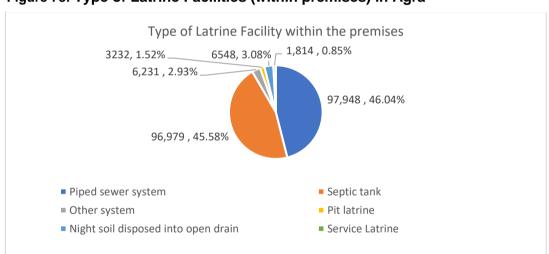
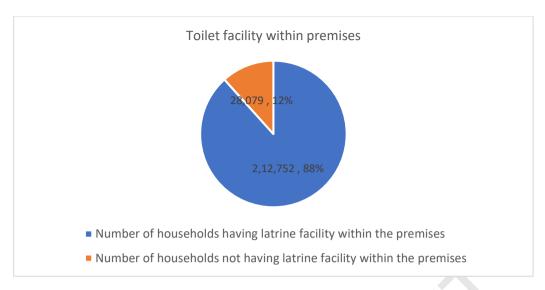


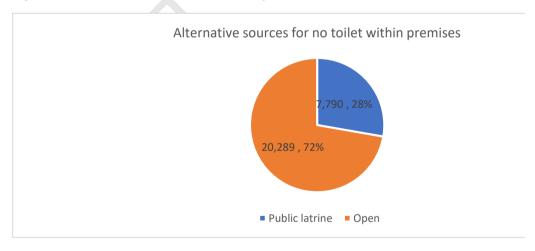
Figure 78: Type of Latrine Facilities (within premises) in Agra

Figure 79: Type of Toilet Facility (within premises) in Agra



The STPs are made to perform beyond capacity, but still treat only 10% of the sewage they receive. Improper means of disposal of wastewater has also resulted in environmental pollution and creates unhygienic conditions. Treatment capacities being inadequate, results in discharge of untreated sewage into water bodies, particularly river Yamuna and other nallahs. The STPs at Dhandupura treats city sewer and discharge of 17 nallahs whereas STPs at Pila Khar and Magla Budi treats only discharge coming from nallah water.

Figure 80: Alternative To No Toilet Facility Within Premises



 Taj East Drain is one of the most polluted and malodorous drains in the city, discouraging tourism and impacting the health of people living along the drain. Large quantities of solid waste are generated and dumped into the drain obstructing the natural flow of wastewater and hence it's organic and spontaneous renewal capacity. 116

¹¹⁶ Source: Taj East Drain DPR

Figure 82: Storm water drain clogged with rain



Figure 81: Drain near Taj Fort



Power Supply

• In Agra, electricity supply is given by Torrent Limited. The city hardly faces any issue related to power supply. The issues existed when the industries needed power for machinery but recently, the work has been undertaken by GAIL which makes electricity surplus for the city. However, solar energy is not being harnessed. Hence, dependency on renewable sources exists.

Main source of lighting No lighting 1,055 Any other 1,114 Other oil 295 Solar energy 705 Kerosene **6,959** Electricity 50,000 1,00,000 1,50,000 2,00,000 2,50,000

Figure 83: Main Source of Power in Agra

Solid Waste Management

- In Agra all the waste is added to the Nagar Nigam waste without segregation. Nagar Nigam does not have a proper disposal site for dumping of solid waste.
- The arrangement for separate collection of infectious biomedical waste is non-existent and there are no separate arrangements for transportation of infectious waste from hospitals and nursing homes.
- Several temporary storage points are not cleared on a day-to-day basis. This backlog of unserved bins continues to build up during rest of the week. Community involvement is absent.

Figure 84: Leather waste burnt after dumping to nalla and trash dumped along drains



Open and Recreational Areas

- The Supreme Court in April 1994 directed MoEF to take implementation of the Green Belt and UPSPCB to issue notices and obtain necessary information for shifting of industries from Agra to areas outside the TTZ. The parks, in consideration, are either being maintained well by societies responsible for particular parks, or are being proposed to have construction of necessary urban design and landscaping features, which would render it fully functional as a public park.
- Necessary facilities and their operation and maintenance are proposed and/or considered by bodies. The area under recreational use is only 3% which is much lesser than the standards.

3.2.4 Issues in the City Level - Agra

Issues of Urban Development and Planning

Zoning for Heritage Conservation, Congestion Mitigation and Environmental Protection

- Lack of adequate zoning has resulted in land encroachment by slums and squatter developments thus resulting in view shed and accessibility obstruction for heritage monuments.
- Open and unused areas are encroached by squatters or treated as defecation grounds. The need is to assign specific landuses to every part of the land available in the city as is done in Singapore and to ensure that the land use assigned is put to use. No part of the land or buildings should be left vacant or unused. Any part that is not being used currently or is proposed as a landuse for future, should be temporarily zoned as recreational and converted into parks and gardens till the actual proposed landuse is implemented.
- Slum development and squatter development has also resulted in obstruction in the Heritage and river connection.
- Standards to be laid to ensure visual integrity of heritage sites is maintained.
- o "Entire public landscape is fragmented, with no means of getting from one park to another, and no deliberate connection with the river. Shahjahan Park lies deserted,

fenced from the teeming street life of the city and neither opens onto the river, as does the cremation site and temple ghats next to the Taj. The historic monuments have thus become islands, representing vestiges of history cut off from the urban life around them"¹¹⁷.

- Many small heritage sites are lost among the slums due to codes that allow for protection of heritage sites of national and global importance only.
- Step wells in the precinct have become garbage dumps and need protection through reforms in heritage codes or heritage zoning.
- Festive season and holidays result in greater congestion and pollution in the core. Special seasonal zoning ordinances may be developed to address the overflow of tourist in the precinct during holiday season. E.g. Street vending zones can follow regulations seasonal zoning. A zone may be marked vendor free during the peak tourist season and may resume street vending in off season.
- Animals on the road not only increase congestion but also cause dirt and filth on the roads. Area should be zoned for restricting random animal movement in public spaces.
- Most settlements within the precinct are unplanned, haphazard growths without any sense of regulation. They do not have adequate infrastructure and have a slum like structure. Building permits should become more stringent. Building permit should not be issued for multi-story buildings or dense settlements if they cannot produce evidence of compost units and adequate infrastructure particularly, roads, light, water supply, sewage and sanitation systems.
- Currently there are dhobi ghats, crematoriums, bathing ghats, defecation grounds along the river which play a vital role in its degeneration within the precinct area. Zoning ordinances need to be established to regulate restricted access to the river or allowing public access only at certain points, to prohibit conventional crematoriums, idol immersions, and other non-confirming activities along river banks.
- Many of the river fronts are encroached by squatters though these areas are assigned as green spaces and proposed as park and gardens in the 2021 master plan. Since the river is fast dying it is essential to be very careful about the choice of development on the river front. It should be ensured that flood protected zones should be free of any building construction. All reclaimed land should be returned back to the river and river rehabilitation strategies should be implemented.
- Accessibility and viewshed protection of heritage sites have not received adequate attention.¹¹⁸

• Industry

- Closure of industries also have adverse effect on the income of the households that relied on those industries, resulting in lower quality of life and increase in poverty and slum growth.
- The major part of the industrial activity in the wider precinct zone is in the form of small-scale and house-holds industries that comprises of textile, leather, foundries, diesel engines, generator sets, electrical goods, fans, pipes, C.I, casting, leather goods including

¹¹⁷ Source: Taj-Heritage-Corridor-on-the-Yamuna-Riverfront

¹¹⁸ Taj Heritage Corridor: Intersections between History and Culture on the Yamuna Riverfront [Places / Projects] Journal Issue: Places, 16(2), Authors: Harkness, Terence and Sinha, Amita

shoes, steel rolling, packaging materials and cottage industries -petha. These industries are mainly located in the old Mughal city particularly Rakabganj, Kotwali, Tajganj that are core areas of the wider precinct zone. Almost 90% of these household industries work in unhygienic conditions without proper ventilation in the work areas and inadequate waste disposal.

Figure 85: Unhygienic Petha Units





- The need is to bring in alternatives and strategies to make a balance between environment, heritage and development.
- Petha industry: Around 1500 petha units were active in the Noori Darwaza locality when the supreme court ordered the industries within a 80 km radius around the Taj Mahal, to either switch to gas based technology or move their units. An alternative unit at Kalindi Vihar was offered as an alternative location 155 plots and an lpg center but majority of the petha unit owners refused to relocate claiming infrastructural deficiencies and non-availability of sweet water essential for petha in the newly built petha enclave. The need is either to upgrade the working conditions of the petha units at Noori Darwaza or address the infrastructural deficiencies at Kalindi Vihar. The current status of the petha units at Noori Darwaza is extremely unhygienic for a food industry. Almost 90% of these petha units work without proper lighting and ventilation and inadequate waste disposal system.
- Foundries: The precinct zone shares its boundary with foundry nagar and the nunhai industrial estate. Most of the non-conforming units have relocated or shut down. Industries have relocated to the leather park or sikandra industrial park outside the Municipal boundary of the city. However, many of the sick and closed industries are left abandoned and used as illegal warehouses or squatters. This is a waste of valuable land along the river and the heritage precinct, which can be developed into riverfront parks and tourist hubs. The need is to revive these abandoned industries either with alternative environmentally friendly industry or other alternate use.
- Shoe, Inlay work and other home based industries: Shoe industry has been a prominent industry of Agra and shoe clusters provides employment to 40% of the population in Agra in a direct or indirect way. After the close of the tanneries in Agra, leather is imported

from other Indian Cities or abroad. ¹¹⁹ The main products from Agra footwear cluster include the following: Soles, Lasts , Rubber and plastic sheets, Heels, Top lifts, Laces, Thread, Belt and Assorted raw material. Home based cluster units are the in Chippitola, Mantola Kazi pada with stores in Hing in Mandi, Jagdispura and Lohamandi. The majority of this units are homebased, unregistered and without a proper support of any organization. The need is to create a cooperative or society, that can help these units to work in a more efficient manner, with environmentally friendly means and enhance the economy base through an industry that was a part of the culture and heritage of Agra and had been a tradition since the Mughal period.

Table 38: Footwear Industry Statistics

Product	Number of units	Production (tonne/year)
Plastic sole	150	37,200
Shoe last	12	3,402
Leather sole	3	12,85,200
Plastic heel	20	48,00,000
Shoe sheet	20	4,740
Total	205	61,30,542

Source: Footwear Clusters of Agra Study

- Similarly, there are home based units in Tajganj which profess in marble inlay work or parchi kari and zardozi work. These home based unit clusters again operate in adverse unhygienic conditions of slums. The need would be to create a cottage industry park for the home based industries to give a better quality work environment and also provide better income facilities to the slum dwellers.
- There are few abattoirs in Agra that needs to function properly with good infrastructure.

Tourism

Tourism is one of the major sources of employment in Agra and one of the major industries of the city. Everyday lakhs of visitors' flock to the city for its heritage sites particularly in the months of November — February. The majority of these transient populations who come for a day visit or a one-night stay, concentrate around the core and precinct area since the majority of the prominent heritage sites are there and so are all the luxury hotels and majority of the budget hotels. This invites tourist related commercial activities as well to the core and precinct area. As has already been noted, major slums are in the core, a big chunk of the industrial activity is close to the core, home based cottage units are in the precinct and the core, major tourist related activities are in the core. All these factors are putting excessive pressure on the cores infrastructure and transportation system, as well as degrading the air and water quality.

¹¹⁹ Footwear Cluster of Agra Study

The need therefore, is to ensure adequate infrastructure to meet the growing needs of the core and precinct. It is also essential to develop strategies to release some pressure off the core by distributing the activities and population settlements that are concentrated in the core.

TOTAL TOURIST FOOTFALL IN AGRA

12000000

10000000

8000000

4000000

2000000

0

2013

2014

2015

2016

2017

Figure 86: Total Tourist Footfall in Agra

Source: UP Tourism

Issues of Urban Settlements Forms and Space

Housing

- There is a huge housing shortage in the precinct area particularly the slums. About 56% population of Agra lives in Slums. About a 3rd of them are in the Precinct area. More than 3% of Agra slum dwellers reside in Tajganj only. Majority of the slums in the precinct area are more than 20 years old with outdated infrastructure. The lack of housing and basic services at the required pace to meet the challenges of urbanization has resulted in the development of slums and squatter settlements with wider ramifications on the health, safety and wellbeing of the citizens. Even though 94% of the total houses are Pucca in nature, most of them are found to be in dilapidated condition.
- All slums in the precinct zone save one are on secured, tenable, state government owned land. About 7 sections of these slums are in insecure land. All slums are prone to flooding. Katra Wazir Khan the largest slum with 0.79% of the total population, is in the trans Yamuna region.
- There are two types of slums in the precinct region. Those with tenure and on government land and those which are squatters on public and private land. Both types of slums are growing beyond the carrying capacity of the available infrastructure. While it is easier to relocate the squatters, it is difficult to relocate the tenured slums who have lived in the region from generations and have become a part of the city's character.



Figure 87: Community Attribute Tradeoffs That Will Give Incentive To Slum Dwellers To Relocate

Source: Tanvi Agarwal Thesis (details to be added)

River

- River degeneration: most gardens were abandoned as bridges built brutally cutting the visual connection between Agra Fort and the gardens in the north. Over the years, households, factories and farmlands has transformed the river into a sewage dump site and the backyard of the city. The river gradually becomes the confluence of untreated sewage canals instead of a connection historical monuments and civic life. 120
- The pollution of Yamuna River is not the problem of Agra by itself. The river, a connection of historic Indian cultures, is managed separately in 6 segments divided by 5 major barrages. As each barrage holds up water and force downstream area to accumulate pollutant, the river now relies on monsoon water discharge by upstream barrages to dilute some pollution from July to September. The river has literally become a dead zone with no capacity of self-cleaning. Another barrage may kill its potential to revive its natural flow and eco system.¹²¹
- Major impact on the environment with respect to water and air quality particularly the primary river in the region, Yamuna is not a citywide impact but a region wide impact which extends beyond the Taj Trapezium Zone. Eg. The YAP 1 documented that Yamuna begins its degeneration process way up north. A small stretch of 22kms in the capital Region, Delhi, the river turns into a sewer. To address the precinct level issues of a dying river, which forms a main element of the heritage conservation vision plan for Taj Heritage conservation.
- Over the years, households, factories and farmlands has transformed the river into a sewage dump site and the backyard of the city. The river gradually became the confluence of untreated sewage canals instead of a connection historical monuments and civic life.

The reclaimed land that was originally proposed for taj corridor in 2002-2003 is now a
piece of useless land partially piled with garbage from an influent sewage canal further
threatening the fragile hydrological environment of Yamuna River.¹²²

Issues of Urban Services and Infrastructure

• Infrastructure balance and prioritization

- Tourist potential invite poor migrants to the city, most of who settle down in the already dense slums in the hopes of better employment opportunities but eventually press the cities infrastructure particularly the core beyond its capacity.
- A significant percent of 43% of the households do not have access to drinking water and are dependent on public water taps, tube wells, open wells, hand pump and water tanker. In a slum it is observed that on an average about 5 households are sharing one public tap.
- Sewage connections are devoid of proper house connection. Most of the sewage goes into the open drains. The STP at Dhandupur in the precinct zone is underutilized. The area covered by the sewerage system is only 17 per cent. About 50 per cent of the sewerage system is not in working condition. The STPs are made to perform beyond capacity, but still treat only 10% of the sewage they receive. Treatment capacities being inadequate, results in discharge of untreated sewage into water bodies, particularly river Yamuna and other nallahs. The STPs at Dhandupura treats city sewer and discharge of 17 nallahs whereas STPs at Pila Khar and Magla Budi treats only discharge coming from nallah water. 123
- 98% of the slums have street lighting facilities, not all of which are in working condition and found to be insufficient.
- O About 56% population of Agra lives in Slums. About a 3rd of them are in the Precinct area. More than 3% of Agra slum dwellers reside in Tajganj only. Majority of the slums in the precinct area are more than 20 years old with outdated infrastructure. The lack of housing and basic services at the required pace to meet the challenges of urbanization has resulted in the development of slums and squatter settlements with wider ramifications on the health, safety and wellbeing of the citizens. Even though 94% of the total houses are Pucca in nature, most of them are found to be in dilapidated condition.
- All slums are prone to flooding. Around 144 slums to be flood prone with rainwater remnant for 15-30 days. Moreover, the duration of water logging is found to be more than a month in 2 slums, indicating lack of safety to the slum dwellers.¹²⁴
- Most studies have indicated many of the local industries in the precinct area particularly the shoe industry have adverse effect on the sewerage system due to inadequate waste disposal management and sewerage treatment. The by-products of the industries and the waste produced are disposed of into the open drains which are inadequate in capacity and construction. Eventually the wastes get disposed of to the Yamuna or flood

¹²² ^{73, 74,} Rethinking Taj Heritage Corridor: A River as Historic Connection

¹²³ Slum free city plan of action, agra, Regional Centre for Urban and Environmental Sudies, 2009-2013

¹²⁴ RAY survey

- into the adjoining slums causing health and sanitation issues and environmental degradation.
- 42% of slum dwellers practice open defecation along the river, open drains or railway lines
- Though 79% of the slums have some kind of sewerage facilities, they are inadequate and inefficient. Grey water and waste water from houses are directly dumped into the open nallah or nearby open drains along with solid waste, makes it overloaded and choked.
- o Power supply is inadequate in the city and core.
- o SWM is inadequate in the city and the core.

Annexure of Chapter 4

Annexure 4.1: Estimation of emissions from vehicular sources

	S.No.	Parameter	Formula			Values			Ĭ	Total	Remarks/ Source
	← 0	Population (2017)	∢ ۵			2273117				DPR	DPR Metro, 2017
	3 6	Total Person Trips	C = AxB			2159462				ך ד	UPR WEITO, 2017
	4	Vehicular Trips									
	а	Н		Car/Jeep/Van	2 Wheeler	Auto	Bus	E-rick			
	q	Share	۵	%00.6	59.43%	21.29%	6.71%	3.57%		DPR	DPR Metro, 2017
(1-	O	Occupancy	ш	2.38	1.23	2.11	32.15	2		Agra 2017	Agra CMP Draft Final Report, 2017
ı) s	p		F = (CxD)/E	81660	1043364	217847	4510	15425			
NO	22	Average Trip Length (kms)	9		4	4.23				Agra (Agra CMP Draft Report, 2017
ISS	o	Modes Modes		Car/.leep/van	2Wheeler	Auto	Bus	E-rick			
IW:	9	+	H=FxG	345423	4413429	921492	19077	65247			
Jλ	7									_	
TIO	а		-	133.6	31.065	77.17	789.18	0.08			
Α:	q	_	=	0.028	0.023	0.20	1.38	0.00			
ЯТІ	0	-	:	0.344	0.112	0.56	11.96	0.00		ARAI, 2011	2011
NI.	D Q	CO	≥ >	0.267	0.790	1.89	1.60	0.00			
	∞									_	
	g	╁	l'= H x i	46.15	137.10	71.11	15.06	0.01	26	269.42	
	q	H	J¹= H x ii	0.01	0.10	0.19	0.03	0.00	0	0.32	
	O		K¹= H x iii	0.12	0.49	0.51	0.23	0.00		1.36	
	р		L1= H x iv	0.09	3.49	1.74	0.03	0.00	5	5.35	
	р		M¹=H×v	0.84	5.09	4.12	0.15	0.00	7	0.20	
	-	Total Peak Hour Vehicular Trips (External - Internal & Internal - External)	Ø			14907				DPR	DPR Metro, 2017
	2	Peak Hour Share	q			080.0				Agra 2017	Agra CMP Draft Final Report, 2017
	3	Total daily trips	c = a/b			186338					
	4	Average Trip Length (kms)	p			11.5				Assur	Assumption
(2	Vehicular Trips									
l-3	В	\dashv		Car/Jeep/van	2Wheeler	Autos	Buses	Trucks	Tractors		
'3-I)	q	Share	ø	25.0%	49.8%	%9.0	2.5%	17.7%	1.5%	NH-21	1 Traffic Survey Data,
SN	,	Modal Trips / Vehicular Trips	f=c x e	46585	92796	1118	10193	32982	2702		
ois	٥	Venicle Kms-travelled		Carl loonlyan	2)Mboolor	204114	Bucos	Trioko	Tractore	_	
SIV	q	+	q=fxd	535722	1067158	12857	117216	379291	31072		
I3 .	7	Н									
ΥTI	а		1	133.6	31.065	77.17	789.18	•			
၁	q	_	2	0.028	0.023	0.20	1.38	3.98	4.46		
HEN	S	\dashv	က	0.344	0.112	0.56	11.96	28.31	30.8		ARAI, 2011
NI	5 0		+ 14	2.444	1.153	4.47	8.00	17.39	19.76		
	o	+	,)		;)	>	-	
	, w	+	2=q x 1	71.57	33.15	66:0	92.50		191	198.22	
	s Q	Н	$J^2 = g \times 2$	0.02	0.02	00:00	0.16	1.51		1.85	
	O	\vdash	$K^2 = g \times 3$	0.18	0.12	0.01	1.40	10.74	0.96	13.41	
	Р	-	L2= g x 4	0.14	0.84	0.02	0.19	,		1.20	
	Φ	CO (Tons/day)	M²=g×5	1.31	1.23	0.06	0.94	6.60	0.61 10	10.74	

Annexure of Chapter 5

Annexure 5.1: Works undertaken by Archaeological Survey of India at Taj Mahal during the last six months

The Archaeological Survey of India undertakes regular conservation and chemical preservation works at the Taj Mahal. The following works have been taken up by the ASI during the last six months:

- 1. Direction signage and cultural notice boards prepared in red sand stone and white marble base.
- 2. Stained pointing on red sand stonework in prayer hall have been completed. Red sand stone jail & mutakka in missing part in Sarhindi Begum, Saheli Burj of North East side were fixed. Replacement of old & decayed pan dasa, pillar base, pillar cap and pillar in East side Verandah of Sarhind Begam, Saheli Burj and North and East Side verandah of Fatehpuri Masjid have been done.
- 3. Damaged and missing red sand stone jail railing and muttakka have been replaced with new. Also weathered flooring stone as *Nav* and star design have been provided new in place of old & decayed. Stained pointing in red stonewall and white marble dome of Mehman Khana is in Progress.
- 4. Stained pointing in basement of north-east and north-west side burji has been done. Replacement of flooring stone as *Nav*& Star design in front of Mosque is completed.
- 5. Red sandstone ramp over MS Iron frame for easy going to tourists near West side toilet block, main entrance gate, exit gate, both side pathway and at forecourt are provided.
- 6. Fixing of red sandstone floral design panel, fixing of missing different type inlay pieces in South facing of Royal Gate has been completed.
- Flooring repairs has been on pathway between main mausoleum and Royal gate-by replacing red sand stone flooring stone as *Nav*, square and star design in place of decayed stone pieces.
- 8. Removal of settled debris from Rewati-ka-Bara for development of East side facilities center for visitors. The work is in progress and 90% of work is completed.
- Providing red and stone floor and erecting tin shade for prepare facilities center in-front of west gate and south side of Sarhind Begam, Saheli Burj work is in progress and 95 % work is completed.

10. Emergency repairs of damaged structural parts due to Cyclone on dated 11/04/2018 at Taj Mahal, Agra. The work started immediately and 75% completed and remaining work will be completed by 15/08/2018.

The following works are proposed to be taken up during this current financial year:

- Providing concertina coil & grill fencing to the security check arrangement at East & West Gate Taj Mahal, Agra.
- 2. Providing Heron rib mat in main mausoleum & marble platform of TajMahal, Agra.
- 3. Repairs to north-west Minar of TajMahal, Agra.
- 4. Restoration of old drainage of lower part of Taj Mahal, Agra under process in circle office.
- 5. Repairs to Domes of MehmanKhana at Taj Mahal, Agra.
- 6. Repairs to Dalans of Taj Quardangle at Taj Mahal, Agra.
- 7. Repairs to Red Sand Stone Ramps for Chamali Floor at Taj Mahal, Agra.
- 8. Structural Repair of Main Mausoleum dome during cleaning work by Science branch at Taj Mahal, Agra.
- 9. Providing and fixing Red sand stone Ramps for entry for Namazi at Taj Mahal, Agra.
- 10. Repairs to Outer Façade of Taj museum (Western Naubat Khana) at Taj Mahal, Agra.
- 11. Conservation of Burj on the East of Main Entrance Gate at Taj Mahal, Agra.

The Science Branch of the ASI has taken up the scientific treatment at different parts of the Taj Mahal apart from the above Civil Works, which includes the following:

- 1. Scientific cleaning and preservation of all four minarets of the Taj Mahal
- 2. Facades of all the sides, total 8 numbers have also been cleaned. Scientific Conservation at Four Pedestal walls Taj Mahal also completed.
- Scientific treatment & Cleaning of the Interior (up to the human height of the Mausoleum (all chambers of periphery of inner dome and floral panels) have also been taken up and completed.
- 4. The scientific cleaning and scientific conservation of four chhatries of Roof Top, Taj Mahal Agra is in progress.
- 5. The scientific conservation of main dome & pinnacle of the Taj Mahal will be initiated after outcome of technical / structural studies.

Annexure of Chapter 6

Annexure 6.1: Review of Master Plans for cities and towns in TTZ

Specific provisions for Historic Areas and, Ecological Sensitive Areas and Environmental Aspects

Town/City	Master Plan	Specific Provisions for Historic Areas	Specific Provisions for Ecological
	Document Name and Year		Sensitive Areas and Environmental Aspects
			, reposit
Agra	Master Plan 2021	 Delineation of Taj Dharohar Kshetra and proposal for perineal flow of river within the delineated area for tourist attraction The industrial units located in the precinct are to be relocated phase wise in the Master plan demarcated industrial zones Retaining the exiting residential areas from the precinct and reserved as residential land use in the Master Plan. Commercial establishments and complexes located on the road extending from water works Chauraha to Jiwani mandi chauraha are to be retained. The development of such areas must be controlled and regulated. Proposal for the beautification, improvement and infrastructure is made for the slums located in the region. The following architectural regulations are implied in this area: A buffer of 100m must be followed around the ASI protected monuments and no construction should be allowed within the 100m buffer. The area between 100m to 300m, buildings upto 3.75m or 1 floor high are allowed as per the ASI approval. The rest of the area must follow the land-use and building heights as per the master plan and no construction above two floors or 7.5m should be allowed. 	 Any unauthorised development in the reserved green belt areas would be demolished as per the Order of the Supreme Court and the land use of such areas would be as per the 2021 master plan. Being a part of the Taj Trapezium zone the city can only host pollution free industries. The industrial activity in the city is primarily concentrated in areas such as Mathura road, Aligarh road and Nunihai road. Pollution free industustries are proposed in Mathura Marg and Trans Yamuna region because of concentration of industries in these areas. A barrage is proposed downstream of Yamuna in order to have a perinnial flow of water in the Yamuna so as to create recreational opportunities. The north of Taj Mahal across the river is to developed into a national park in a way so it becomes a centre of interest for tourists. A total 178.18 hectares of land is reserved on Fatehabad road to tourism related activities, recreation activities etc.

- The proposed buildings in the precinct must follow an elevation/facade of Mughal style.
- The width the river in Agra is not uniform throughout the city and around Taj Mahal. Thus, Technical assistance to be taken to propose a bund and parts of flood prone area is proposed to reclaimed which can be proposed as a planned 'Green park' and allied recreational facilities/activities.
- A national park has been opposed north of Taj mahal, across the river and including Mehtab bagh, Charbagh etc.
- To maintain the perennial flow of the Yamuna river a barrage has been proposed downstream of Taj mahal, so as to maintain the required level and flow of water in order to establish recreational activities and facilitate boat rides in the river.
- Any new construction is prohibited with 500m of Taj Mahal and no extension or rebuilding would be permitted for the existing buildings in the area.
- Most of the proposed Taj Heritage is connected with roads, but the remaining part can also be connected with a road along the proposed bund and with the proposed barrage downstream, so as to create a tourist circuit in this area with the help of these routes.
- Beautification and provision of services in the routes adjoining Tajmahal from Tajganj, so as to create tourism opportunities and as far as possible the area should be reserved for pedestrian use and activity only.
- Other Provisions

- In order to attarct tourists, an international level gourse course and stadium is proposed where programmes of international stature can be hosted.
- There are no spesific locateions reserved in the master plan for the stadium but as per the consultation with agriculatural experts it is proposed to locate these projects in the agricultural land.
- The international airport is proposed on agricultural land after consulting with experts and concerned departments/ministiries.
- A barrage is propsoed in Dayal Bagh area and upstream of Taj Mahal so as to maintain constatnt supply of of water in the Yamuna in and around Taj mahar from a tourism perspective.
- A bridge is also proposed in the upstrema barrage so as to connect Agra with Aligarh road near Dayal bagh.
- Regional park is proposed in Mathura marg
- Zonal park is proposed in place of proposed small scale industries near Taj Mahal while creating zonal development plan.
- Amusement park has been proposed to the Yamuna River east of the proposed 100 m road on the northern part of Mathura Marg.
- National park is proposed north of Taj Mahal across the Yamuna River where 143.36 hectares of land is reserved for

- In order to maintain the residential zones in existing built use zone as it is, it is proposed to declare these areas as high density residential use zone in the 2021 master plan.
- Proposal to move all the existing whole sale commerce outside the city limits in the demarcated whole sale commerce zone in the master plan 2021 and it would be appropriate to replace these by retail outlets with proper planned parking facility and any other services
- The primary roads in the old residential area demarcated as market streets in the current master plan where proper provisions for parking etc are to be done and mixed land use is allowed.
- High Density Residential: The 2021 master plan incorporates the old high density residential areas and reserves it as high density residential zone that includes neighborhoods such as Belaganj, Ghatiya Azam Khan, Pathwari, Fubbara, Daresi, Noori Rajamandi, Gate, Lohamandi, Golkura Park, Naai Mantola, Sadar Bhatti, Balugani, Naamner, Cheepitola, Roshan Mohalla, Kuchehri Ghat, Jeewani Mandi, Kala Mahal, Gugdi Mansoor Khan etc.
- Medium Density Residential: The areas adjacent to the old residential neighbourhoods (demarcated as high density residential) and have been developing in the past years are reserved for medium density residential use. A density of 300 people per hectare is proposed for these areas.

- development of tourism and recreational activities.
- Aprropriate water harvesting techniques are to be adopted in order to conserve and recharge ground water in the city.
- Barrage is proposed upstream of Yamuna and other water harvesting measures are to be atken in other areas to conserve and recharge ground wate rin the city.
- It is proposed to tap the drain water and untretaed sewage being discharged into yamuna and release it at the downstream after treatment.
- It is proposed to create a green buffer of 3m on either side of the open drains in the city.
- It is proposed to mark/list and conserve all the natural catchments, lakes etc in the city and no other use is to be allowed in these areas.
- It is proposed to develop the sites around the catchment areas, lakes and other water bodies for recreational purposes so as to benefit the residents in the city.
- Such tree/plant species are to be selected for roads and parks for plantation that require minimum water and remain green throughout the summer.
- It is proposed to use Brick on edge/loose pavements on road edges for ground water recharge.
- Rain water is to be made mandatory for any dvelopement of 1000 sqm and above site area through perculation pits.

- The wholesale commercial activity in the Fubbara Area of zone 1, including Jama masjid area and Loha mandi area need to be relocated phase wise in the wholesale commercial zone of proposed master plan and replaced with retail commerce with appropriate services.
- There are market streets proposed all over the city of 50m, 100m and 30m width considering the growing commercial activity in the exiting built inner city areas, particularly in zone 1.
- A 30m wide market street is proposed for MG marg in zone 1 and rest of the market street are proposed to be 18m wide. The setbacks and other regulations would be applicable as per the residential building norms, but a minimum front set back of 7.5m is to be maintained in MG marg while 6m is for other market streets.

Tourism

- While looking at the above table, it is clear that heritage sites except Taj Mahal and the Agra fort have been unable to attarct tourists. The main reason for this is the transport related issues in the city.
- It has also been noticed that most of the tourist depart from the city the same evening of the arrival as its close to Delhi and Jaipur.
- The primary reason for the early departure of the tourists is the lack of other tourism opportuniteis and activities in the city as its available in cities like Delhi and Jaipur.
- In order to access the the city's historic sites, it is proposed to

- Rain water harvesting should also be made mandatory for government offices built in the future and a rooftop rain harvesting system is to be adopted in the exiting adminirtative buildings.
- In order to save Yamuna from pollution, the drains discharged in the river must be taped and it is suggested to release them downstream beyond the proposed barrage.

		develop appropriate routes and conserve/protect the historic sites along the Yamuna bank by creating a Taj Dharohar Kshetra around these sites where easy access routes are proposed for a pleasant experience of the tourists. Taj ganj is to be developed, beutified in a way to attract tourism and becomes a centre for handicraft industries, arts and crafts related objects/items. It is proposed to develop sites like Sur-Sarovar word sanctuary (Kitham Lake), Surkuti, Renuka ji ka mandir etc and aread around them. It is proposed to make surface parking provisions in the main commercial centres of the city located in the old city areas.	
Bhartpur	Bharatpur MPD 2023	 Proposal for decentralization of commercial activities by not allowing vehicular access in inner city while utilizing ring road. Both historical and culturally significant sites and commercial node are overlapping within circular road and defined as old city sub zone (p.28). Provision of basic infrastructure. 	 No polluting industry is permissible in 20kms radius from Keoladeo National Park Proposing for making ecologically sensitive areas with natural flows, old ponds and kunds free from any encroachment. Also, maintaining and preserving the same. Low lying areas should see sustainable future development proposals. Proposal of botanical gardens and parks in area surrounding Keoladeo National Park. Green belt proposal along NH 11, state highways and important roads.

Firozabad Firozabad Shikohabad Master Plan 2031

- In order to keep the already built zones as residential, the Firozbaad Shikohabad master plan 2031 identifies these areas as residential built zones.
- The existing wholesale activity in these zones is to be relocated to the peripheral areas and replaced with retail use with proper provision of parking and other services.
- A density of 500 people per hectare is proposed for these residential areas.
- The primary roads in the existing built areas in zone 1 of the two cities are proposed as market streets and the building along these roads have experienced a high commercial activity in the past. These markets streets would continue to host retail commercial use in the ground floor with proper parking provisions while the upper floors would host residential use.
- A bypass road of 64m width is proposed north of Firozabad so as to cut down the traffic from the city center.
- Settlements housing weaker and low income group section of the society are allowed to have service and cottage industries on the ground floor as per the zoning regulations.
- There are no registrations done for integrated and high-tech townships in the city and no interest is seen as of now for any such development.

- Being part of the Taj Trapezium zone, all large scale or polluting industries are prohibited in Firozabad.
- An area of 741 hectares is proposed in Mauja Dholapur on Agra road, Mauja Mouniddinpur on Jalesar road, Mauja Pampura Raipura on fatehabad road, Mauja Kishanpur, Jilauji, Mohammadpur Nabada on amraitha road are proposed for non-polluting small scale and service industries.
- There is a huge deficit of parks and open spaces in the city, thus regional park, sector parks and zonal parks are proposed in the city. A regional park of 307.2 Hectares is proposed in Mauja Nagla Hariya.
- Sector parks are proposed in each sector of the city. A zonal park of 228.6 hectares is proposed in Mauja Lalau.
- A 30m wide strip of green buffer is proposed on either side of the proposed bypass road so as to control ribbon development.
- A greenbelt around the trenching ground in the city is also proposed.
- Only 50% of the city has access to piped water system.
- A comprehensive network of water distribution is to be planned, therefore new tube wells need to be built

- and old tube wells need to be maintained.
- Citizen awareness programmes need to be put in place for waste water management.
- Drains are encroached upon for construction activity bν the shopkeepers in the core city areas, due to which cleaning and management of these drain gets difficult. Appropriate measures need to be taken in this regard.
- Proposal to cover and raise the drains in order to prevent them from dumping of solid waste and dust collection.
- A drainage plan needs to be prepared for the city where cleaning of drains, repair work/lining of existing drains, proposal for new drains etc. is to be discussed in detail.
- A solid waste management strategy needs to be worked with the help of specialist and prevention of garbage dumping in drains is to be done.
- Water harvesting proposal similar to Agra Master plan*
- It is proposed to mark/list and conserve all the natural catchments, lakes etc in the city and no other use is to be allowed in these areas.
- It is proposed to develop the sites around the catchment areas, lakes and other water bodies for

			recreational purposes so as to benefit the residents in the city. Such tree/plant species are to be selected for roads and parks for plantation that require minimum water and remain green throughout the summer. It is proposed to use Brick on edge/loose pavements on road edges for ground water recharge. Rain water is to be made mandatory for any dvelopement of 1000 sqm and above site area through perculation pits. It is proposed to follow the earthquake resistant construction regulations in the city.
Mathura and Vrindravan (First seven bullets are specific to Vrindavan)	Mathura- Vrindavan MPD 2021 (Part 1)	 Written delineation of heritage precinct is defined (p.42)(not for Mathura). Proposal for regular conservation and beautification of historic, cultural and religiously significant buildings. Preparation of detailed plans to prevent encroachment and conservation in inner city. Revitalization and beautification of ghats in heritage precinct. Provision of basic infrastructure for both, citizens and pilgrims. Pedestrianisation of narrow lanes in inner city with no vehicular access. Proposal for complete ban of mobile hawkers and small unauthorized shops. Provision of parking space in the outskirts of heritage precinct. To maintain the density, open spaces shall be regulated. 	 Control on sporadic unauthorized growth with maintenance and beautification of open spaces. Short height Tree plantation shall be sensitive to the species selected from Braj region. Proposal to preserve and maintain present forest areas. Overcome the loss in green cover, trees and plants mentioned in Braj historic literature shall be planted along kunds, yatra routs, conserved mounds and available open spaces. Preservation and protection of forest areas, nallahs and ponds with the provision of open spaces and parks. Conservation of Yamuna flood plains.

		Provision for street lights and their maintenance.
		Provision for maintaining the
		hygiene of inner lanes and roads.
		Place making proposals for towards and plantation of trace in
		tourists and plantation of trees in open spaces is proposed.
		Conservation of dilapidated
		structures
		Renovation and revitalization of
		structures.
		Present development at such sites
		shall be in view of long term vision
		which shall not contradict the
		historic context.
		100 m and 200 m restricted and and appropriate affects
		regulated conservation offsets shall be followed.
		Pathways leading to significant
		sites shall have min. 3.6m width.
		Min. set back of 1.2 m for
		upcoming development.
		Development of UD guidelines in
		separate provision.
		No vehicular access for paths less
		than 12 m and provision for
		parking shall be made.Adhering to building line.
		Redevelopment shall adhere to
		existing elevations with pictures.
		Other than significant buildings,
		rest of the buildings shall have
		max. 7.5 m height.
Govardhan	Mathura-	• Street section of 18m wide • Proposal for various green
	Vrindavan MPD	Parikrama marg is given (p.16-17) spaces
	2021 (Part 3)	Delineated historic core in master Proposal of 15m wide green belt on both sides of parity small.
		 plan. belt on both sides of parikrama Building regulations for setback route and 45m wide bypass
		and plantation is proposed for road.
		development along parikrama • Mentioned ecologically
		route. significant sites (kunds).
		No development (temporary or
		permanent) is permissible
		between Goverdhan hillock and
		parikrama route.Front elevation controls.
		 Front elevation controls. Mentioned historically significant
		sites.
		5.555.

Hathras	Hathras Master Plan- 2021	 The old existing settlements in the city are proposed as high density residential zones due to existing high built up density. From R.D. college road to turn to Mandi Samiti onAgra-Aligarh road, from Ghantaghar to Karwal road are proposed as Market Street. A depth of 24m on either side of streets of 18m width or more are proposed as market streets in the existing built zones. A minimum front set back of 6m is to be maintained in all the properties at the market street. 	 Proposal of regional, sector and zonal parks Drains are encroached upon for construction activity by the shopkeepers in the core city areas, due to which cleaning and management of these

Annexure 6.2: Summary & Review of Other Relevant Documents

6.2.1 Agra Development control Regulations 2008

Remarks

The document provides generic guidelines for the city and does not take any special demarcated area into consideration. The building bye laws for the city are general building bye laws by the UP town and country planning department and do not collate with the master plan proposals. There is no discussion or provision of development controls, regulation or guidelines of Taj Dharohar Kshetra or mention of TTZ in the Agra building bye laws. Lack of any specific guidelines or regulation controls for conservation of heritage buildings, precincts and character zones is evident. No urban design guidelines for the historic core, streetscape guidelines, pedestrian improvement regulations etc. are discusses. The Development control regulations lack a context and there is an immediate need to prepare city specific building control regulations with special focus on public spaces, mixed use districts, heritage precincts, character zones and Taj Dharohar Khetra.

6.2.2 Other cities Development control regulations

Remarks

All the other cities in TTZ follow a similar template as Agra Building and Development control regulations and lack context specific provisions. There is an immediate need to prepare city specific building control regulations respecting their differential histories, ecology, socio-economic profile, tangible-intangible heritage, cultural practices etc.

6.2.3 Zonal Development plans

6.2.3.1 ZDP 2021-Zone 2

Proposals

- Incorporation of unorganized growth in master plan
- Demolition of unauthorized construction in the green belt
- Commercial street is proposed for road width more than 30m for the depth of 50m
- Typical cross section Proposal for 24m and 30m wide road that includes green belt, service lanes and footpath but no multipurpose zone, Para transit infrastructure (stand, pathway, stops) or designated cycling path.
- Proposal for Community hall and community centres with 50% area of the site designated for parking
- Paliwal park is one of the main open spaces located in the zone
- All unauthorised construction on the ROW of the drains would be demolished.
- All natural catchments, ponds and water bodies are to be identified and conserved. No other
 use of such features is permitted.
- As far as possible, the historic ponds, lakes, and catchments are to be developed for tourism and recreation for public access.
- For any development above 20 acres, 5% of the land is to be utilised for water body. The minimum area of such water bodies should be 1 acre and depth 6m.
- Not more 5% of the parks are to be concretised.

- Tree species along the road and for open spaces are to be selected as such they remain throughout the year even during summers.
- A 3m wide tree plantation is to be done on either side of the open drains all throughout the city.
- Tree plantation on either side of the main roads/streets.
- Proposed Bazaar streets are to be used for mixed use, GF-commercial, upper floorsresidential.
- No high-tech townships are proposed in zone 2, only in zone 6 and 3.
- No integrated townships are located in zone 2
- Due to Sikandra and Mariyam tomb, zone 2 is important for tourism because of which various 5-start hotels, high class restaurants, and household industries are located in this region.
- There is a proposal for the beautification of area adjacent to Sikandra and Mariyam tomb to attract tourism.

Remarks

The proposals are generic in nature and lack any context. There is a need for comprehensive understanding of the zone and its unique requirements. The Larger heading are similar and no different approach has been adopted based on different zones and their context. Discussion about form, space, image or character should be incorporated in the plan. The proposals are missing larger imagination or overarching vision and ideology.

6.2.3.2 ZDP 2021-Zone 6

Proposals

- Incorporation of unorganized growth in master plan
- Demolition of unauthorized construction in the green belt
- Commercial street is proposed for road width more than 30m for the depth of 50m
- Proposal for service lanes
- Improvement of cultural industries and existing tourist infrastructure
- Widening of various roads around Taj
 - o Shamshabad road: Amar hotel to JP hotel 30 m and JP hotel till bypass road, 45m
 - o Fatehabad road: Amar hotel to JP hotel 36.6 m and JP till bypass road, 45m for 100m
- Proposal for live-work relationship
- Application of neighborhood concept in 11 sub sectors of zone 6
- Existing shilp gram, developed by tourism department, is a space dedicated to cultural activities such as display and selling of regional cultural goods near Taj and the festival called Taj Mahutsav.

Remarks

The zonal plan follows similar structure as of Master Plan which does not include specific spatial and form based recommendations. No tourism and cultural specific proposals are mentioned while considering this zone as Taj specific zone. However, generic and overarching considerations are included. Also, important proposals for ecologically significant features are missing. Discussion on overall movement flows, crowd management and paratransit facilities is required. There is a scope in this zonal plan for the betterment of inhabitants and their livelihood as well as overall experience of the Taj precinct.

6.2.4 Tourism Policies and Proposals

6.2.4.1 Uttar Pradesh Tourism Policy 2018

Following are TTZ region specific highlights of Uttar Pradesh Tourism policies:

- To establish brand Uttar Pradesh (*U.P. Nahi Dekha To India Nahi Dekha*) while creating a sustainable, pro-growth, and pro-poor ecosystem.
- Vision is to establish Uttar Pradesh as a preferred tourism destination in India, and achieve country's highest tourist arrival and tourist receipts, driving employment generation and ensuring best visitor experience.
- Following are the few targets:
 - o To convert 10 heritage buildings to heritage hotels per year.
 - To improve local entrepreneurship avenues, through execution of tourism events and festivals such as Rangotsav Barsana and Taj Mahotsave. To promote city-wise events and festivals with predefined calendar, and promoting the same.
- Validity period of this policy is for five years.
- Following are few strategies:
 - Strengthening of tourism infrastructure:
 - Encouraging participation through PPP mode
 - Upgradation of tourist infrastructure in a planned manner at identified areas, coming under 5-10 KM radius of major tourist spots.
 - Using WB project of pro-poor tourism, the economic upliftment of the less privileged, through inclusive development, planning of tourist assets and infrastructure.
 - Connection of remote tourism destination with modern infrastructure.
 - o Promoting investments and employment generation
 - CSR initiatives shall be promoted in the tourism sector.
 - o Augmenting brand Uttar Pradesh
 - To adopt top-down approach
 - Focus on religious/spiritual tourism
 - Establishment of shrine board
 - Promoting theme based tourism
 - Eco tourism: engagement of local communities to ensure equitable distribution of benefits and socio-economic upliftment of the locals.
 - Heritage tourism: Work with architects and ASI to undertake restoration projects of underdeveloped potential tourists sites
 - Cultural tourism: to promote cultural exchange, annual calendar will be released
 - Weekend tourism: considering nearby destinations from key locations

City →	Pilgrimage	Historical	Eco Tourism
Lucknow	Ayodhya Kichocha Sharif Dewa Sharif Naimisharanya Bithoor	Lucknow Bithoor, Gorakhpur Faizabad	Kishanpur Wildlife Sanctuary Dudhwa National Park Nawabganj Wildlife Sanctuary Katarniaghat Wildlife Sanctuary Suhelwa Wildlife Sanctuary Samaspur Wildlife Sanctuary Kukrail
Noida and Ghaziabad	1. Mathura 2. Vrindavan 3. Garhmukteshwar 4. Barsana 5. Nandgaon 6. Govardhan 7. Shukratal 8. Shakumbhari Devi 9. Bateshwar	1. Agra 2. Fatehpur Sikri 3. Sikandra 4. Bateshwar 5. Bah	Chambal National Park Sur Sarovar Wildlife Sanctuary (Keetham) Okhla Wildlife Sanctuary Patna Wildlife Sanctuary Hastinapur Wildlife Sanctuary Amangarh Tiger Reserve

- Sustainable tourism through community growth and up-gradation of local skills
 - To ensure benefits to the local community on economic, social and environmental fronts.

Supporting pillars:

 Premium tourism transport (Hop-on and Hop-off bus service, identifying new air sector identified to and from Agra, 4 lane highway connectivity to all destinations, connecting all major destinations with High speed railway to NCR)

Proposed Projects

- Smart ticketing system
- Sound and light show/laser show project
- City centre observatory (Giant ferris wheel such as London eye)

Remarks

Following are observations on the Tourism Policy from the perspective of TTZ specfic context and local physical and cultural attributes:

The policy document is well structured and encompasses various measures to promote sustainable tourism in Uttar Pradesh. However, due to the poor implementation through Master plans and Development plans, the on ground condition of tourist infrastructure, facilities and other schemes is not up to the mark. Also, due to the operation of two different state tourism agencies (Uttar Pradesh and Rajasthan) the comprehensive tourism policies of the region are segregated. However, if integrated the larger regional benefits from tourism will be realized. Bharatpur and Deeg remain isolated due to the change in policies for larger tourist circuits.

Proposals such as Ferris wheels such as 'London eye' should be realized contextually and respect the overall form of the city. The policy takes a top-down approach but should rather consider a bottom-up approach in conjunction with local communities and indigenous cultural attributes.

6.2.4.2 Agra Master Plan 2021: Tourism proposals

Following are the highlights of the tourism section in the Agra master plan 2021:

Tourist a	rrival at Main He	ritage sites			
Year	Taj Mahal	Agra Fort	Sikanadra	Itmad-ud-daula	Rambagh
1997	1554223	652958	152286	68492	
1998	1657985	874402	156969	65219	4524

^{*}Validity period of this policy is for five years.

1999	1746455	853876	180364	65219	5828
2000	2011599	971030	260139	64831	6860
2001	2226225	1090722	317154	84178	6666

- While looking at the above table, it is clear that heritage sites except Taj Mahal and the Agra
 fort have been unable to attarct tourists. The main reason for this is the transport related
 issues in the city.
- It has also been noticed that most of the tourist depart from the city the same evening of the arrival as its close to Delhi and Jaipur.
- The primary reason for the early departure of the tourists is the lack of other tourism opportunities and activities in the city as its available in cities like Delhi and Jaipur.
- Most of the hotels in the city are located in fatehabad road, Rajamandi station, Taj road, Mall road and Mahatma Gandhi road.

Proposal

- In order to access the the city's historic sites, it is proposed to develop appropriate routes and
 conserve/protect the historic sites along the Yamuna bank by creating a Taj Dharohar Kshetra
 around these sites where easy access routes are proposed for a pleasant experience of the
 tourists.
- It is thought suitable to propose a barrage downstream of Yamuna in order to have a perinnial flow of water in the Yamuna so as to create recreational opportunities.
- The north of Taj Mahal across the river is to developed into a national park in a way so it becomes a centre of interest for tourists.
- A total 178.18 hectares of land is reserved on Fatehabad road to tourism related activities, recreation activities etc.
- In order to attarct tourists, an international level gourse course and stadium is proposed where programmes of international stature can be hosted. There are no spesific locateions reserved or propsed in the master plan for this but as per the consultation with agriculatural experts it is proposed to locate these projects in the agricultural land.
- An international airport is to be set up in the city in order to directly connect it with important cities in the county and around the globe. The airport is proposed on agricultural land after consulting with experts and concerned departments/ministiries.
- Taj ganj is to be developed, beutified in a way to attract tourism and becomes a centre for handicraft industries, arts and crafts related objects/items.
- It is proposed to develop sites like Sur-Sarovar word sanctuary (Kitham Lake), Surkuti, Renuka ji ka mandir etc and aread around them.

Remarks

There is a gap between the tourism policy of Uttar Pradesh and its implementation through proposed projects through master plan in the city. An aggressive brand marketing of the Taj by the state and tourism agencies, lack of recreational opportunities and degrading nature of the city may account for the fact that out of the total daily tourist arrivals in the city, most of them leave after visiting only the Taj Mahal. It has also been noticed that most of the tourist depart from the city the same evening of the arrival after visiting three major monuments in the city (Taj Mahal, Agra Fort, Itmad-ud-daula Tomb) as its close to Delhi and Jaipur. The annual footfall of visitors in Itmad-ud-daula tomb and Agra fort is 3.7% and 49% respectively, of the footfall of Taj Mahal. The heritage tourism in the city has failed to provide any economic or community revival to the city. The city is unable to convert World

Heritage designation into proportionate advances in local community development in a context where it is most needed. The planning agendas in the city are unable to find a balance between the tourism and everydayness of the city and there is a lack of a pro-poor, community-based heritage tourism and comprehensive vision for the city. It is evident from the proposed projects and provisions that the Master Plan is influenced by the 'Global Tourist Agra' image with both the state and planners trying to accommodate global agendas. Strengthening of communities to truly get benefitted from the existing three world heritage sites in the city shall be pushed.

The document provides a point based approach and does not provide a comprehensive tourism strategy and overarching vision for the city.

6.2.4.3 Rajasthan Tourism Unit Policy 2015

The highlights of the policy are as follows;

Provisions for conversion of land for tourism units are given

- No conversion charges shall be payable for land held by tenant for establishment of a tourism unit in urban as well as in rural areas.
- o Issue of conversion orders for existing and operating heritage hotels/buildings.
- No fee for change in land use for conversion of residential land and heritage properties into hotels.
- Heritage hotels situated on narrow roads in urban areas which arrange for a dedicated alternative parking on a 40/60 feet wide road and provide for the park-and-ride system from hotel to parking place, shall be permitted to operate.
- Permissible Area for Commercial Use by Heritage Properties: Heritage hotels can commercially convert maximum of 1000 sq meters or 10% of plinth area of the existing heritage building, whichever is less.
- Properties: Owners of heritage properties who do not have a legal Patta for claiming ownership of those Heritage properties would be given lease/free hold rights
- Double FAR for tourism units
- Regularization of Existing Hotel Units
- All Tourism Units registered with the Department of Tourism will be directly eligible to become training partners under the Employment Linked Skill Training Program (ELSTP) subject to availability of infrastructure as per the guidelines of Rajasthan Skill and Livelihoods Development Corporation (RSLDC).
- This Policy will remain in force for five years from the date of issue

Rajasthan Investment Promotion Scheme, 2014

- In order to promote investment in the State of Rajasthan, and to generate employment opportunities through such investment, the Rajasthan Investment Promotion Scheme, 2014 (RIPS 2014) is issued
- o The Scheme shall promote investment made by Enterprise(s) for establishment of new unit and/or investment made by the existing Enterprise(s) for expansion and/or investment made for revival of sick enterprise.
- An eligible service enterprise shall be granted benefits and incentives for reimbursement of 50% VAT, Exemption from payment of 50% of Entertainment Tax, Electricity Duty, Land Tax, Stamp Duty etc. for seven years.
- Special Provisions for Women, Scheduled Castes, Scheduled Tribes and Persons with Disability Enterprise.
- o Benefits to Enterprises in Backward and Most Backward Areas.
- o Benefits to Manufacturing Enterprises in Thrust Sectors

Remarks

The Rajasthan Tourism Unit Policy, 2015 primarily addresses issues relating to time bound conversion of land for tourism units including new hotels and heritage hotels, time bound approval of building plans, grant of Patta to heritage hotels, allotment of land for tourism units on DLC (District Level Committee) rates, applicability of Rajasthan Investment Promotion Scheme, 2014 (RIPS-2014) for tourism units and smooth and speedy implementation of the provisions of related departments like Revenue, Urban Development and Housing (UDH) & Local Self Government (LSG), Panchayati Raj, etc.

It includes provisions for providing incentives to selected enterprises and manufacturing enterprises in thrust sector. It also gives special provisions for Women, Scheduled Castes, Scheduled Tribes and Persons with Disability Enterprise. Special benefits to backward classes, most backward areas is also provided in the policy document. The policy enables a good shell structure for the establishment and operation of tourism enterprises in the state.

The policy document should include TTZ specific recommendations.

6.2.5 Comprehensive Environmental Management Plan (CEMP) For Taj Trapezium Zone (TTZ) Area – NEERI Report

Major issues highlighted of the report are as follows:

- Shifting of small-scale industries out of the TTZ would kill the small industries, directly effecting 305 entrepreneurs, 57,800 workers and their families.
- In Firozabad city, highest pollution is observed at industrial area site followed by the residential area and the lowest at the mixed used area site.
- There are about 180 glass based industries in Firozabad manufacturing mainly glass bangles, glass beads, glass rods, glass tubes/shell, glass wares and glass blocks. DG sets are installed in almost all the glass industries in Firozabad District, which are mostly based on natural Gas.
- A major chunk of Firozabad's population is dependent on these units for livelihood through various inter-connected bangle manufacturing and allied activities and disturbance in one activity affects all the others.
- Mathura Refinery is the largest source of air pollution in Mathura. Besides, there are other small & medium scale industries in the region.
- Due to proximity to the Keoladeo National Park, industries could not be developed in the Bharatpur region.
- In Agra, besides Foundries, there are nearly 120 Petha (sweet item) manufacturing units, and also more than 2000 Halwaiis, 500 Kumhars and Bharbhujas, which use coal, cow dung, wood and agro-wastes.
- Other than industries, vehicular population is the major contributor to air pollution in Agra.
- Movement of inter-city vehicles for tourist as well as commercial activities also result in significant air pollution through vehicle exhausts.
- The pollutants emanate from a large number of sources in TTZ, categorized under industries, vehicular, area sources (including DG Sets).
- Though several measures have been taken in the past to control air pollution in the TTZ area, however with the growth in residential as well as floating population in the region shall continue to result in enhanced activities, thus putting pressure on the environment of the TTZ area.
- Absence of public toilets & urinals

- The water flow characteristics of Yamuna River changes significantly from monsoon to nonmonsoon seasons. This change in water flow along with the construction of various barrages hampers the continuous flow of the river. Thus, in dry season (almost nine months), the river becomes segmented in four distinguished independent segments.
- As the water demand will increase in future. It is likely that no water will be allowed to flow downstream like Wazirabad and Okhla barrage.
- With the construction of another barrage near Sikandara at Agra the river would be further segmented.
- The untreated effluents reach Yamuna River through the various storm water drains.
- The Yamuna River also receives industrial and domestic discharges from Faridabad, Paliwal, Kosi, Vrindavan and Mathura before reaching Agra.
- The flow in the river is mainly sewage except during monsoon.
- In Mathura, most of the drains are open and water logging is the main problem.
- There is no sewage treatment facility in Firozabad. There is no proper drainage system. No proper effluent treatment for 420 industries in Firozabad including glass and bangle industries.
- Vrindavan has no sewerage network and due to this water bodies and ground water pollution occurs.
- There is no proper sewage and drainage system in TTZ towns
- No details on wastewater management, domestic and industrial effluent management plan for the Fatehpur Sikri are available. Assessment of wastewater generation from this area is not available
- Lack of public participation and awareness

Proposed Schemes for Environmental Improvement in Agra is mentioned below in the table

S. No.	Projects Proposed	Cost (Rs. Crore)	Department
1	River Front Development Landscaping, Theme park, bio- diversity park, garden of five senses, musical fountain, activities for passive recreation, tree plantation along the banks of R. Yamuna in conformity with Land use plan 2021	45.65	ADA
2	Improvement and beautification of existing parks	54.83	ANN
3	Development of new parks	18.69	ADA
4	Protection of forest area / afforestation	16.95	Forest
5	Rain water harvesting in state government & ANN properties and select locations as identified by U.P. Jal Nigam	12.29	ADA/ ANN
6	Restoration and beautification of water bodies	33.26	ANN
7	Construction of weir across Yamuna downstream of Taj	73.10	Irrigation

List of Proposed Developmental Projects for the Agra City/TTZ Area

S.N.	Project Title	Project Cost	Project Proposed By
1.	Widening and Strengthening of MG	59.20 Cr.	P.W.D.
	Road in Agra City and Construction		
	of Central Verge 2011		
2.	Widening and Strengthening of major Roads of Agra City	66.98 Cr.	Agra Nagar Nigam

3.	Construction of Flyover/Bridge over Railway line at Idgaah-Bayana Rail Section (connecting NH2 & NH3 on Runakta-Rohata Road – Southern bypass), 2011	51.35 Cr.	U.P. State Bridge Corporation Limited
4.	06 Construction of Flyover/Bridge over Railway line at Agra Fort-Achhnera Rail Section (connecting NH2 & NH3 on Runakta-Rohata Road — Southern bypass), 2011	50.07 Cr.	U.P. State Bridge Corporation Limited
5.	Environment Management Plan for Area under TTZ Scheme	186.71 Cr.	Social Forestry Division, Agra
6.	Improvement and Beautification of Existing Parks in Agra, 2011	87.75 Cr.	Agra Nagar Nigam

Proposals

Environmental Management Plan (EMP)

- Being a heritage city and in view of the large floating population adequate sanitary facility / public toilets, with local treatment, at strategic locations in the city is essential
- Proper water supply and sanitation facilities for the urban poor
- Regulation on encroachments and construction of permanent structures on these drains at a number of places has been noticed.
- In-situ wastewater treatment employing bio- / phyto-remediation in large drains like Mantola drain and develop the area as entertainment parks, needs to evaluated through pilot scale studies

Environmental Improvement Action

- The activities along the river should be restricted. The polluting activities like disposal of sewage, dumping of garbage along the riverbank should be prevented in the river. The strict norms should be enforced.
- Public awareness needs to be done for action against activities related to the pollution of the river.
- The minimum flow of the river should be maintained for reducing the pollution levels.
- The maintenance and revitalization factors should be suggested for preservation and conservation of water bodies in the city.
- The water bodies can also be developed as tourist spots.
- Out of the total of 41 water bodies (covering 0.45 km2 area), 13 water bodies, like Guru ka Talao, Tota ka Talao, etc. To name a few, have been completely dried and land reclaimed for developmental activity. The Palwal Park and Sardar Patel parks also have water bodies located inside, which should be preserved and developed.
- Development of the green belt along the open drains.

Preservation and Conservation of Water Bodies and Development of New Parks

• The maintenance and revitalization factors should be suggested for preservation and conservation of water bodies in the city.

 Out of the total of 41 water bodies (covering 0.45 km2 area), 13 water bodies, like Guru kaTalao, TotakaTalao, etc. have been completely dried and land reclaimed for developmental activity. The Palwal Park and Sardar Patel parks also have water bodies located inside, which should be preserved and developed.

Other recommendations

- Public transport system should be encouraged, by providing efficient and convenient transport facility
- De-congestion in highly congested areas like commercial/tourist places needs to be made by construction of flyovers, foot-over bridges, multi-level parking facility etc.
- Awareness through display of pollution data
- Green belt development/Massive Plantation
- There is a need for green belt development around the disposal facility of the proposed industrial estates.
- Sustainable eco-tourism should also be kept in mind while developing the green belt/plantation in the region.
- It has been observed that large number of dairy and peta units operate within a range of 5 km from Taj Mahal area. It has been found that these industries do not have proper effluent management systems. It should be ensured that these industries set up workable treatment facilities or relocate to an area identified for the purpose.
- Public participation is must for the overall and sustainable development of any city.
- A huge gap always remains between the expectations and the facilities available. Therefore, public participation at ward/area level may help in minimizing this gap for the overall development of the region.
- Shifting of industries in Agra Dairies, petha, Tannery, electroplating and leather
- Establishment of new industrial estate at Firozabad
- All developmental planning in TTZ areas should be in coherence with the Master Plan of the concerned area and EMP (Environmental Management Plan)

Remarks

The plans does not provide an over-arching vision for TTZ. The proposals are more point based than systemic in nature. The document identifies the issues related to relocation of industries in the assessment section but later proposes to relocate petha, dairies, tannery, electroplating and leather industries in Agra. A detailed institutional structure Administrative Mechanism for Effective and Efficient Functioning of TTZ Authority is proposed at the end of the report. The report provides a detailed list of status and suggested action plans for different sectors/activities leading to minimization/reduction pollution and environmental upgradation for each TTZ towns, but a cohesive understanding and recommendations to tackle the issues is missing.

The report highlights the importance of public awareness and public consultation in each of its recommendation sections. Promotion of public transport and pedestrian infrastructure in terms of movement is also suggested. An overarching policy of creating green belts in the TTZ town is evident. It also suggests that all developmental planning in TTZ areas should be in coherence with the Master Plan of the concerned area and EMP (Environmental Management Plan).

6.2.6 Supreme court judgement: Date of Judgment 30/12/1996

Following are the key references

- 1. Varadharajan Committee made, among others, recommended that studies should be undertaken by competent agencies to explore the possibility of protecting the monuments by measures such as provision of a green belt around Agra in the region between Mathura and Agra.
- 2. The sources of pollution in Agra region as per the report of Central Pollution Control Board are iron foundries, Ferro-alloyed industries, rubber processing, lime processing, engineering, chemical industry, brick refractory and vehicles.
- 3. The Ministry of Environment and Forests (MEF), retained the National Environmental Engineering Research Institute (NEERI) in December 1992 to redefine the Taj Trapezium.
- 4. The other notable recommendation is the setting up of the Green Belt Development Plan around The Taj to save it from the effect of pollution. Under the Directions of this Court, the green belt as suggested by NEERI is already in the process of being planted/grown around the Taj.
- 5. The NEERI submitted a Technical Report summarising the following

 The various issues raised in this report pertaining to the fuel supply alternative to the industries in Agra-Firozabad region and the Mathura Refinery, can be summarised as:
 - Need for relocation of industries.
 - Availability of cleaner fuel (present and future industry)
 - Environmental benefits from alternate fuels and Safety considerations

The recommendations are summarized hereunder

- Shifting of small-scale polluting industries outside the Taj Trapezium on industrial estate sites to be identified by the Government of Uttar Pradesh;
- Provision of natural gas to the industries in Agra-Mathura region and Mathura Refinery"
- 6. The court is in the view that the shifting of the industries from Taj Trapezium has to be made in a phased manner.

Following are the judgements

- The development of industry is essential for the economy of the country, but at the same time
 the environment and the eco-systems have to be protected. The pollution created as a
 consequence of development must commensurate with the carrying capacity of our ecosystems. List of polluting foundries and industries is attached and are noticed to be relocated
 outside TTZ.
- 2. The "Polluter Pays" principle as interpreted by this court means that the absolute liability for harm to the environment extends not only to compensate the victims of pollution but also the cost of restoring the environmental degradation. The precautionary principle and the polluter pays principle have been accepted as part of the law of the land. The mentioned 292 industries shall as per the schedule indicated hereunder change-over to the natural gas as an industrial-fuel. The workmen employed in these industries are entitled to the rights such as Continuity of employment in relocated town, full wages during relocation, one year wage as shifting bonus, gratuity amount etc.
- 3. Other issues which are under consideration to control air pollution in TTZ are (no details are mentioned in this document)
 - Construction of 24 Kms of bypass road,

- Construction of Gokul and Agra barrage to supply drinking water to the residents of Agra and to bring life into river Yamuna which is next to the Taj,
- Green belt as recommended by NEERI has been set up around Taj, Directions have been issued to the Government of India to decide the issue,
- Pertaining to declaration of Agra as heritage city within two months, June 1997.

Annexure 6.3: Projects envisaged by various agencies

6.3.1 TTZ/ Braj Region World Bank Projects – Key Components

Construction of Banke Bihari Temple Area, Vrindavan Male and Female toilets Toilets for drivers with separate access Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Open courtyard Multipurpose store room Guard room Provision for water ATMs. Redevelopment of Daruk Parking Male and Female toilets Toilets for drivers with separate access Inquiry counter and an information centre Administration and management room Toilets for drivers with separate access Toilets for drivers with separate access Toilets for differently abled persons Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Otal Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings Urban Design Guidelines for Parikarma Marg	List of projects	Project Components
Rehabilitation of Banke Temple Area, Vrindavan • Male and Female toilets • Toilets for drivers with separate access • Inquiry counter and an information centre • Administration and management room • Locker Room • Shoe Racks • Open courtyard • Multipurpose store room • Guard room • Provision for water ATMs Redevelopment of Daruk Parking • Male and Female toilets • Toilets for drivers with separate access • Toilets for drivers with separate access • Toilets for drivers with separate access • Toilets for differently abled persons • Inquiry counter and an information centre • Administration and management room • Locker Room • Shoe Racks • Multipurpose store room • Guard room • Courtyard with food kiosks • Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks • Total Length to be covered: 8.4 Kms • Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers • Total Length to be covered: 1.2 Kms • Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings		,
Temple Area, Vrindavan Toilets for drivers with separate access Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Open courtyard Multipurpose store room Guard room Provision for water ATMs Redevelopment of Daruk Parking Male and Female toilets Toilets for drivers with separate access Toilets for drivers with separate access Toilets for differently abled persons Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings		•
 Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Open courtyard Multipurpose store room Guard room Provision for water ATMs Redevelopment of Daruk Parking Male and Female toilets Toilets for drivers with separate access Toilets for differently abled persons Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		
Administration and management room Locker Room Shoe Racks Open courtyard Multipurpose store room Guard room Provision for water ATMs Redevelopment of Daruk Parking Male and Female toilets Toilets for drivers with separate access Toilets for drivers with separate access Toilets for drivers with separate access Toilets for differently abled persons Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Total Length to be cove		·
Locker Room Shoe Racks Open courtyard Multipurpose store room Guard room Provision for water ATMs Redevelopment of Daruk Parking Male and Female toilets Toilets for drivers with separate access Toilets for differently abled persons Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings		
 Open courtyard Multipurpose store room Guard room Provision for water ATMs Redevelopment of Daruk Parking Male and Female toilets Toilets for dirivers with separate access Toilets for differently abled persons Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings		
 Multipurpose store room Guard room Provision for water ATMs Redevelopment of Daruk Parking Male and Female toilets Toilets for differently abled persons Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tremixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings		Shoe Racks
 Multipurpose store room Guard room Provision for water ATMs Redevelopment of Daruk Parking Male and Female toilets Toilets for differently abled persons Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tremixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings		Open courtyard
Guard room Provision for water ATMs Redevelopment of Daruk Parking Male and Female toilets Toilets for drivers with separate access Toilets for differently abled persons Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings		
Redevelopment of Daruk Parking Male and Female toilets Toilets for drivers with separate access Toilets for differently abled persons Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings		
 Male and Female toilets Toilets for drivers with separate access Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		 Provision for water ATMs
 Toilets for drivers with separate access Toilets for differently abled persons Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		•
 Toilets for differently abled persons Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		
 Inquiry counter and an information centre Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		
 Administration and management room Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		
 Locker Room Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		
 Shoe Racks Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		
 Multipurpose store room Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		
 Guard room Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		
Courtyard with food kiosks Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings		
 Provision for water ATMs Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		
Treatment of Streets and Drains Leading to Banke Bihari ji A- Street Treatment Type 1: Rubber Moulded Paver Blocks		
A- Street Treatment Type 1: Rubber Moulded Paver Blocks		Provision for water ATMs
Blocks Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings		Treatment of Streets and Drains Leading to Banke Bihari ji
 Total Length to be covered: 8.4 Kms Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		
 Average width: between 3 to 6 mts width B- B- Street Treatment Type 2: Concrete Road with Tre mixing With Side Walks and Drain Covers- Total Length to be covered: 1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		
mixing With Side Walks and Drain Covers-		_
 Total Length to be covered :1.2 Kms Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings 		• •
O Average width: between 4.5 to 6 mts Development of Community Open Green Area Behind Banke Bihari Ji Temple Improvement Signage and Awnings		•
Bihari Ji Temple Improvement Signage and Awnings		_
Urban Design Guidelines for Parikarma Marg		Improvement Signage and Awnings
		Urban Design Guidelines for Parikarma Marg

Rehabilitation Of 09 Kunds In Braj	Entrance gate,
Region	Brick on edge paving for pathway (Length Approx. 450)
	rmt.)
	Storm Water Drainage (Length 224 rmt.)
	Cobble Stone Paving (391sqm)
	Edge wall repairing with removing and redoing
	plastering, with painting (663 sqm)
	Railing with edge wall (912 rmt)
	Cattle Pyau (Size 6.56m x 2.26m)
	 Drinking Water Pyau (1 No.)
	Rest shelters (Kunj) (1 No.)
	 Tyala (Seating Platforms around Tree) (16 Number)
	Toilet with Septic Tank (1 number of toilet block of
	following size (Size 11.45 x 6.85. Gents 2 WC,1
	Bathroom 5 Urinals, 2 wash Basins, 1 for Specially
	abled. Ladies 3 WC, 2 Bathrooms, 3 Wash Basins, 1
	Diaper changing station, 1 for especially abled.)
	Monitoring Room and caretakers room (1 Structure
	having two rooms Size 4.05 x 6.0 m)
	Jal Mahal external wall repairing with plaster and resinting (521 core)
	painting (521 sqm)
	Landscaping (Grassing area - 2328 sqm) Lighting and allostrification around the laund
	Lighting and electrification around the kundBio remediation & aeration
	 Repairing of Ghats (steps to approach water Body) around Kund (Length of Ghat 25rmt)
	Bore Well (1 No.)
Revitalization of Kachhpura And	Mehtab Bagh Visitor Parking Facilities
Mehtab Bagh Area,	Total area for parking is 5168.2 sqmt including
Wientab Bagiir ii ea,	area of 387 sqmt for landscaping.
	 Provision for 07 buses
	 Provision for 62 cars
	o Provision to park / dock bicycles: and 2
	wheelers
	 which includes 16 bicycle and 33 two wheelers
	 Utility block
The state of the s	 Total 35 Nos. of Street Lights are required for
	appropriate lighting in the parking area.
	 Approach road and side walk to Mehtab Bagh
	Paving of Pedestrian Access to Kachchpura Through
	Fields
	 Access route is 5 meter wide
	Rehabilitation of 4 Community Chowks
	 Urban Design Guidelines for façades, Street furniture,
	Signage and public spaces in the village and Kachhpura
	Village Walk Brochure
Report for Revitalization of	Traffic Calming of Amar Singh, Jalkaari Baai, Purani
Shahjahan Park Walk Way Between	Mandi Junction (Traffic Calming at Grade, Traffic Lights
Taj Mahal And Agra Fort	and Crossing at Main Junctions)
	 Entry Gates Access Organization and Hop On-Hop Off

	 Natural Path to Agra Fort (Total length: 158 m) Re Organisation of Circulation & Furniture on Pathway Development of Pedestrian and Perimeter Pathways Development of Natural Play, Lake, Forest and Meadows Loops Signage, Lighting and Street Furniture
Riverfront Connectivity, Interpretation and Basic Services Provision to Communities from Ram Bagh to Taj Mahal	
Visitor Centers in Vrindavan, Govardhan And Barsana	 Interpretation Facilities Braj Haat Centers for Living Traditions
Construction of work for Visitor Center and Parking Rehabilitation at Taj Mahal West Gate, Agra (3.75 acre) Construction of Sewerage Treatment	 Car parking Visitor facility center Rehabilitation of Community Shops & Vendors Vehicular Management
Plant at Kachhpura Construction of Braj Haat/Canter for Living Traditions Building Upgradation of Food Craft	 Interpretation Facilities Braj Haat Centers for Living Traditions
Institute	
Transportation and Communication Equipments for Tourist Police (visitor safety)	
Interpretative Signage, exhibition Design and supervision of Production and installation of all artifacts	

6.3.2 Agra Smart City

6.3.2.1 Smart City Themes

Theme#1: Reconnecting Taj Mahal and Agra Fort

- Development of tourist walkway between Taj Mahal and Agra fort
- Creation of a visitor centre and provision of well-equipped e-battery cars mobile vans for publicity and assistance to tourists.
- Development of livelihood activities in the proposed route

Theme#2: Integrated development of Tajganj area

- Rebuilding livelihoods and upgrading 22 slums along with improved infrastructure.
- Provision of solar roof top for rehabilitated houses
- Improvement of the vicinity of lesser known heritage monuments such as Diwanji-kamaqbara and Kali Masjid
- Development of Mughal Museum and Taj Orientation centre

- Building resilient infrastructure: 24x7 water supply in the pilot zone,100% underground drainage system, creation of 100% waste management Tajganj ward, 100% coverage of closed storm water drainage, construction of 285 individual and upgradation of 5 community toilets, conversion of cremation ground into electric-crematorium, 18 kms. of underground cabling duct, one state-of-art fire station, 11 rain-water harvesting tanks of 14.98 lakhs capacity each, smart grid and metering
- Provision of tourist and mobility facilities: 100 wi-fi spots, smart signages at various locations, 25 tourist kiosks ,3 km. of heritage trails, 120 public e-toilets, 125 km. of pedestrian walkways, 40 e-rickshaws, and 25 km of cycle tracks. Soft components such as organizing Taj Mahotsav, hot air ballooning festival, evening cultural shows at Agra Fort, drafting of urban design guidelines for development in the vicinity and façade improvement viz- painting white colour to buildings and adaptive re-use of 49 traditional heritage built structures.
- Revitalization of green spaces: Upgradation of Shahjahan park, organizing Taj nature walk, development of Taj park, scaling up of "My Tree" project for development of heterogenous forest and plantation on 20km of road.
- Sustainable livelihood development: Construction of three skill development centres and development of streets for showcasing stone inlay, zardosi, flower markets etc. which would aid preservation of urban morphology. Designing of one night bazaar and a digital literacy centre.
- Social Infrastructure and Safety/Security: Conversion of 2350 streetlights to LED, construction of one Quick response centre for incident management, Development of Women Distress centre-"SHE" centre, installation of CCTVs at important location, construction of five smart police kiosk, upgradation of two Municipal Schools and college

Theme#3: Enhancing connectivity to Taj Mahal through Fatehabad road

• Street-scaping and beautification from Mall road to Inner ring road- 6.5 kms stretch of Fatehabad road.

6.3.2.2 Smart City - Smart Urban Form

Taj Improvement District (TID) would be revived and redefined by the following urban forms:

- Re-defining the urban morphology: Urban design guidelines would be drafted to regulate the development in the TID. Elements such as preservation of tangible and intangible heritage, renewal of public realm spaces such as markets and vending zones, adaptive reuse of private heritage buildings and other spaces such as turning of
 - nine-pillared house into a tea-terrace will transform the place.
- Seamless connectivity: 25 km of cycle trail and 125 km of footpath would ensure continuous connectivity between Agra Fort and Taj Mahal. Tourist kiosks, e-rickshaws, and 3 heritage trails through lesser known monuments will be planned in the TID zone.
- Rejuvenation of green public spaces: TID has 248 acres of green space. Existing
 parks such as the Shahjahan park, and the Taj nature walk will be redesigned to be
 harmonious with the proposed development of TID. The project "My Tree"donating/planting a tree in the name of beloved ones, would be revived to accentuate

walkways through roadside plantation.

Dense neighbourhood: TID is a densely populated area with more than 22 bastis and

Katras. There are 3345 households in these sttlements with a population of 22,746. The proposed project of in-situ upgradation of 50 houses and construction of 254 affordable houses in TID would ensure optimum densification of the area with better access to basic infrastructure.

- Walkability: TID is characterized by intricate pattern of narrow lanes which are more amenable to non-motorised transport. All the major roads would be designed to have footpaths and walkways. The bylanes would be paved with cobbled stones to enhance walking experience.
- Revival of Heritage and facilities to promote tourism: facade improvement of roughly 500 houses and buildings will help in attracting tourists. Other tourist facilities such as

the Mughal Museum, Taj Orientation Center and International Cafe street will create avenues for tourists to see and understand the local history, culture and art. These tourist facilities will have a total car parking capacity of 300 to ensure congestion free roads.

• Development of multi-skill development centers: 5 multi-skill development centers to promote traditional knowledge of Zardosi and stone in-lay work will be set up.

6.3.3 HRIDAY Schemes – Mathura & Vridavan

List of projects	Project Components	Cost
Development of Vrindawan Parikrama Marg.		10.56 Cr
Krishna Janmabhoomi Precinct		13.02 Cr

Revitalization of the Historic Chatta Bazaar at Mathura	6.15 Cr
Rejuvenation of the Historic Vishram Ghat at Mathura	3.62 Cr

Annexure of Chapter 7

Annexure 7.1 – Strategies and Recommendations for Urban Planning

7.1.1. Strategies and Recommendations at the Regional Level:

SI. No.	senss	Strategies	Recommendations
-	Defining growth trajectories and functional	tional base	
_	Cities in the region are a result of unplanned urban growth except for Bharatpur.	- Preparation of Master Plan of all cities in the TTZ region	 Regional Plan for the entire TTZ to be prepared Master Plan along with development plan for the municipal corporation boundary and the planning boundary for all class I, II and III cities and towns in TTZ to be prepared.
=	The growth directions are determined either along the expressways or the river.	- Growth directions to be determined as per Master Plan and Regional Plan requirements	- All Master Plans to be integrated at the Regional level along with all other sectoral plans like transportation, infrastructure, MSME schemes, etc. to avoid haphazard growth
=	New land use plans coming up along expressways with proposals of industries	- New land use plans being approved in the TTZ region needs intervention and monitoring	- The land use plans to be integrated in the Regional development plan following rules and regulations bestowed on the region by the supreme court under TTZ impact and the Government of Uttar Pradesh and Rajasthan
7	Restoring the balance between environment and development	nment and development	
≔	Stone Quarries are present and extensive mining is practised. The wind direction determines the presence of air pollution in the region	 Strategies to stop stone quarries and sand mining in and around the region Use of buffers as plantation to be made compulsory in any mining, quarrying or reclaimed areas. 	The Regional Development Plan to have recommendation and guidelines for hazardous activities not only within the TTZ region but also beyond it.

S.	Issues	Strategies	Recommendations
Š.			
<u>></u>	Brick Kilns in the entire region are other sources of pollution	- Mud – made brick kilns to be converted to biodegradable wastes and alternate use of coal needs to be found.	Vertical Shaft Brick Kiln technology, developed in China, that is an energyefficient, environment friendly and economically-viable means to produce
>	Agricultural Crop burning is also practiced in the region.	- Agriculture crop burning to be stopped and alternate uses to be identified for them as fodders, fences, etc.	techniques like projects introduced in Punjab. This prevents air-pollution, preserves nutrition in soil, and uses straws to be used as bio-mass fuel and other uses. Uttar Pradesh Government can raise money for this from the Green Climate Fund board
ა.	Regional equity and networking of econom	onomic opportunities	
_	The industries in the TTZ are of small and medium scale with most of them polluting and operating in the Firozabad area.	Closer of polluting industries in the region and promotion with incentives in alternative industries as per availability of raw materials. Strategy to make the TTZ, a region that values innovative and creative industries, invests in small-scale entrepreneurialism, and places an emphasis on education, arts and culture.	 Ministry of Environment and Forests, Government of India declared Agra-Mathura region as Air Pollution Protected Area, namely the Taj Trapezium Zone in the year 1983 and prohibited establishment/expansion of polluting industries. Hon'ble Supreme Court Orders (Air Pollution Control) on shifting and closure of identified/listed polluting industries in the TTZ to be strictly followed and implemented. This activity needs to be monitored by a Central Government Special Committee to be designated for the activity and submitted to CPCB and Supreme Court.

S. No.	Issues	Strategies	Recommendations
			The recommendations made by NEERI in its study in 2013 can be followed in this
		•	However, the new categorisation of
			industries released by the Ministry of
			Environment, Forest and Climate Change
			on 5 th March 2016 needs to be followed for
			this activity.
			Unregistered industries should be
			cancelled and removed with immediate
			effect.
			Alternative innovative and creative
		< >	industries like has been identified under the
			"Mapping and Assessment of Creative
			Industries" Report by UP Tourism in
			March, 2018 needs to be promoted.
			Investments in small-scale
			entrepreneurialism by the UP Government
			has to be encouraged.
			Skill building Institutions to be opened in
			this respect.
:=	New Industries are coming up along	s for exp	The recommendations are same for the
	the expressways that are polluting in	activities and strategies for shifting	new and upcoming industries in the TTZ as
	nature as well. For eg. Kosi Kalan,	Industrial areas towards expressway or	for old industries.
	Chatta and Nandgaon areas	beyond TTZ.	The same committee can come up with
		- Evolve planning norms and development	recommendations and approvals for
		control guidelines along expressways in	these new industries.
		vicinity of urban areas.	Planning Norms and Guidelines
		•	THE INDUSTRIES (DEVELOPMENT AND
			REGULATION) ACT AMENDED, 2016
		•	CPCB Rules and Regulations
		•	URDPFI Guidelines 2014 for providing
			infrastructural services to industries

S	Issues	Strategies	Recommendations
9			
			 The Land Act 2013
≔	Increasing number of tourists and	- Strategies to manage a certain percentage	=
	pilgrims has stressed the carrying	of tourists at one point of time in a city.	ings by focusing
	capacity of the cities in the region.	- Redistribution of the tourists to the entire	development of new "urban
		region by creating more tourism hubs all	destinations" in the TTZ region by adding
		around the region.	
			needs to be identified by the Tourism
			department in Uttar Pradesh.
			- To create new circuits within the region with
			more destinations and interests.
			- New Tourism Policy of the State should
			address this item with immediate effect.
	Unidentified and unprotected tourist	- Strategies to creation of new, exciting	- To identify and enlist important heritage
	spots in Deeg, Nandgaon, Chhata, etc.	attractions: places that are attractive for	driven tourist spots as has been identified
	needs to be identified with tourist	both guests and locals due to their	by the Heritage Conservation team in this
	infrastructure and connectivity.	architecture, public space design, cultural	Vision Document.
		highlights, etc.	- To provide immediate identity and
		 Addition of existing, functioning and lively 	protection to these spots and sights
		neighbourhoods outside the city centre to	- To prepare Tourism Driven Plan for all the
		the "tourist map" of Agra	sites with tourism accommodation and
			infrastructure facilities.
4.	Assessing and incorporating future in	Assessing and incorporating future infrastructure (physical and social) needs	
_	Sources of Water and Quality of Water	- Strategies to prepare basic infrastructural	- Agra irrigation canal to provide water for
	are a huge concern for the region.	plan for all the cities, towns and villages is	the region for drinking purpose as well.
		required	- Construction of an alternative canal in the
		- Strategies to install Water Treatment	region for water supply to be investigated,
		Plants at suitable locations	planned and implemented
		 Strategies to operationalise and use, old 	- Adoption of decentralised systems in big
		and new rainwater harvesting systems in	cities like Agra, Mathura-Vrindavan, etc.
		the region should be made mandatory	- Preparation of Mater Plan for Drinking
		 Extraction of ground water to be stop with 	Water Supply for all cities in TTZ and
		implementation of other plans	installation of WTPs.

<u></u>	Issues	Strategies	Recommendations
Š.			
			 To encourage alternative sources of water
			supply like rainwater harvesting and grey
			water reuse system to become mandatory
			for the entire TTZ.
			- Extraction of ground water to be completely
			stopped for a short term period until the
			level of ground water rises.
			- Policies and Guidelines:
			National Sustainable Habitat Standards for
			the Urban Water Supply and Sewerage
			sector
			National Service Level Benchmarks
		< >	CPHEEO Manual on Water Supply and
			Treatment 2015
			Guidelines on Urban Reforms Incentive
			Fund
			Manual on Water Supply and Treatment
			Systems (CPHEEO-1999) 2016
			Manual on Operation & Maintenance of
			Water Supply System (2005) 2016
	No proper Sewerage system and	- Strategies to prepare basic Sewerage and	- Preparation of City Sanitation Plan for all
	drainage system in any city in the TTZ	Drainage infrastructural plan for all the	cities in the region and implemented with
		cities, towns and villages	immediate effect.
		 Strategies to Use Grey water for alternative 	- New generation of sewage treatment
		uses in the domestic and industrial sectors	s such as membr
		 Strategies to set up Sewerage Treatment 	bioreactor (MBR) can treat the
		Plants at suitable locations	wastewater almost to the quality of river
		- Strategies to stop releasing sewerage	water. These technologies can be used for
		water in the rivers and canals	the new STPs that will be installed in cities.
			- In Class I cities, oxidation pond or
			activated sludge process is the most
			commonly employed technology for
			wastewater treatment, covering 59.5

	Issues	Strategies	Recommendations
			percent of total installed capacity. This is followed by UASB technology, covering 26 percent of total installed capacity. A series of Waste Stabilization
			Ponds technology is also employed in 28 percent of the plants, though its
			combined capacity is only 5.6 percent.
			Decentralised systems with grey water
		2	reuse needs to be initiated in the cities. The rest of the treated water can be used
			in agriculture
			Release of sewerage and drainage water
		< >	in rivers has to be stopped with immediate
			effect
			National Sustainable Habitat Standards for
			the Urban Water Supply and Sewerage
			sector
		2	National Sustainable Habitat Parameters
			on Urban Storm Water Management
			National Service Level Benchmarks
			CHEEPO MANUAL ON SEWERAGE AND SEWAGE TREATMENT 2012
			Manual on Sewerage and Sewage
			nt Systems (2013)
			Advisory Note on Recent Trends in
			Technologies in Sewerage System (March, 2012)
	Electricity Supply and alternatives	Corporates can be invited from other states	CESE Company in Kolkata or any other
_	being used in industries and residential	who can supply electricity in the region like	to be designated to supply electricity to the
10	areas are reasons for pollution and fire	the CESE Company in Kolkata, who is also	region.
— [hazards in the region	serving in the state of Rajasthan.	

<u>n</u> 5	Issues	Strategies	Recommendations
		- Use of solar panels and other energy sources should be made mandatory with	- Solar panels and energy to be used as an alternative and should be mandatory in
		incentives.	every city with incentives
		- Bio-gas or natural gas can be other	- The Solar Study prepared can be referred
		alternatives	for this activity
			- Folicy and Guidelines:
			 National Sustainable Habitat parameters for energy efficiency in Residential and
			Commercial Buildings 2011
			 Jawaharlal Nehru National Solar Mission
			Guidelines for Development of Solar Parks,
			Ministry of New & Renewable Energy, 2016
		<	 Guidelines for Grid-connected Small Scale
			(Rooftop) Solar PV Systems for Tamil
			Nadu, 2014
≔	Solid Waste and C&D waste are mostly	- Strategies for a proper SWM Plan is	- City Sanitation Plan to be prepared for all
	dumped outside the cities along the	mandatory for all cities, towns and villages	cities in the region having strategies to
	highways. Open incineration is also	in the region	adopt bio-degradable waste and
	practised.	- Strategies should be based on a zero	alternative use.
		waste management system	 Promoting zero waste
		 The bio-degradable wastes can be used as 	 Promoting Monitoring Projects like the
		fertilisers for the agricultural lands, as	PAS Project in Gujrat and Maharashtra
		bricks for the newly constructed	- Policies and Guidelines:
		development and removing the brick kilns,	 Manual On Solid Waste Management
		etc.	Systems CPHEEO 2000
			MUNICIPAL SOLID WAS
			TEMANAGEMENT MANUAL Part III: The
			Compendium 2018
			 National Sustainable Habitat Standards for
			the Municipal Solid Waste Management
			City Sanitation Plan under National Urban
			Sanitation Policy 2016

<u></u> S	Issues	Strategies	Recommendations
			 Waste Management Rules 2016 TOOLKIT FOR IMPLEMENTATION OF SOLID WASTE MANAGEMENT RULES, 2016 National Service Level Benchmark
5.	Redefining the role of the river		
_	River Yamuna carrying all pollutants from Delhi and downstream is clogging and drying the river.	Pejuvenation, reclamation and restoration projects to be taken up for River Yamuna for the entire stretch from Delhi till Allahabad. Re-look should be made on the importance and requirement of the barrages that has been constructed and are being planned to be constructed all across the river stretch. All sewerage and drainage points opening to the river should be mandatorily stopped and alternative plans like reuse of grey and black water should be taken up.	The Government of Uttar Pradesh is in the process of developing a dynamic vision to rejuvenate the State's water resources including the Ganga river basin and its tributaries in the interest of farmers, industry, households and other water users. Under this scheme Restoration and Conservation of River Yamuna project to be taken up. The Final Report on Restoration and Conservation of River Yamuna Submitted to the National Green Tribunal 2013 needs to be initiated and implemented with immediate effect. Pioneering projects in Riverfront Development project of Ahmedabad city which was designed based on riverfronts of Thames in London and Seine in Paris. Diverting sewerage and drainage channels from entering the river. Penalty to be implemented to the Urban Local Body in laps of this process. The UP Irrigation & Water Resources

S. No.	Issues	Strategies	Recommendations
			coordinating these different work streams
			Policies and Guidelines:
		4	 All guidelines of the Ministry of Water
			Resources, River Development and
			Ganga Rejuvenation
			 Guidelines for National Lake
			Conservation Plan 2018
ļ!	Barrages formed at the end of the cities		- Lately, dams are seen more as hydropower
	holds the water along the city but		generators with flood mitigation, irrigation
	carries only sewerage water beyond		and drinking water supply only being
	the city jurisdiction converting it more		additional benefits. The same stand for the
	into a nallah.	<	dams in the Yamuna region found in the
			TTZ. Therefore there is a need to monitor
			the proposals and the existing dams
			currently present in the Yamuna river in
			the region and assess their technical
			need and requirement and therefore
			implement the same.

• •
⊆
Œ
2
<u> </u>
0
⊆
Ξ
>
<u>е</u>
ā
ë
ע a_l
thura \
hura \
ıthura \
/athura /

<u>.</u> 5	Issues	Strategies	Recommendations
	Defining growth trajectories and functional base	ctional base	
_	Areas adjacent to the Market centre and old settlements exhibit dense development due to cluster housing. This is because of availability of all services, cultural and religious attractions and work places. This	Strategies to regulate all commercial and service centres on the main streets and lanes of the city and free the entire core city for movement of tourist and religious activities. - Regularisation of informal commercial areas. Identification and control measures to be adopted for areas exhibiting mixed land use.	Regularisation of informal commercial areas. Identification and control measures to be adopted for areas exhibiting mixed land use. No new development except for

<u>S</u>	Issues	Strategies	Recommendations
Š Š			
	area is under development pressure		old and closed constructions should be
	due to lack of organized growth.		allowed.
			- This should be applicable near Chhata
			Janam Bh
			area, Vishram Ghat Area and Shiv
			Ganga Taal Area
:=	The land allocated for open spaces	 Strategies to re-densify the core areas. 	- Land demarcated for parks and
	is also being consumed by	 Kunds and water bodies can be cleaned and 	recreational purpose in the Master Plan
	residential development or	used as recreational spaces.	of 2023 needs to be converted for the
	commercial, thus resulting in non –		same use.
	conforming land use.		- Land available from old dilapidated
			structures and sick industrial areas can
		< >	also be used for open spaces and
			recreational green areas.
≔	There is new extensive planned	- Strategies to control extensive development	- URDPFI Guidelines of 2014 to be strictly
	development happening within	needs to be looked at.	followed for allocation of land under Semi-
	Vrindavan MC boundaries and the	 Development should be as per the demand 	Public and Public Sectors.
	fringe areas.	and requirement of the city based on	- Development controls to be applied on
		calculations taken up in the Master Plan.	private developers and mixed use
		- Strategies to allow Private developers	
		developing religious temples and ashrams to	
		be relooked at because this may harm the	
		religious values & importance of the old	
-	:	ples.	
>	Since the core city and the religious	- Strategies to propose a heritage	- Formulation of Heritage Development
	temples are located along the river,	development plan in and around all neritage	Flan in sync with the Master Plan of the
	there is a lot of pressure on housing	sites along with renewal and redevelopment	
	and infrastructure in the older parts	components attached to the plan.	- Renewal and restoration plans and
	of Mathura and Vrindavan. There	- No new development to be allowed in the	projects can be adopted.
	are many old, unused dilapidated	core area	
	structures that can be found in this	 Re-densification schemes to be adopted 	
	part of the city.		

, , -=	Fabric dyeing is one of the major	Strategies Using Green Technologies in order to	Recommendations - Environment Impact Assessment study
Indust Dye a indust	Industrial contributors to the region. Dye and colour manufacturing industries are sources of pollution.	sustain such industries, ir possible.	Industries need to follow the guidelines mentioned in Environment Protection Act of 1986 and also follow the norms of 'Pollution Control Board'. Natural organic colours can be used in place of artificial synthetic colours
The printicurion curion to bu Thes city p	The inner city also has several printing presses whereas metal curios and sari printing are subject to bulk orders from other states. These activities largely cause inner city pollution.	Incentives could be provided for shifting these to identified industrial estates.	 Proper management of printing press to be maintained according to the environmental rules. Use of Ethylbenzene to clean printing machines Unregistered Printing press can be relocated to industrial estates outside the city in the southern half.
822.9 for o plan. refin othel come	822.92 Ha. Of land area is allotted for oil refineries as per the Master plan. So apart from the existing oil refinery, there is still possibility of other polluting refinery industries to come up in the southern part of the city of Mathura.	Household and small industries can be established in the proposed area. Commercial space could be provided. Trees to be planted to provide a buffer between the Industrial and residential zone.	 Strict order to stop more oil refineries to come up in Southern Mathura. Green buffer of 200mts. around Mathura Refinery Long term measures to be taken by Mathura refinery for environment sustainability with respect to air, water and waste management Encourage medium and small scale non-polluting industries to come up in the land still available for development. Policies and Guidelines: Technical EIA Guidance Manual for Petroleum Refining Industries, MoE&F to be followed The Environmental, Health, and Safety (EHS) Guidelines, 2016 to be followed.

SI. No.	Issues	Strategies	Recommendations
	Non - availability of uninterrupted power supply at lower rate, lack of	State Industrial Policy to be formulated and implemented.	- CESE Company in Kolkata or any other to be designated to supply electricity to the
	upgraded technology and poor	Promote hygienic and adopt modern	region.
	infrastructure.	technology along with incentives in	- Solar panels and energy to be used as an
		developing the industry.	alternative and should be mandatory in
		Better Technology Up-gradation Scheme	every city with incentives
	<i></i>	with tracking mechanism.	 The Solar Study prepared can be referred for this activity
	Ghats are not cleaned or maintained	Strategies for regular cleaning and waste	- Ghat maintenance can be done by a
	properly and haphazard new	management along the Ghats.	separate body like a SPV or on PPP mode
	development is coming up all along -	Strict regulation on waste disposal and	like is being done in Varanasi, Uttar
	the Ghats. The water quality is	development strategies at the riverfront.	Pradesh
	deteriorating at both upstream and -	Some zones should be made non accessible	 No new development to be allowed in this
	downstream locations.	to the public.	area except for old dilapidated structures.
			- Cleaning of river water to be prioritized
			by use of technology and political will
	Commercial activities are not well -	Planning for redistribution of commercial	- Decentralisation scheme for commercial
	distributed along the city.	centres all over the city as per requirement	areas.
		and demand should be prepared.	- No new commercial development in the
			core city area.
	ale trading	Strategies to relocate wholesale trading	- Land to be allocated along the outer ring
	located within the city creating	centers to avoid congestion	road for Mandis and wholesale markets
	congestion and unhygienic situation		to be relocated from the city centre to the
			- The land released can be used for
			heritage handicraft markets and
			recreational areas.
	Mixed used activities have emerged in the inner city with shore on the	Planned mixed used development should be proposed in the master plan to avoid	- Identification and control measures to be
		וומפוכו לוומיו	מכת וכו מוכת
	ground floor and residence on upper floors.	encroachments.	use.
	Major issues in tourism are lack of safety and security of tourists.	Strategies to Plan for tourist infrastructure in the entire city to be taken up.	 Tourism Infrastructure Plan to be prepared.
	dated and ecoding of todated,		

<u>છ</u> ે :	Issues	Strategies	Recommendations
Q			
	Underdeveloped Public transport system.	 Dedicated buses and e-rickshaws to cover tourist destinations. 	
	Most of the heritage, religious and	- Identification of all heritage buildings to be	- Conservation and revival measures of the
	kunds are not protected under the	done with the help of ASI.	prominent temples is also required.
	state or ASI.		Tourism Policy to be formulated.
			 BKAJ circuit should be promoted.
	Poor health, lack of hygiene and	- Provision of public toilets, signage, and	
	proper sanitation among common	water supply in the heritage and religious	for norms and regulation on providing
	people especially in the rural parts	buildings to be provided.	racilities of tourist infrastructure
	of the Mathura pose a big Issue for development.	 Proper waste monitoring and collection to be done from tourist locations. 	 Proper implementation and management of services through strict autonomous
	-		monitoring systems to be adopted by the
	The number of E star and 1 star hotel	More commontion and blunds and to	HDDDEL Guidelines of 2011 to be etricated
	accommodation is not sufficient in	cater to all classes of tourist population.	followed for allocation of land under tourist
	number.		accommodation facilities.
			- Development controls to be applied on
			private developers and mixed use
	Areas adjacent to the Market centre	- Strategies to re-locate all commercial and	- Regularisation of informal commercial
	and old settlements exhibit dense	service centres to the main streets of the city	areas.
	development due to cluster housing.	and free the entire core city for movement of	- Identification and control measures to be
	This is because of availability of all	rist and reli	adopted for areas exhibiting mixed land
	services, cultural and religious	- No new development except for	nse.
	attractions and work places. This	redevelopment proposals on dilapidated, old	
	area is under development pressure	and closed constructions should be allowed.	<
	due to lach of organized growin.		
8	Multi-nodal urban structure and public places and movement patterns	lic places and movement patterns	
_	Affordable housing provisions	- Strategies to move people in the affordable	- Mixed use areas to be notified and
	coming up in both Mathura and	housing project areas needs to be adopted.	regularised.
	Vrindavan MCs on the outskirts of	- There in-situ development projects rather	- Provision of new commercial areas with
	the city but mostly the houses are	than just relocation projects.	proper parking spaces and infrastructure
	vacalit of empty.		lacilities.

<u></u> S	Issues	Strategies	Recommendations
	9% of the city population lives in slums. The slums have poor sanitary conditions due to clogged drains, poor quality of water supply and the collection of household wastewater in open pits. Slums also lack toilet facility, which results in open defecation. The residential areas exhibit non-	Strategies to Plan for slum Development with provision of infrastructure facilities. Proper access, congestion free and hygienic conditions to be provided to the areas with slums.	 Slum development plan to be prepared with emphasis on education and skill development. Policies and Guidelines: PPP Models for Affordable Housing 2017 Report on Migration 2017 Guidelines for Slum-free City Planning under RAY Mixed use areas to be notified and
C	conforming commercial and mixed- use development along the major market areas along the road. The open and green spaces are being encroached upon by residential or commercial activities.	provide new commercial centres. Recreational spaces need to be proposed and developed, with buffer from commercial areas.	regularised. Provision of new commercial areas proper parking spaces and infrastruc facilities.
က	Redefining the role of the river		
_	Deteriorating Water quality of the river at both upstream and downstream locations. Construction of barrage holds the untreated water in front of the Ghats that has a bad odour and is polluted.	Strategies to develop a WTP at the upstream end of the river needs to be looked at. The downstream WTP site can be redeveloped as an STP. There should be other locations for developing STPs as per requirement. Construction of the barrage should be relooked and dismantled with immediate effect.	 Rejuvenation and Conservation of River Yamuna as a project to be taken up. The Final Report on Restoration and Conservation of River Yamuna Submitted to the National Green Tribunal 2013 needs to be initiated and implemented with immediate effect. Pioneering projects in Riverfront Development may be taken up as the Sabarmati Riverfront Development project of Ahmedabad city which was designed based on riverfronts of Thames in London and Seine in Paris. Diverting sewerage and drainage channels from entering the river. Penalty

SI. No.	Issues	Strategies	Recommendations
			to be implemented to the Urban Local Body in laps of this process. The UP Irrigation & Water Resources Department is the nodal agency coordinating these different work streams to rehabilitate rivers to initiate the process. Policies and Guidelines: All guidelines of the Ministry of Water Resources, River Development and Ganga Rejuvenation Guidelines for National Lake Conservation Plan 2018
4	Assessing and incorporating future infrast	infrastructure (physical and social) needs	
_	The current water supply is not sufficient to fulfil the demand of the existing population. Ground water is a dependable source of water supply in the city. This has resulted in tremendous decrease in ground water levels in past few years.	Adequate pipe line network for water supply and pumping system is to be provided. New feeder mains shall also be provided.	 Water Management Plan has to be Prepared. Rain Water Harvesting at Household level and ward level to be introduced.
=	Construction of barrage holds the untreated water in front of the Ghats that has a bad odour and is polluted.	Lately, dams are seen more as hydropower generators with flood mitigation, irrigation and drinking water supply only being additional benefits. The same stand for the dams in the Yamuna region found in the TTZ. Therefore there is a need to monitor the proposals and the existing dams currently present in the Yamuna river in the region and assess their technical need and requirement and therefore implement the same.	 Plans to develop a WTP at the upstream end of the river. The downstream WTP site can be redeveloped as an STP. There should be other locations for developing STPs as per requirement. Construction of the barrage should be relooked as per the requirements of the Yamuna Action Plan.

No.	Issues	Strategies	Kecommendations
≔	Dependency on ground water	Strategies to prepare basic infrastructural	- Use of solar power available in suitable
	through hand pumps and tube wells	plan for the city is required	quantities throughout the region.
	is at a large number. Slums are	Strategies to operationalize and use, old and	
	totally dependent on ground water.	new rainwater harvesting systems in the city	
	Connections through piped water	should be made mandatory	
	supply system is mostly in the	Extraction of ground water to be stop slowly	
	Cantonment area of the city.	with implementation of other plans	
	The inner city septic tanks and	erage	- Formulation and implementation of
	sewer networks have become	should be immediately stopped from	'Infrastructure Plan' is required.
	defunct due to poor maintenance	entering the river directly and re-constructed	 More STPs to be installed in the city.
	and the sewer finds the road side	to be carried to a STP and reused as grey	- The treated waste water to be used in
	open drains and finally discharged	water.	industries.
	into Yamuna River directly causing	Old defunct and poor sewer lines to be	 Desilting of drains to remove the garbage
	serious water pollution.	replaced and closed underground drains to	and providing screening chambers to
		be constructed all over the city.	check on the garbage.
	Topographical level difference in the	The sewerage plan and the pipelines need	- Preparation of City Sanitation Plan
	city is such that the general slope of	to be relooked at to avoid the water flowing	- New generation of sewage treatment
	the city of Mathura is from south	into river.	technologies such as membrane
	west to north east towards river	Strategies should be developed to treat	bioreactor (MBR) can treat the
	Yamuna with the result that all the	sewage on site.	wastewater almost to the quality of river
	drains rising from any point in the		water. These technologies can be used for
	city eventually flow into the river and		the new STPs that will be installed in cities.
	the drains discharge untreated		- Decentralised systems with grey water
	sewage into the river.		reuse needs to be initiated in the cities.
			- The rest of the treated water can be used
			in agriculture
			- Release of sewerage and drainage water
			in rivers has to be stopped with immediate
			effect
			- Policies and Guidelines:
			 National Sustainable Habitat Standards for
			the Urban Water Supply and Sewerage
			sector

SI. No.	Issues	Strategies	Recommendations
			 National Sustainable Habitat Parameters on Urban Storm Water Management'
		<u> </u>	 National Service Level Benchmarks
			 CHEEPO MANUAL ON SEWERAGE AND SEWAGE TREATMENT 2012
	Although the connections are	- Use of renewable sources of energy like	- CESE Company in Kolkata or any other
	sufficient in number, electricity	solar power technologies shall be	to be designated to supply electricity to the
	supply is hampered due to power	encouraged.	region.
	cuts and power failures.	2	- Solar panels and energy to be used as an
	Improper street lights in majority		alternative and should be mandatory in
	areas.		every city with incentives The Color Ctudy property and the referred
		ベ フ	for this activity
			- Policy and Guidelines:
			for energy efficiency in Residential and
			Commercial Buildings 2011
			 Jawaharlal Nehru National Solar Mission
			Guidelines for Development of Solar Parks,
			Ministry of New & Renewable Energy, 2016
			 Guidelines for Grid-connected Small Scale
			(Rooftop) Solar PV Systems for Tamil
			Nadu, 2014
		- Strategies for a proper SWM Plan is	- City Sanitation Plan to be prepared for all
	and the garbage is thrown on the	mandatory for the city in the region	the region having strategies
	roadside.	- strategies should be based on a zero waste	adopt blo-degradable waste and
		management system	alternative use.
		<u></u>	 Promoting zero waste
		outside the city with waste	 Promoting Monitoring Projects like the
		composting and waste to energy	PAS Project in Gujrat and Maharashtra
		components added to it.	and
			Manual On Solid Waste Management Solid Waste Management
			Systems Office 2000

<u>.</u>	Issues	Strategies	Recommendations
No.			
			MUNICIPAL SOLID WAS
			TEMANAGEMENT MANUAL Part III: The
			Compendium 2018
			 National Sustainable Habitat Standards for
			the Municipal Solid Waste Management
			 City Sanitation Plan under National Urban
			Sanitation Policy 2016
			 Waste Management Rules 2016
		3	TOOLKIT FOR IMPLEMENTATION OF
			SOLID WASTE MANAGEMENT RULES,
			2016
			National Service Level Benchmark
	There is no proper segregation and	- Land fill site to be identified, preferably in the	- A zero waste management system shall be
	regular collection of garbage. It is	outskirts of the city limit.	adopted. Small composting plants can be
	being dumped on the roadside or	- Awareness to be created among citizens	set up in a decentralised manner where
	upon vacant land parcels in the	and workers about waste segregation.	compost will be converted to fertilisers and
	vicinity. The dumping ground is	- Proper garbage collection and segregation	the gas can be used for energy to run the
	located 7km away from the town.	arrangements to be adopted and executed	compost plant.
		by the Nagar Nigam.	- Segregation made at source to be
			encouraged and all waste to be segregated
			as per MSW Rules 2016 into three bins:
			biodegradable, recyclable and others.
			- Elimination of manual handling of waste
	- -	· · · · · · · · · · · · · · · · · · ·	and provision of PPES to Workers.
	odies and na	- Ecological Conservation Plan to be prepared	- URDPFI Guidelines 2014 to be followed to
	like torest are not maintained	tor the city to avoid encroachments.	allocate and protect land for this sector in
	properly.		the new Master Plan
			All water bodies in the city existing in
			2018 to be protested, rejuvenated and
		-	;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;
	The current water supply is not	- Adequate pipe line network for water supply	- Water Management Plan has to be
	existing population Ground water is	and pumping system is to be provided. New feeder mains shall also be provided	riepared.
	בייטישואל אלואסוס יוסיישואלא אמיני יס	- ולפעי וכפעבו ווומווים פוזמוו מוסט מפ מיסיימכע.	

S. No	Issues	Strategies	Recommendations
	a dependable source of water supply		- Rain Water Harvesting at Household
	in the city. This has resulted in		level and ward level to be introduced.
	tremendous decrease in ground		
	water levels in past few years.	4	

Firozabad - Shikhohabad:

S. S.	Issues	Strategies	Recommendations
_	Defining growth trajectories and functional	nctional base	
_	- Unplanned growth in the city not	 Some Industrial units are still inside the city 	- The industrial area should have buffer
	according to the proposed master	which needs to be relocated without	zone of 200mts of green all around to
	plan	disturbing the employment of workers	mitigate the direct impact of pollution on
	- Congestion inside the city inner		residence
	lanes.		- Hierarchy as per URDPFI Guidelines
			2014 need to be followed
			- Identifying non-conforming activities and
			relocating them to suitable location with
			pre-planned development.
:=	- In some areas old industries are	- Redevelopment of Industrial zones to be	- Relocation of polluting industries and pre-
	still working these need to be	provided as per the proposed Master Plan	planned development with green zone
	relocated to outer areas towards		development
	Sikohabad		- Every industry should have safety
	- The existing industries does not		measures
	have safety measures.	> >	- Environmental management plan should
	- The waste generated by		be prepared not only for large but also for
	industries are not getting treated		small and Household industries
	properly.		- The new categorisation of industries
	- The pollution generated by		released by the Ministry of Environment,
	industries present in core area		Forest and Climate Change on 5th March
	are effecting the health of		2016 needs to be followed for this activity.
	residential areas also.		

	-	-	
S	Issues	Strategies	Recommendations
	- As per CSIR-NEERI report 2016, the air quality of Raja-Ka-Tal (industrial Area), Tilak Nagar (residential area) and DIC (Mixed use) are very low.		 Unregistered industries should be cancelled and removed with immediate effect. Alternative innovative and creative industries like has been identified under the "Mapping and Assessment of Creative Industries" Report by UP Tourism in March, 2018 needs to be promoted. Investments in small-scale entrepreneurialism by the UP Government has to be encouraged. Skill building Institutions to be opened in this respect.
≔	- Commercial areas are located in the core of the City mixed with residential activities Current Commercial areas in the city as per the URDPFI Guidelines but for the future there is a need of Central Business District in the city There can also be different commercial centers in various parts of the city as per the proposed Master Plan of the city As per observation, the shops are encroaching the roads which are creating congestion and traffic problems - Encroachment on Footpaths (should follow building bylaws)	Central Business District to be proposed so as to have a proper commercial market in the city	- Enforcement of byelaws and high penalty for encroaching shops on roads which are creating traffic congestion - Separate market for glass industries near to manufacturing area but away from residential areas Plan for developing a Central Business District as per URDPFI Guidelines 2014 to be implemented in the city
	Urban Settlement Forms		

SI. No.	Issues	Strategies	Recommendations
	- The Current Land-use doesn't	- Regulation for residential and mixed use	Buffer zone and setback of plots to be
	conform to the Proposed Land-	development	defined in byelaws
	use of 2031. Current residential	 Supporting mixed use development with 	- Increasing FAR
_	areas are 61 % which is higher	proper regulation and management of traffic	 Upgradation of dilapidated houses
	than the proposed Land-use and URDPFI quidelines.	routes	
	- Recreational areas are almost		
	negligible in the city only		
	accounting to 1 % of the total	2	
_	area.		
	 New Industrial Zones to be set-up 		
	as per the proposed Master Plan.		
2	Assessing and incorporating future infrast	infrastructure (physical and social) needs	
_	- Current water supply is 9.4 lpcd	- Water management plan should be	- Preparation of water management plan
_	which is very low and required	prepared	as per guidelines and Master Plan 2031.
_	water supply is 135lpcd	 Implementation of water treatment plan 	- Rain water recharge pits at household
	 Extraction of ground water at high 	- Rain water harvesting for increasing ground	level and city level
_	rate can affect ground water level	water recharge	 Water treatment plant should be installed
	1		- Policies and Guidelines:
_			 Manual on Water Supply and Treatment
			Systems (CPHEEO-1999) 2016
_			 Manual on Operation & Maintenance of
			Water Supply System (2005) 2016
			 National Service Level Benchmarks
=	aste water tre	- Sewage management plan should be	- Preparation of City Sanitation Plan as per
	facility in the city, Sewer	implanted	guidelines
	Treatment Plant is required.		 Separate effluent treatment in industrial
_	1		zone for waste water treatment
			 Adaption of recycling technique
			- Policies and Guidelines:
			 Advisory Note on Recent Trends in
			Technologies in Sewerage System (March, 2012) 2016
			0.01

Ū		301133	Stratogios	Pocommondations
8		20000	on aregies	
				 Latest Manual on Sewerage and Sewage Treatment Systems (2013) 2016
Iii	ı	Total Solid Waste Generated in -	Adaptation of Zero Waste management	- Proper Landfill Site is required.
		the city 725.06 MT only 40 to 50% - of the waste is collected by Nagar	Solid Waste Management Plan should be prepared	- Collection, segregation and treatment of Waster
		Nigam.	-	- Recycle of Waste and conversion of bio
	ı	Door to door collection of Solid		waste into Bio-Fuel
				- Adaption of new recycling and reuse
	ı	Open dumping can be seen at	2	technique of city waste
		many places.		
	ı	No treatment of Waste generated		 Manual on Solid Waste Management
		from Industries		>НЕЕО-2000) 2016
			< >	MUNICIPAL SOLID WAS
				TEMANAGEMENT MANUAL Part III: The
				Compendium
<u>></u>	ı	Only 1% parks and recreational -	Land utilization of core area for green	- Development of parks reserved in master
		areas are available at the present.	spaces	plan and URDPFI Guidelines 2014.
	,	Vacant plots are treated as -	Vertical gardens	- Removing illegal activities from reserved
		dumping sites.	2	park and recreational land.
	ı	Breathing space require to absorb		- Promoting green zone development
		pollution is not available in the city		surrounding polluting industries
	ı	As per master Plan 2031, 14% of		 Plantation along roads
		Parks and recreational areas has		vertical gardens, espec
		proposed only in outskirt of city,		congested and core area to absorb
		the core area needs to develop		pollution
		green areas. And only 6% vacant		
		land is available within city which		
		is quit challenging to provide 14%		
		or Green Spaces.		
>	,	Current water supply is 9.4 lpcd -	Water management plan should be	Preparation of Water Management Plan
		which is very low and required water supply is 135lpcd	prepared Implementation of water treatment plan	as per guidelines and Master Plan 2031.

S. Š	Issues	Strategies	Recommendations
	 Extraction of ground water at high rate can affect ground water level 	- Rain water harvesting for increasing ground water recharge	ain water harvesting for increasing ground - Rain water recharge pits at household level and city level
			 Water treatment plant should be installed

Hathras:

<u>.</u>	Issues	Strategies	Recommendations
No.			
1	Defining growth trajectories and functional base	nctional base	
_	- The commercial areas exhibit a	- Strategies to regulate all commercial and	- Regularisation of informal commercial
	great degree of unregulated	service centres on the main streets and	areas.
	development. Land allocated for	lanes of the city and free the entire core city	- Identification and control measures to be
	residential purposes is now	for movement of tourist and religious	adopted for areas exhibiting mixed land
	experiencing non-conforming	activities.	use.
	commercial development.		- No new development except for
			redevelopment proposals on dilapidated,
			old and closed constructions should be
			allowed.
	- The land allocated for open	 Strategies to re-densify the core areas. 	- Land demarcated for parks and
	spaces is also being consumed	 Water bodies can be cleaned, rejuvenated 	recreational purpose in the Master Plan of
	by residential development, thus	and used as recreational spaces.	2023 needs to be converted for the same
	resulting in non – conforming land		use.
	use.		- Land available from old dilapidated
			structures and sick industrial areas can
			also be used for open spaces and
			recreational green areas.
	- Residential development is also	 Strategies to be adopted in the new Master 	- The industries currently working within the
	seen in industrial estate areas.	Plan to relocate conforming and non-	residential areas to be shifted and
		conforming activities within the city	relocated to new areas demarked for non-
			polluting industries.
<u>:</u>	 High tech township and Tourism 	- Revival strategies for the Bagh and	- Plan of action for green, recreational areas
	Policy have been formulated for	Baghichis can be taken up.	to be taken up with immediate effect

Ū	301133	Stratodios	Pocommondations
S	00000	College Colleg	
	the city. These are concern for future growth of the city and needs to be relooked.	Small to Medium Scale industrial hub can be proposed with non-polluting industries	- All Baghs and Baghichis to be restored as part of the plan
	- Chemical and chemical based, oil-based industries and brick	Closer of polluting industries in the region and promotion with incentives in alternative	- The new categorisation of industries released by the Ministry of
	kilns are still illegally operating,	industries as per availability of raw materials.	Environment, Forest and Climate
	even though they are banned	Strategy to make the TTZ, a region that	Change on 5th March 2016 needs to be followed for identifying nolluting
		invests in small-scale entrepreneurialism,	S.
		and places an emphasis on education, arts	- Unregistered industries should be
		and culture.	cancelled and removed with immediate
			ellect. - Old technology to be converted to The
			Vertical Shaft Brick Kiln technology,
			developed in China, that is an energy-
			efficient, environment friendly and
			economically-viable means to produce
			quality bricks.
		2	 Chemical and Oil Industries need to follow
			the guidelines mentioned in Environment
			Protection Act of 1986 and also follow
			the norms of 'Pollution Control Board'.
			- Alternative innovative and creative
			the "Mapping and Assessment of
			Report by
			0
			promoted.
			- Investments in small-scale
			entrepreneurialism by the UP Government
			has to be encouraged.
			- Skill building Institutions to be opened in
			this respect.

	Issues	Strategies	Recommendations
	- Non - availability of uninterrupted	e Industrial Policy to be formulated and	- CESE Company in Kolkata or any other
	r supply at lower rate, po	9	to be designated to supply electricity to the
	road connectivity, lack of	and	region.
	upgraded technology, absence of	th incentives in	- Solar panels and energy to be used as an
	Mell Toffmulated State Industrial	developing the Industry. Retter Technology Un-gradation Scheme	alternative and should be mandatory in avery city with incentives
	issues.	with tracking mechanism.	The Solar Study prepared can be referred
			for this activity
	- The city is known for its Baghs	Revival strategies for the Bagh and	- Plan of action for green, recreational areas
	and Baghichis which have now	Baghichis can be taken up.	to be taken up with immediate effect
	been encroached upon by other	Small to Medium Scale industrial hub can be	- All Baghs and Baghichis to be restored as
	activities.	proposed with non-polluting industries	part of the plan
	- The city also has numerous		
	temples which lack maintenance.		
7	Multi-nodal urban structure and public places and movement patterns	lic places and movement patterns	
	- Lot of illegal housing colonies in	Strategies to control development in the	- Strict development controls to be
	the outskirts due to formal	urban fringes along with the planning	applied in the urban fringes.
	housing supply	authority	- Slum Development Plan for the city
		Strategies to regulate development and	
		control over urban sprawl in the fringes.	
	- About 1.2 lakhs houses require	Strategic Housing Policy to be prepared for	- Strategic Housing Policy to be
	by 2051	the city as per future requirement	formulated for the next 10 years for both
			the cities and to be strictly implemented.
		the Municipal Boundaries	line with the N
			(NUHHP) 2007 of the MoHUA and in consultation with HUDCO
က	Assessing and incorporating future infrast	infrastructure (physical and social) needs	
	- The current water supply is not	Adequate pipe line network for water supply	- As per estimated URDPFI Guidelines 2014
	sufficient to fulfil the demand of	and pumping system is to be provided.	12 MLD water treatment
	the existing population. Ground	 New feeder mains shall also be provided. 	is required considering 70 lpcd. Land
	water is a dependable source of		requirement for the same is 0.2 Ha.
	water supply in the city. This has		

<u>S</u>	Issues	Strategies	Recommendations
No.			
	resulted in tremendous decrease		- Water Management Plan has to be
	in ground water levels in past few		Prepared.
	years.		- Rain Water Harvesting at Household
		•	level
			- Policies and Guidelines:
			 Manual on Water Supply and Treatment
			Systems (CPHEEO-1999) 2016
			Manual on Operation & Maintenance of
		2	Water Supply System (2005) 2016
			- National Service Level Benchmarks
	- The Drainage System is both	Strategies to prepare basic Sewerage and	- Preparation of City Sanitation Plan
	open and closed. There are	Drainage infrastructural plan for all the cities,	- Decentralised systems with grey water
	sewage pumping stations and	towns and villages	reuse needs to be initiated in the cities.
	one sewage farm, but not	- Strategies to Use Grey water for alternative	- Release of sewerage and drainage water
	adequate sewage treatment	uses in the domestic and industrial sectors	in rivers has to be stopped with immediate
	(D)		effect
	n open nallahs a		- Policies and Guidelines:
	system resulting	2	 National Sustainable Habitat Standards for
	clogging. Solid Waste is also		the Urban Water Supply and Sewerage
	being disposed-off in the drains.		sector
	1		 National Sustainable Habitat Parameters
			on Urban Storm Water Management'
			 National Service Level Benchmarks
			CHEEPO MANUAL ON SEWERAGE AND
			SEWAGE TREATMENT 2012
	- Although the connections are	 State Industrial Policy to be formulated and 	- CESE Company in Kolkata or any other
	sufficient in number, electricity	ıted.	to be designated to supply electricity to the
	supply is hampered due to power	lygienic and adopt mode	region.
	cuts and power failures.	technology along with incentives in	- Solar panels and energy to be used as an
		developing the industry.	alternative and should be mandatory in
			every city with incentives

<u>:</u>	Issues	Strategies	Recommendations
8		1	
		- Better Technology Up-gradation Scheme	- The Solar Study prepared can be referred
		with tracking mechanism.	for this activity
	- There is no proper segregation	- Land fill site to be identified, preferably in the	- Solid Waste Management Rules' 2016
	and regular collection of garbage.	outskirts of the city limit.	shall be adopted and executed.
	It is being dumped on the	- Proper garbage collection and segregation	 A zero waste management system shall be
	roadside or upon vacant land	arrangements to be adopted and executed	adopted. Small composting plants can be
	parcels in the vicinity. The	by the Nagar Nigam Parishad.	set up in a decentralised manner where
	dumping ground is insufficient in		compost will be converted to fertilisers and
	managing solid waste. This		the gas can be used for energy to run the
	condition has led to unhygienic		compost plant.
	conditions.		- Policies and Guidelines:
	1		 Manual on Solid Waste Management
		< >	Systems (CPHEEO-2000) 2016
			MUNICIPAL SOLID WAS
			TEMANAGEMENT MANUAL Part III: The
			Compendium
	- The built to open ratio is less as	- Revival strategies for the Bagh and	- URDPFI Guidelines 2014 to be followed
	the land is being encroached	Baghichis can be taken up.	for norms and regulations of open spaces
	upon by other developments and	2	and green areas.
	activities.		 New Master Plan to allocate more land for
			this sector.

Bharatpur:

S S	Issues	Strategies	Recommendations
-	Defining growth trajectories and functional base	ictional base	
_	As per Master Plan 2023, the city	- Strategies for proper implementation of the	- Regularisation of informal commercial
	should experience growth in all	Master Plan with strict regulations and bye-	areas.
	directions except the Southern	laws	- Identification and control measures to be
	direction due to the presence of		adopted for areas exhibiting mixed land
	Keoladeo National Park. But in the		nse.

Ū	30133	Ctratodios	Docommondations
No.	sance	otrategres	Necollinendations
	southern part of the city, the vacant lands and waterbodies are being used for construction purpose.		 Protecting the National Park and the Bird Sanctuary and the area around as these are part of the National Heritage
<u>:=</u>	The walled city and the immediate core area of the city are quite dense, unorganised and exhibits organic residential growth. It has narrow lanes, insufficient open spaces and mixed use land development.	Renewal strategies with old architectural style needs to be planned for this part of the city. No new development to be allowed within this region.	- New Master Plan to be prepared for the city that gives directives to decongestion and re-densification strategies for the city.
	There are more than 100 oil mills in Bharatpur due to mustard grown in large quantity in the surrounding areas. These mills are polluting in nature.	Strategies to stop polluting industries and if at all allowed to take up measure like use of natural gas, plantation of trees, etc. to be adopted. Green technologies need to be adopted in order to sustain such industries, as they are prominent economic resources. RICO to strengthen its industrialisation regulations with strict rules	- Environment Impact Assessment need to be carried out Industries need to follow the guidelines mentioned in Environment Protection Act of 1986 and also follow the norms of 'Pollution Control Board'.
	Stone and building construction materials shops are very common that leads to air pollution.	Strategies to develop well-covered shops so that it does not pollute the air and also to promote more tree plantation in the city.	 Stone and building construction materials shops to be relocated outside the city away from residential areas and the Heritage sites specially bird sanctuary
	Non - availability of uninterrupted power supply at lower rate, poor road connectivity, lack of upgraded technology, absence of well formulated State Industrial Policy is some of the prominent issues.		 CESE Company in Kolkata or any other to be designated to supply electricity to the region. Solar panels and energy to be used as an alternative and should be mandatory in every city with incentives State Industrial Policy to be formulated and implemented.
	About 61% of industries fall in the red category generating pollution	Closer of polluting industries in the region and promotion with incentives in alternative industries as per availability of raw materials.	The new categorisation of industries released by the Ministry of Environment, Forest and Climate

SI.	Issues	Strategies	Recommendations
No.			
		- Strategy to make the TTZ, a region that	on 5 th March 2016 nee
		values innovative and creative industries,	followed for identifying polluting
		invests in small-scale entrepreneurialism,	
		and places an emphasis on education, arts	- Unregistered industries should be
		and culture.	cancelled and removed with immediate
			All red category industries to be
			stopped or shifted outside the city.
			Alternative innovative and creative
			industries like has been identified under
			the "Mapping and Assessment of
			Creative Industries" Report by UP
		\ \ \	0
			promoted.
			Investments in small-scale
			entrepreneurialism by the UP Government
			has to be encouraged.
			Skill building Institutions to be opened in
			this respect.
iii	- Bharatpur has a potential to be	- More tourism related sports/activities shall	- Tourism Plan for the city
	developed as a tourist	be encouraged.	- Strengthening the links between tourist
	destination, the accommodation	- This shall include forest safaris, heritage	activities and other economic areas, as
	facilities are not being utilised up	walks etc.	well as social and cultural players in the
	to their potential.		territory, to create opportunities.
	- Though sufficient tourism	·	- Strengthening the links between public
	infrastructure is currently		authorities to line up the strategies at
	available still the tourist footfall is		different scales, in different areas and with
	low.		different authorities
			- Integrating tourism planning, regulation,
			funding, communication and promotion
			policies in a shared strategy.
			 Boosting the entrepreneurial capacity of
			tourist areas by launching and establishing

SI. No.	Issues	Strategies	Recommendations
			other economic activities throughout the entire value chain - Promoting tourist service training and professionalization to ensure excellence and competitiveness Integrating tourist marketing into the city's communication, reputation and promotion strategy
<u>></u>	Keoladeo Ghana Bird Sanctuary which is declared as a World Heritage Site needs maintenance and protection	Strategies to protect the Bird Sanctuary to save the ecology of the city and the region is highly recommended	 Guidelines for protecting the Keoladeo Ghana Bird Sanctuary to be prepared based on the Guidelines for declaration of Eco-sensitive zones around National Parks and Wildlife Sanctuaries of MoEF.
2	Multi-nodal urban structure and public places and movement patterns	lic places and movement patterns	
>	The walled City with the fort and the moat around it, is congested and unhygienic	New Development within the walled city needs to be totally restricted. The moat needs revival and rejuvenation strategies to be prepared for its survival and protection.	Master Plan in lines with the Heritage Conservation and Development Plan needs to be prepared for Bharatpur City.
ဗ	Assessing and incorporating future	Assessing and incorporating future infrastructure (physical and social) needs	
	The current water supply is not sufficient to fulfil the demand of the existing population. The existing water supply system comprises mainly of asbestos cement pipes.	Water management plan should be prepared Implementation of water treatment plan Rain water harvesting for increasing ground water recharge	 Water Management Plan has to be Prepared. Rain Water Harvesting at Household level shall be encouraged. As per estimated URDPFI Guidelines 2014 calculation for the year 59 MLD water treatment plant is required considering 135 lpcd. Land requirement for the same is 1 Ha. Policies and Guidelines: Manual on Water Supply and Treatment Systems (CPHEEO-1999) 2016

ō	30100	0,000	one itelement
S S	00000	ori aregies	Necolline
			 Manual on Operation & Maintenance of
			Water Supply System (2005) 2016
			 National Service Level Benchmarks
	- There is no proper drainage or -	Strategies to prepare basic Sewerage and	 Preparation of City Sanitation Plan
	sewerage system.	Drainage infrastructural plan for all the cities,	- Decentralised systems with grey water
	- The city majorly constitutes of	towns and villages	reuse needs to be initiated in the cities.
	open drains which due to its	Strategies to Use Grey water for alternative	- Release of sewerage and drainage water
	inadequate carrying capacity,	uses in the domestic and industrial sectors	in rivers has to be stopped with immediate
	tends to overflow, especially		effect
	during the rains. The overflowing		- Policies and Guidelines:
	water floods the roads and		 National Sustainable Habitat Standards for
	causes hindrance in transits. It		the Urban Water Supply and Sewerage
	also mixes up with garbage	<	sector
	dumped in the open and thus,		 National Sustainable Habitat Parameters
	causes unhygienic conditions.		on Urban Storm Water Management'
			 National Service Level Benchmarks
			 CHEEPO MANUAL ON SEWERAGE AND
			SEWAGE TREATMENT 2012
	Although the connections are -	State Industrial Policy to be formulated and	- CESE Company in Kolkata or any other
	in number,	nted.	to be designated to supply electricity to the
	supply is hampered due to power	ygienic and a	region.
	cuts and power failures.	technology along with incentives in	 Solar panels and energy to be used as an
		developing the industry.	alternative and should be mandatory in
		Better Technology Up-gradation Scheme	every city with incentives
		with tracking mechanism.	- The Solar Study prepared can be referred
			for this activity
	- There is no proper segregation and	Land fill site to be identified, preferably in the	- 'Solid Waste Management Rules' 2016
	regular collection of garbage. It is	outskirts of the city limit.	shall be adopted and executed.
	being dumped on the roadside or	Proper garbage collection and segregation	 A zero waste management system shall
	upon vacant land parcels in the	arrangements to be adopted and executed	be adopted. Small composting plants can
	vicinity The dumping ground is	by the Nagar Nigam Parishad.	be set up in a decentralised manner where
	Insumicient in managing solid waste.		compost will be converted to rertilisers and

<u>s</u>	Issues	Strategies	Recommendations
	This condition has led to unhygienic		the gas can be used for energy to run the
	conditions.		compost plant.
			 Policies and Guidelines:
		•	 Manual on Solid Waste Management
			Systems (CPHEEO-2000) 2016
			MUNICIPAL SOLID WAS
			TEMANAGEMENT MANUAL Part III: The
			Compendium
	The built to open ratio is less,	- There is a need to revive these lush green	- URDPFI Guidelines 2014 to be followed
	especially in the core city area as the	and open spaces.	for norms and regulations of open spaces
	land is being encroached upon by		and green areas.
	other developments and activities.		- New Master Plan to allocate more land for
		< >	this sector.

Tundla:

Si.	senss	Strategies	Recommendations
Š.			
_	Regional equity and networking of economic opportunities	economic opportunities	
	- Augmentation of Mathura-	 the Environmental Impact Assessment (EIA) 	- The pipeline needs to be lead down as per
	Tundla oil pipeline has been	is an integrated part of the planning of major	the Technical Standards and
	envisaged. But an EIA study has	development projects, and included in the	Specifications including Safety
	not been considered.	PDO and PIO. The EIA is intended to ensure	Standards for City or Local Natural Gas
		that factors associated with the environment,	Distribution Networks . This is as per the
		society and natural resources are included in	Petroleum and Natural Gas Regulatory
		the planning work on a par with technical,	Board of 2008.
		financial and safety-related factors.	- The development prospects and the
		- The EIA is intended to contribute to	environmental impact assessment for
		shedding light on matters that are relevant to	the oil pipeline transport needs to be
		both the internal and external decision-	conducted and monitored as per the
		making processes, and to guarantee the	environmental policies of the country.

5			
No.	Issues	orrategles	Kecommendations
		general public information on the projects. The process must be an open one, whereby the various players have the opportunity to express their opinions and influence the design of the project.	
	 Master Plan/ City Development Plan has not prepared 	Strategies to control development in the urban fringes	- Master Plan for the Tundla to be prepared with a 10 years' horizon.
	- There is unplanned and	Strategies to regulate development and	- URDPFI Guidelines 2014 norms and
	unregulated development in and around the city.	control over urban sprawl in the fringes.	regulations to be strictly applied in the development and growth of the city
	- The residential sector and the		
	demand for more housing		
	facilities are actually eating up	< >	
	the open spaces, agricultural		
	land and the water bodies within	<	
	and on the fringes of the city.		
	This shows that the city lacks in		
	regulations and controls over		
	development in the city		
	- Major market areas along	Decentralizing the railway Station Road	- Developing a buffer zone between the
	Railway Station Road creating		ınd the railway station r
			- Demarcating vending zone with
	- The Mandi Samiti has been		pedestrian activity
	d along		- Develop hotel and restaurants as per
	Awagarh road that is		norms and guidelines given in the URDPFI
	inaccessible.		Guidelines 2014
	l is being us		- Policies and Guidelines:
	nent of the M		 Policy guidelines for Street Vendors/
	.e. Hotels		Hawkers 2014
	Restaurants along Agra		
	Highway that needs to be		
	regulated and monitored.		

SI. No.	Issues	Strategies	Recommendations
	 unprotected heritage sites. the tourist inflow is negligible 	 Strategies to creation of new, exciting attractions: places that are attractive for both guests and locals due to their architecture, public space design, cultural highlights, etc. Addition of existing functioning and lively are some content of existing functioning and lively are some content. 	 To identify and enlist important heritage driven tourist spots as has been identified by the Heritage Conservation team in this Vision Document. To provide immediate identity and
		neighbourhoods outside the city centre to the "tourist map" of Agra	protection to these spots and sights To prepare Tourism Plan for all the with tourism accommodation infrastructure facilities.
က	Assessing and incorporating future	Assessing and incorporating future infrastructure (physical and social) needs	
	 Inadequate physical infrastructure and management can be well observed within the city. 	 Strategies to prepare an infrastructure Plan for the city Promote Solar power consumption 	- Master Plan for physical infrastructure for the city to be prepared and linked to the Master Plan of the city

Fatehpur Sikri:

SI.	Issues	Strategies	Recommendations
Š			
1	Defining growth trajectories and functional	nctional base	
_	- Master Plan/ City Development	- Development Plan need to be prepared for	- Preparation of integrated Master Plan for
	Plan has not prepared	controlled growth of the city and protection	Fatehpur Sikri as per URDPFI
	- Comparing the land use with the	of the heritage sites.	Guidelines 2014 and Heritage
	URDPFI guidelines, all the areas		Conservation Plans
	does not meet the requirement		
	except for commercial area.		
=	- Many new developments with	- Regulation and control over conforming and	- Application of URDPFI Guidelines 2014
	mixed land use character is	non-conforming development patterns	for norms and regulation on providing
	coming up.		facilities of tourist infrastructure

Recommendations	 Building Semi-Industrial Estate on the pattern of SEZ would be a significant step to enhance integrity in the carpet industry Common Facility Centre should be developed for both forward and backward linkages across all the major carpet hubs Modernisation of environment friendly production processes increasing the designer-weaver-buyer connect the weaver is ensured of a better price setting up vocational courses in carpet weaving among youth so that the craft and skill of Indian handmade carpets better wage structure and incentives for the workers 	- Requirement of minimum of 2 Local Shopping Centres along Bharatpur - Agra Highway of area 4600 sq.m. (URDPFI guidelines 2014)	 Tourism Plan for the city Strengthening the links between tourist activities and other economic areas, as well as social and cultural players in the territory, to create opportunities. Strengthening the links between public authorities to line up the strategies at different scales, in different areas and with different authorities
Strategies	Strategies to promote and support a network of dynamic, robust local carpet making industry by accommodating niche businesses, start-ups, social enterprise and diverse retailing. Promote skill building and related handcraft industries and also development of handicraft markets in the city Promote hygienic and adopt modern technology along with incentives in developing the industry	relocation of commercial areas falling in prohibited zone and proposing commercial hub away from monument complex proposal of market to promote carpet industry	city
Issues	- Residential and small-scale industries of carpet making are concentrated all around the city. The industries are polluting and unhygienic - Weaving Household Industry - Waste water from leather Industry and Die Industry is directly released in drains without treatment	- Mixed use development of residential and commercial use - Development of Commercial activities in prohibited zone of Heritage sites damaging the monuments.	- increasing number of tourist - inadequate tourism infrastructure - dearth in the number of hotels and accommodation facilities in the area.
SI. No.	≔		<u>></u>

SI. No.	Issues	Strategies	Recommendations
			 Integrating tourism planning, regulation, funding, communication and promotion policies in a shared strategy. Boosting the entrepreneurial capacity of tourist areas by launching and establishing other economic activities throughout the entire value chain Promoting tourist service training and professionalization to ensure excellence and competitiveness. Integrating tourist marketing into the city's communication, reputation and promotion strategy
2	Assessing and incorporating future in	Assessing and incorporating future infrastructure (physical and social) needs	
_	- Absence of physical - infrastructure, dependency on ground water and polluting - industries are other issues of the city	a a	- Master Plan for physical infrastructure for the city to be prepared and linked to the Master Plan of the city
	- 26 % of Households are not having piped water supply they are dependent upon Ground water source (well, Hand pump, Tube well, Borehole, spring, River, Canal, Tank, Pond, and Lake etc.) - Uncovered-unprotected water pipelines running over roads The distributary canal passing from Gurki Mandi, around 3km away from walled city is the source of sweet water.	Water Management Plan has to be Prepared. Adaptation of Rain Water Harvesting system	As per estimated URDPFI Guidelines 2014 calculation 5 MLD water treatment plant is required considering 70 lpcd & 135 lpcd water for 2018. Implementation Rain Water Harvesting at Household level and city level Improving existing water supply system Policies and Guidelines: Manual on Water Supply and Treatment Systems (CPHEEO-1999) 2016 Manual on Operation & Maintenance of Water Supply System (2005) 2016 National Service Level Benchmarks

SI.	Issues	Strategies	Re	Recommendations
No.				
	- Uncovered drainage system - Encroachment of development -	100 % sanitation within city STP needs to be installed as per guidelines	Preparation or and delivery	Preparation of Sewage Management Plan and delivery mechanism & Implementation
	on drainage system		of projects	-
	ge Line		100% toilet t	100% toilet facility to each households
	through Walled city creating			Public I ollets provision
	dilliygiellic collation alound it.		riali loi salo	Figure 101 sale collection, conveyance and
	· · ·		treatment or	anitary wastes, co
			the use	it low energy
		2	decentralised	d wastewater treatment
			The operation	on and maintenance (O&M)
			systems and	procedures need
		く つ	institutionalis	d in order to be effec
			to achieve a	to achieve and sustain the goal of 100%
			sanitation coverage.	verage.
			. National Urk	National Urban Sanitation Policy
			Policies and	Policies and Guidelines:
			National Sus	National Sustainable Habitat Standards for
			the Urban V	the Urban Water Supply and Sewerage
			sector	
			National Sus	National Sustainable Habitat Parameters
			on Urban Sto	on Urban Storm Water Management'
			National Serv	National Service Level Benchmarks
			CHEEPO M/	CHEEPO MANUAL ON SEWERAGE AND
			SEWAGE TE	SEWAGE TREATMENT 2012
	- As /per Census 2011, 10 % of -	Promoting solar energy system at city level	CESE Com	CESE Company in Kolkata or any other
	population has no electricity	and household level so that every HH will	to be designa	to be designated to supply electricity to the
	supply and their source of energy	self-sustained	region.	
	is like Kerosene, Solar energy,		Solar panels	Solar panels and energy to be used as an
	other oil etc.		alternative a	alternative and should be mandatory in
	- But as per primary survey and		every city wit	every city with incentives
	rvation the data conf		Giving subsi	Giving subsidy by distributing solar battery
	the ground situation. Many		to EWS & LI	to EWS & LIG households.

SI.	Issues	Strategies	Recommendations
No.			
	Households lacking electricity supply which force them to use alternate source of power like		- The Solar Study prepared can be referred for this activity
	diesel, wood, generators creating pollution.		
	- lakes and water bodies are	- Ecological Conservation Plan to be prepared	- URDPFI Guidelines 2014 to be followed to
	getting dry due to dumping of	for the city to avoid encroachments.	allocate and protect land for this sector in
	garbage		All water bodies in the city existing in
	ı		2018 to be protested, rejuvenated and
			restored.
	- Recreational Land is under	 Recreational areas has to introduce 	- Development of parks and gardens around
	recreation and open space.	<	heritage site
			- 2-3% of Recreational and Park area
			required as per URDPFI guidelines 2014
			- Creating buffer zone along Sewage line
			running through walled city and planting
			indigenous trees on both sides
	 Total tourist footfall is increasing 	- Preparing the tourist management plan with	Θ
	but growth rate of international	integration to Master Plan.	be strengthen by improving public
	tourist is declining due to lack of		transport system
	transportation, infrastructure and		
	sibility to man		facility within walled city (Room Rent
	within Empirical Complex.		Facility within residential area can
	(Preliminary analysis)		benefit local population, example: Goa)
	 Agra Fatehpur Sikri Connectivity 		- Open restricted areas for public within
	is very poor.		Imperial Complex to understand the
	 Tourist infrastructure and lack of 		Mughal Architecture by creating tourist
	accommodation facility		path
	Jutla, R.		- Conservation of unprotected monuments
	Fatehpur Sikri: A Utopian		and natural heritage
	Approach to Urban Planning and		

SI. No.	Issues	Sé	Strategies	Recommendations
	Design, Southwest State University, USA	Southwest Missouri rsity, USA.		

Govardhan:

<u>.</u>		Issues	Strategies	Recommendations
No.				
~		Defining growth trajectories and functional base	tional base	
	1	Private realtors building luxury -	Strategies to prepare a heritage	- Preparation of integrated Master Plan
		condominiums and gated	conservation plan and a master plan for the	- Proposing no development zones
		residential communities are	city.	surrounding water bodies and Kunds.
		encroaching upon the farmland -	Development controls and regulations to be	
		around the hill.	implemented protecting the hills, kunds,	
	1	The existing settlements are	groves and vans. Farming and pasturelands	
		expanding into the vans and the	should be restricted from encroaching upon	
		groves are being replaced by	the groves.	
		agricultural fields or housing -	Restorations and conservation tools to be	
		leading to unplanned urban	adopted while planning for the future growth	
		growth	of the region	
	1	Unplanned growth and		
		development all along the		
		parikrama pathway.		
	1	Proposals given in Master Plan		
		2021 has not implemented yet		
		except the development of	>	
		Parikrama Road		
	1	As per Master Plan 2021, there	Closer of polluting industries in the city and	- Unregistered industries should be
		were 45 types of small scale	promotion with incentives in alternative	cancelled and removed with immediate
		industries in 2002 which includes	industries as per availability of raw materials.	effect.
		oil industries, metal -	Strategy to promote innovative and creative	- Alternative innovative and creative
		manufacturing, furniture,	industries like tulsi mala making, invests in	industries like has been identified under the
		electrical workshops etc. But	small-scale entrepreneurialism, and place	"Mapping and Assessment of Creative
		these are located inside the city	an emphasis on education, arts and culture.	

S.	senssl	Strategies	Recommendations
No.			
	core making it congested and		Industries." Report by UP Tourism in March 2018 needs to be promoted
	Jaint village in Govardhan is the		- Investments in small-scale
	home of the authentic tulsi mala,		entrepreneurialism by the UP Government
	where every person is groomed		has to be encouraged.
	rrom childhood to pursue the craft. Mahawan is the sweet		 Skill building Institutions to be opened in this respect.
			-
	producing the mouthful kheer		
	mohan, inviting brisk sale from		
	- Encroachment of Commercial -	Relocation of unauthorised development	- Proposal of two Local Shopping Centre of
	.=	in restricted zone to suitabl	area 4600 sq.m. (URDPFI guideline
	Heritage sites damaging the	Street vending regulation	2014)
	monuments.		l of commercial activity a
	- Street vendors creating		Bayana and Mathura Road with
	congestion		pedestrian activity and provision of Parking
			area
	- As per projection, the tourist -	Tourist management plan should prepared	- Tourist movement plan with defined entry
	visitors population is estimated to -	Proposed ground for accommodating tourist	and exit
	increase by 25 million for which	and parking area	 Proposal of one-way movement of tourists
	the adequate tourist facility need -	Increasing transportation facility	- Widening the narrow lanes and entry points
	to be proposed.		of the Kunds
			 Increasing the bus services in peak festival
	than 30 lac population visit		season
	Radhaku		- Provision of Parking and Campaign
	ima,		area as per Master Plan 2021 (88.96 ha
	Ekadashi and Purnima. The		area is proposed)
	accesibility is very poor from		
	Vrindavan and Mathura.		
	trar		
	overloading of passengers in		

S	Issues	Strategies	Recommendations
o z	buses can cause human lives during festival seasons - Unprotected and maintained Kunds and heritage areas Narrow entrances to enter the premise of Kunds Kunds and water bodies getting polluted by drainages entering to kunds where there no separation of rain water drain and sewage drain.		
2	Housing and Settlement pattern		
	- Unplanned development all over	- Re- Densification of core city	- Master Plan for the Goverdhan to be
	the city		prepared with a 10 years' horizon.
	- No buffer zone is provided in		- URDPFI Guidelines 2014 norms and
	residential area for widening the		regulations to be strictly applied in the
	narrow lanes		development and growth of the city
		2	
			- Redevelopment and conservation of houses within core area with facade
ဗ	Assessing and incorporating future	Assessing and incorporating future infrastructure (physical and social) needs	
	- 43 % of Households are not	- Water Management Plan has to be	- As per estimated URDPFI Guidelines
	having piped water supply they	Prepared.	2014 calculation 5 MLD water treatment
	are dependent upon Ground	 Rain Water Harvesting at Household level 	plant is required considering 70 lpcd & 135
	water source (well, Handpump,		lpcd water for 2018.
	Tubewell, Borehole, spring,		- Implementation Rain Water Harvesting at
	River, Canal, Tank, Pond, and		Household level and city level
	Lake etc.)		 Improving existing water supply system
	- Only 50 lpcd water supply which		- Increasing ground water recharge by rain
	is very less as per une guideimes		water narvesting system

SI.	Senes	Strategies	Recommendations
No.			
			- Semi-permeable pavement blocks for
			developing footpath and open spaces.
			- Plantation along Water Bodies, Kunds,
		4	Roads and within core area
			- Policies and Guidelines:
			Manual on Water Supply and Treatment
			Systems (CPHEEO-1999) 2016
			Manual on Operation & Maintenance of
			Water Supply System (2005) 2016
			 National Service Level Benchmarks
	- No provision for sanitation	ı in - STP needs to be installed.	- Preparation of Sewage Management Plan
	current situation		and delivery mechanism & Implementation
		<u> </u>	of projects.
			- 5 MLD capacity STP is required for 2018
			as per estimation.
			- 100% toilet facility to each households
			- Public Toilets provision
			- Plan for safe collection, conveyance and
			treatment of sanitary wastes, considering
			the use of low energy intensive
			decentralised wastewater treatment
			and maintenance
			systems and procedures need to be
			institutionalised in order to be effective as
			to achieve and sustain the goal of 100%
			sanitation coverage.
			- National Urban Sanitation Policy
			- Policies and Guidelines:
			 National Sustainable Habitat Standards for
			the Urban Water Supply and Sewerage
			sector

	ŀ			
<u>N</u> .		Issues	Strategies	Recommendations
				National Sustainable Habitat Parameters on Urban Storm Water Management
				National Service Level Benchmarks
				- CHEEPO MANUAL ON SEWERAGE AND SEWAGE TREATMENT 2012
	ı	10 % of population has no	Promoting solar energy system for making	- Two substation required as per URDPFI
		electricity supply and their source	city self-reliable and self-sustained.	GUIDELINES 2014 norms estimation for
		of energy is like Kerosene, Solar		2018 and 4 substations required for
	- 1	But as ner primary survey and		- Installing solar plants and wind furbines
		observation the data conflicting		- Giving subsidy by distributing solar battery
		the ground situation. Many		to EWS & LIG households.
		Households lacking electricity	<	
		supply which force them to use		
		alternate source of power like	<u> </u>	
		diesel, wood, generators creating		
	1	Dumping of garbage in water	SWM plan should be prepared	e management system
		podies	2	
	1	No proper collection method of		composting plant to be set up in a
		garbage and its disposal within		decentralised mechanism where compost
		town		will be converted to fertilizers, bricks etc
	1	30.52 MT waste generation per		and gas can be used for energy to run the
		day for which 30 Ha of Sanitary		compost plant.
		land requires from 2018 till 2038.		tion of Bio-Meth
	1			as Govardhan generates Bio
				degradable waste from animals, flower waster etc
	-	No provision of open and	Recreational and open areas has to	- Development of parks and gardens around
		recreational spaces	maintained	Govardhan Hill and Parikrama marg
	1			- Small open spaces within Town for
		space in Master Plan 2021,		recreational use
	\downarrow	collincing to existing situation		

SI. No.		Issues	Strategies	Recommendations
	<u> </u>	ne encroachment of		- 2-3% of Recreational and Park area
	de	development on open land		required as per URDPFI guidelines 2014
	- G	Sarbage dumping on open land		

7.1.2 Strategies and Recommendations for the City Level - Agra:

Issues	Strategies	Recommendations
Defining growth trajectories and functional base	ctional base	
Re-development and renewal has	Develop strategies for rehabilitating the inner city	- Preparation of a Complete Street
taken place all along the roads	networks.	Network Plan for the whole city and
leading to Tajganj area in a span of		amend it into the 2021 Master Plan as
6 years but the alleys and bays		per norms given in URDPFI Guidelines
leading to the inner part of the city		2014
has not been developed.		
The city displays an unplanned and	Master Plan to be prepared keeping the carrying	- Establishing density caps in inner cores
unregulated growth in all directions	capacity of the city and new developments to be	and precinct areas.
with a huge number of slums	taken place outside the city boundaries	 Temporary zoning of all abandoned sites,
encroaching in private and public -	Strategies to discourage slums and squatters from	unused waste lands and open spaces as
land.	growing within the city by promoting more	'recreational zone' and converted to
	development and economic growth in the	parks and gardens till they are developed
	surrounding villages and towns.	as per their original use in the 2021 Master
		Plan.
		- No piece of land should be left un-zoned
		with an assigned land use.
Unregulated and unplanned growth	Strategies for restoration and conservation along	Strict zoning recommended for all
all along the river is also an issue as	the river	parcels of land along the river.
the geomorphology shows that there	Strategies to stop any new development in this part	- Absolute prohibition of any kind of built
is extreme erosion and occurrence	of the city	form and construction on the flood plains.
of wastelands coming up all along	Removal and relocation of slums from the river front,	 Only special zones to be allocated along
the river.	particularly flood plains and encouraging	river banks for public access.

30133	Ctratogios	Docommondations
		All non-conforming use to be restricted along crematoriums, dhobi immersion, animal bath Fines to be imposed for codes.
- All industrial estates are not planned especially the Nunhai Industrial Estate that shows industries all along the roads with residences behind them.	- Planning, redevelopment and relocation of industrial hubs and non-conforming active industries, outside the city with only non-polluting white and green category of industries within the Municipal Boundary.	Development of a Comprehensive Industrial Plan with sustainable development strategies for Industries in Agra and amending it to the 2021 Master Plan for implementation.
 Shikardara Industrial area has sick and closed tanneries located in the area There are many unregistered/illegal industries that are still running within the city. There are many sick industries lying within the city central areas. 	- Removal of sick industries and allocating lands to more economical non-polluting white and green category of industries or alternate use - Strategies to relocate and removal of unregistered/ illegal industries from within the city limits - Strategies to remove sick and dying industries from within the city boundaries and using these lands to develop green and open spaces with plantations.	
As per the 2031 Master Plan, a leather park has been proposed along expressway XX	- Growth of any red and orange category industrial hub within the projected Municipal Boundary of the City and immediate periphery should be discouraged.	The 2031 expressway Master Plan to be reviewed and amended to remove any non-conforming industrial developments within projected City limits and immediate periphery.
The inner city area has narrow and unhygienic streets, which are being encroached by various handicrafts and small –scale activities that attracts tourists.	- Strategies to develop craft villages and handicraft markets and night markets distributed all across the city to release congestion from the core, as well as invite tourists to less visited heritage sites. Strategies to improve the infrastructure particularly roads, lighting and ventilation and waste disposal systems in areas where cottage industries are prevalent to encourage healthy growth and development of home based industrial clusters.	Development of proposals for Craft villages with feasibility plans and funding strategies. The identified projects should then be amended into the 2021 Master plan for implementation.

Issues	Strategies	Recommendations
	 Strategies to create cooperatives and societies in all neighbourhoods where cottage industry clusters are prevalent for better organised business platform, enhanced economy and skill building. 	
The petha manufacturing industries are small, shabby and located in unhygienic conditions within the inner part of the city.	er producers and retailers of the Petha should be encouraged and incentivised to the product in a hygienic manner with schnology	- The alternate Petha enclave developed by the Government at Kalindi Vihar to be improved with infrastructure as required for economical and quality
	Food Quality to be regularly checked by the Food Safety and Standards Authority of India in Agra	Skill building programs and training for alternate methods of producing Pethas with environment friendly means and hygienic waste disposal systems, to be held occasionally at the Petha clusters.
No proper documentation of the heritage buildings. Some of the heritage buildings are in a dilapidated condition	 Heritage Conservation and Tourism Plan to be prepared Identification of all heritage sites including heritage site of local significance to be done with the help of ASI Heritage coding and Conservation zoning codes to be reformed to address the protection of locally significant heritage sites along with National and Global sites. 	 Development of a 4 yearly Integrated Heritage and Conservation Plan. The Projects and proposals of the plan to be amended into the 2021 Master Plan for implementation. Zoning codes to be adopted to restrict developments and construction of built forms to conserve view sheds, heritage image, accessibility and networking. A Special Committee or Heritage cell to be constituted with ASI and the Tourism Corporation to consider all conservation related activities and for reviewing and approving any development around the best to the position of the po

Senes	Strategies	Recommendations
Proposals for constructing of a barrage downstream of Taj so that Yamuna river retains water and for development of a river front recreational will kill the rivers natural flow, its natural ecosystem and biodiversity	The barrage proposal should be reconsidered and reviewed with focus on future repercussions and not present short term benefits. The main interest should be the revival of the river in a natural way while conserving its ecosystem. Barrage will further deteriorate the river downstream, cause sedimentation and hasten erosion of the banks.	To review the barrage proposal and develop a strategic plan for revival of Yamuna with a natural Ecosystem, ravine development, afforestation, river deepening methods and wetland.
- Areas east and west of Taj Mahal along the river are totally neglected and needs intervention - Areas around Mehetab Bagh is growing in a haphazard manner with new slums thriving in the area.	Area with no built form development around it. Spatial, Conservation and Environmental Plans to be developed for this Special Area Precinct. Areas around Mehetab Bagh and the surrounding to be part of this Special Area.	Development of Integrated Plan for all heritage sites. The plan proposals and projects to be amended into the 2021 Master Plan for implementation. Special Zoning codes for lands within the prohibited boundary of the heritage sites to restrict built form, construction and nonconforming landuse. All parcels of land within the prohibited boundary to be recreational open spaces, parks and gardens. It is to be noted that the Open space ratio in Agra is way below the standards. The existing land use for open space and recreation is only 2.2 % whereas as a heritage city it should have 20-25%.UDPFI Guidelines 2014 to be followed in this respect.
Tourist destinations like Itmad-ud-Daula are not well connected with the city.	 Strategies to plan and conserve the other important heritage precincts to be taken up as a no development zone. Alternate tourist circuits and networks should be developed to connect the less visited heritage sites with the prominent and more visited heritage sites. 	Tourism Plan for the city Development of plans to create tourist circuits, heritage walks and strategies to promote tourism at less visited heritage sites. Plans and proposals to be then

•		
Issues	Strategies	Recommendations
	- Special programs like dance and music festivals to	amended into the 2021 Master Plan for
	be organized around less visited sites to make them	implementation.
	more prominent.	- Strengthening the links between tourist
	 The sites around the less visited sites to be cleaned, 	activities and other economic areas, as
	and make tourist friendly with gardens and heritage	well as social and cultural players in the
	walks.	territory, to create opportunities.
		- Strengthening the links between public
		authorities to line up the strategies at
		different scales, in different areas and with
		different authorities
		ing, .
		funding, communication and promotion
		policies in a shared strategy.
	<	 Boosting the entrepreneurial capacity of
		tourist areas by launching and establishing
		other economic activities throughout the
		entire value chain
		- Promoting tourist service training and
		professionalization to ensure excellence
		and competitiveness.
		Integrating tourist marketing into the city's
		communication, reputation and promotion
		strategy
Lack of tourist infrastructure.	- Strategies to Plan for tourist infrastructure in this	Sustainable Tourism Plan to be developed
	entire city to be taken up.	for the city and revised every 4 years, The
		plans and p0roposals should be amended into
		the 2021 Master Plan for implementation.
Redefining the role of the river		
- Stagnation of river water and	- Strategies to identify strict zoning ordinances to be	 Strict zoning to restrict or prohibit all non-
disposal of solid wastes into the	put in place for restricting pollution causing	conforming activities along the river.
river causing water pollution	industries along the river or close to the heritage	 No construction or built forms should
- Sewerage and drainage openings	sites.	be proposed on Flood Plains. River
into the river makes the scenario	- Strategies to be adopted to stop activities like	banks will only have natural plantations.
even worse.	visarjans during festivals, religious ceremonies	

Issues	Strategies	Recommendations
- The river is a clogged river with a thin stream running at one end.	along banks, washing, bathing, cremating etc. need to be strictly regulated.	- Restoration and Conservation of River Yamuna as a project to be taken up. The
more like a nalla	- Electric crematoriums to replace the conventional	Final Report on Restoration and
 Very slow river front development 	crematoriums along banks or relocated.	Conservation of River Yamuna Submitted
in progress	Strategies to bring in river front development by	to the National Green Tribunal 2013
 Ine river Yamuna which reduces to a trickle in the lean season 	creating more plantation all along the course, this will save the land from erosion and creation of	needs to be initiated and implemented with immediate effect.
exposes vast stretches of sand on	~	- Pioneering projects in Riverfront
its beds and banks which forms a		Development may be taken up as the
substantial source of Suspended particulate matter (SPM)	2	Sabarmati Riverfront Development project of Ahmedabad citv which was designed
- The low humidity prevalent in this		based on riverfronts of Thames in London
region, also promotes formation of		and Seine in Paris.
SPM		Diverting sewerage and drainage
		channels from entering the river. Penalty
		to be implemented to the Urban Local
		Body in laps of this process.
		The UP Irrigation & Water Resources
		Department is the nodal agency
	2	coordinating these different work streams
		to rehabilitate rivers to initiate the process.
		 Policies and Guidelines:
		 All guidelines of the Ministry of Water
		Resources, River Development and
		Ganga Rejuvenation
		 Guidelines for National Lake
		Conservation Plan 2018
The river is not given its heritage	The river needs to be projected as a heritage and	- Heritage codes and Zoning codes to be
status	included in al heritage and conservation plans. It should	reformed to include the River in all
	be well connected to the heritage sites as it was an	heritage and conservation plans and
	integral part of these sites when originally planned	conservation zoning proposals.
	during the Mughal period.	
Assessing and incorporating future	Assessing and incorporating future infrastructure (physical and social) needs	

	Sellss	Stratenies	Recommendations
	2000	מומנקאנה איני איני איני איני איני איני איני א	
ı	The physical infrastructure	 Strategies to prepare an infrastructure Plan for all 	
	network is bad with opened and	the sectors and implement the same in the city	developed. It should be reviewed and
			monitored yearly.
'	Coverage of services is also		- All projects and proposals of the plan
	absent in many places		should be amended into the 2021 Master
1	There is no door-to-door facility		Plan for implementation.
	in some parts of the city		
ı	The area covered by piped water	 Strategies to prepare basic infrastructural plan 	- Agra irrigation canal to provide water to
	network is only 85 per cent.	- Strategies to install Water Treatment Plants at	Agra city for drinking purpose as well.
'	Hand pumps and tankers meet	suitable locations	- Construction of an alternative canal in the
	the water requirement in	- Strategies to operationalise and use, old and new	region for water supply to be investigated,
	Sikandra-II, Bodla-II, Shahganj-	rainwater harvesting systems	planned and implemented
	III, Tajganj-II & III, Trans	- Extraction of ground water to be stop with	- Adoption of decentralised system is
	Yamuna-II & Ghatwasan-II	implementation of other plans	workable.
	areas.		- Preparation of Mater Plan for Drinking
1	The percentage of water loss		Water Supply and installation of WTPs.
	due to leaks from pipes and		 To encourage alternative sources of water
	pipes appurtenances ranges		supply like rainwater harvesting and grey
	between 9-37 per cent while		water reuse system to become mandatory
	UFW ranges between 40-45 per		 Extraction of ground water to be completely
	cent of the total supply, which is		stopped for a short term period until the
	gh.		level of ground water rises.
1	Poor raw water quality.		- Policies and Guidelines:
	Excessive water loss due to		 National Sustainable Habitat Standards for
	leaks in water pipes and pipe		the Urban Water Supply and Sewerage
	appurtenances.		sector
'	Damaged water mains and		 National Service Level Benchmarks
	distribution mains. Very low		 CPHEEO Manual on Water Supply and
	pressure at tail end.		Treatment 2015
1	Catchment area of the Zonal		 Guidelines on Urban Reforms Incentive
	Pumping stations is not clearly		Fund
	segregated.		 Manual on Water Supply and Treatment
1	Out of 15 blocks in Agra, 11 are		Systems (CPHEEO-1999) 2016
	in childal condition.		

Issues	Strategies	Recommendations
- Due to illegal boring for tube wells, installation of submersible pumps in households, deforestation, lack of rain water harvesting measures and concretization of parks and green zones of the city, the ground water table is fast depleting¹.		Manual on Operation & Maintenance of Water Supply System (2005) 2016
 Sewerage system is old, overloaded & choked There are huge waterlogged areas within the city. Poor sanitary conditions due to clogged drains, collection of household wastewater in open pits. Most of the sewage goes into the open drains, floods into the adjacent areas and finally gets dumped into the Yamuna. The system is badly silted, choked and damaged at number of places and overloaded due to the over exploitation of limited infrastructure. 	- A Sewage management plan needs to be developed and put into action. - Strategies should be developed to treat sewage on site. - Sewage recycling system should be developed and incorporated particularly in slums. - Strategies to prepare basic Sewerage and Drainage infrastructural plan for all the cities, towns and villages - Strategies to Use Grey water for alternative uses in the domestic and industrial sectors - Strategies to set up Sewerage Treatment Plants at suitable locations - Strategies to stop releasing sewerage water in the rivers and canals	 Sewage Management Plan to be developed. It should be reviewed and monitored annually. All projects should be amended into the 2021 Master Plan for implementation. Sewerage Management Plan should include waste disposal system proposals unique to site of source. Preparation of City Sanitation Plan for thel city New generation of sewage treatment technologies such as membrane bioreactor (MBR) can treat the wastewater almost to the quality of river wastewater almost to the quality of river waster. These technologies can be used for the new STPs that will be installed in cities. Decentralised systems with grey water
 The STPs are made to perform beyond capacity, but still treat only 10% of the sewage they receive. Taj East Drain is one of the most polluted and malodorous drains in the city 		reuse needs to be initiated in the city. The rest of the treated water can be used for agriculture Release of sewerage and drainage water in rivers has to be stopped with immediate effect

 1 https://timesofindia.indiatimes.com/city/agra/Agra-division-ground-water-level-depleting-fast/articleshow/46148548.cms

<u>S</u>	Saues		Strategies	Recommendations
				 Policies and Guidelines: National Sustainable Habitat Standards for the Urban Water Supply and Sewerage sector National Sustainable Habitat Parameters on Urban Storm Water Management' National Service Level Benchmarks CHEEPO MANUAL ON SEWERAGE AND SEWAGE TREATMENT 2012 Manual on Sewerage and Sewage Treatment Systems (2013) Advisory Note on Recent Trends in Technologies in Sewerage System (March, 2012)
Underground available	electricity supply	<u> </u>	Corporates can be invited from other states who can supply electricity in the region like the CESE Company in Kolkata, who is also serving in the state of Rajasthan. Use of solar panels and other energy sources should be made mandatory with incentives. Bio-gas or natural gas can be other alternatives	 Renewable Energy Plan to be developed for Agra. All proposals and projects to be then amended into the 2021 Master Plan for review and implementation. Solar panels and energy to be used as an alternative and should be mandatory in every city with incentives The Solar Study prepared can be referred for this activity Policy and Guidelines: National Sustainable Habitat parameters for energy efficiency in Residential and Commercial Buildings 2011 Jawaharlal Nehru National Solar Mission Guidelines for Development of Solar Parks, Ministry of New & Renewable Energy, 2016 Guidelines for Grid-connected Small Scale (Rooftop) Solar PV Systems for Tamil Nadu, 2014

	Sellas	Strateries	Recommendations
	Isance	Oil aicyles	Necollinellations
1	Waste is thrown on roads, streets,	 Bulk waste generators are to handle and treat their 	 City Sanitation Plan to be prepared for for
	vacant plots	own waste	the city having strategies to adopt bio-
1	Municipality vehicles throws the	 AMC to provide services to the entire city 	degradable waste and alternative use.
	collected waste in open dump	ero waste	 Promoting zero waste
	yards	management system	 Strict fines to be imposed for littering public
		- A scientific landfill site to be identified and	spaces.
		constructed outside the city with waste composting	- Trash bins should be provided at regular
		and waste to energy components added to it.	intervals both in residential and public
		- Strategies should be based on a zero waste	zones.
		management system	- Sewerage and Waste Management Plan
		- The bio-degradable wastes can be used as	should be developed annually to keep a tab
		fertilisers for the agricultural lands, as bricks for the	on the fast paced growth. It should be
		newly constructed development and removing the	reviewed and monitored every 6 months.
		brick kilns, etc.	- Promoting Monitoring Projects like the
			PAS Project in Guirat and Maharashtra
			- Policies and Guidelines:
			 Manual On Solid Waste Management
			MUNICIPAL SOLID WAS
			TEMANAGEMENT MANUAL Part III: The
			Compendium 2018
			 National Sustainable Habitat Standards for
			the Municipal Solid Waste Management
			 City Sanitation Plan under National Urban
			Sanitation Policy 2016
			 Waste Management Rules 2016
			TOOLKIT FOR IMPLEMENTATION OF
			SOLID WASTE MANAGEMENT RULES,
			National Service Level Benchmark
	Open spaces, bird sanctuaries,	- Strategies to be developed to conserve the bio	- Ecological Conservation Plan to be
<u></u>	parks are not maintained or	diversity of the city.	prepared for the city. The projects and
	protected.		proposal to be amended into the 2021

	Ctrotonio	Occitobacommono O
cancel	Oil aleglies	Die fer minimus
	 strategles to protect the Bird Sanctuary to save the ecology of the city and the region is highly 	Master Plan for review and implementation.
	ended	Guidelines for protecting the Bird
		_
	•	Guidelines for declaration of Eco-
		sensitive zones around National Parks and Wildlife Sanctuaries of MoEF.
Multi-nodal urban structure and pul	Multi-nodal urban structure and public places and movement patterns	
- Many houses in the slums are	- Strategies to Plan for slum Development with -	Rehabilitation of the slums should be an
pucca with brick wall, PCC	provision of infrastructure within them	immediate action. Many studies and
flooring whereas some people	- Proper access, congestion free and hygienic	DPRs have already been prepared for the
	conditions to be provided to all regulated slums	same. The DPR proposals should be
- There are many unregulated	 Unregulated slums to be taken up and registered 	reviewed and implementable projects
slums with no infrastructure	and pulling them under the same scheme.	identified. The projects should be then
provision and poor economic	 Livelihood options, skill building and education to be 	being amended into the 2021 Master Plan
conditions.	part of the Slum Development Plan	for implementation.
- 51% are notified slums while the		Job opportunities through the Uttar
remaining 49 are non-notified.		Pradesh Government Pro-Poor Tourism
- The slums are distributed all		Project should be implemented to
across the city with the highest		encourage better quality of life.
density occupying the area along		Slum Employees from Industries that have
the river in the Trans Yamuna		shut down should be provided alternate
zone.		options for employment generation, to
- 50% houses in slums are pucca		reduce unemployment and poverty.
with brick wall, PCC flooring		Changes in laws, regulations and policies
whereas the rest 40% people live		to protect and promote informal workers
in jhopris or shacks.		and their livelihoods
		Creation of new livelihood opportunities
		$\overline{}$
		it like engaging in heritage craft
		markets, etc.
		Promote locate creative industries to
		encourage craft villages
	1	Policies and Guidelines:

Issues	Strategies	Recommendations
		 GUIDELINES ADDITIONAL CENTRAL
		ASSISTANCE TO STATES FOR SLUM
		DEVELOPMENT
		 PPP Modal for Affordable Housing 2017
	•	 LOW COST SANITATION SCHEME
		(ILCS) Guidelines
- Existence of squatters is also	- Squatters are to be relocated to a nearby	- Low cost housing units or night
prevalent in many parts of the	designated land and made regular with livelihood	shelters as per URDPFI Guidelines 2014
city. They are migrants from	options.	to be developed to relocate or rehabilitate
nearby villages and towns.	 In-situ development should be the first option to be 	existing squatters.
	taken up.	Rural Urban interface to be well planned
	 Migration should be stopped by adopting strategies 	to curb migration from rural to urban.
	to discourage more slums and squatters from	- Policies and Guidelines:
	growing within the city by promoting more	 Guidelines Night Shelter for Urban Shelter
	development and economic growth in the	less
	surrounding villages and towns.	Shelter and Sanitation Facilities for The
		Footpath Dwellers in Urban Areas 1992
		 Report of The Working Group On Migration
		2017

7.1.3. Strategies and Recommendations for the Precinct Level - Taj Mahal and Surrounding:

SL NO	ISSUES	STRATEGIES	RECOMMENDATIONS
_	Restoring the balance between environment and development	nment and development	
	RIVERFRONT DEVELOPMENT		
	- Since the river is fast dying it is -	- All reclaimed land should be returned back to the	Strict zoning to restrict or prohibit all non-
	essential to be very careful about	river and river rehabilitation strategies should be	conforming activities along the river.
	the choice of development on the	implemented.	No construction or built forms should
	river front.	- Infrastructure upgradation, particularly the major	be proposed on Flood Plains. River
	- It should be ensured that flood	drains running through the precinct like the Taj	banks will only have natural plantations.
	protected zones should be free of	east drain.	Pioneering projects in Riverfront
	any building construction.		Development may be taken up as the

SE	ISSUES	STRATEGIES	RECOMMENDATIONS
	- Many of the river fronts are encroached by squatters though these areas are assigned as green spaces and proposed as park and gardens in the 2021 Master Plan.		Sabarmati Riverfront Development project of Ahmedabad city which was designed based on riverfronts of Thames in London and Seine in Paris. Past studies have made proposals for resolving the sewerage issues. These studies should be reviewed thoroughly, and short term and long term projects should be prioritized in the short and long range development plans for the city
		Strategies should be developed to recycling water at the source. If it is an industry, recycling strategies unique to the industry to be developed and incorporated on site. Only the recycled water to be allowed to drain into the river.	Management of Industrial Solid Waste (ISW) is not the responsibility of local bodies. Industries generating solid waste have to manage such waste by themselves as bulk generators and are required to seek authorizations from respective State Pollution Control Boards (SPCBs) under SWM Rules 2016 rules. However, through joint efforts of SPCBs, local bodies and the industries, a mechanism could be evolved for better management. ²
		For slums and local neighbourhoods, sustainable - water recycling and solid waste treatment systems to be installed.	Teams from Auroville and other regions where such practices have been successfully incorporated should be invited to develop the strategies into successful implementable projects.

² http://www.eai.in/ref/ae/wte/typ/clas/india_industrial_wastes.html

SL NO	ISSUES	STRATEGIES	RECOMMENDATIONS
		1 1	Sewage sludge and effluents from STPs can be disposed of on agricultural lands for irrigation/manure purposes.3 Diverting sewerage and drainage
			channels from entering the river. Penalty to be implemented to the Urban
			Mandatory rules for segregation of wastes to be implemented
	*		Initiatives like smart waste management landfills like the one in Kuberpur to be
=	Redefining the role of the River		promoted
	Major impact on the environment with	Rejuvenation, reclamation and restoration -	The Government of Uttar Pradesh is in the
	particularly the primary river in the	entire stretch from Delhi till Allahabad.	rejuvenate the State's water resources
	region, Yamuna is not a citywide	Re-look should be made on the importance and	including the Ganga river basin and its
	impact but a region wide impact which	requirement of the barrages that has been	tributaries in the interest of farmers,
	extends beyond the Taj Trapezium Zone. Eq. The YAP 1 documented that	constructed and are being planned to be constructed all across the river stretch.	industry, households and other water users.
	Yamuna begins its degeneration	All sewerage and drainage points opening to the	Under this scheme Restoration and
	process way up north. A small stretch	river should be mandatorily stopped and	Conservation of River Yamuna project
	of 22kms in the capital Region, Delhi,	alternative plans like reuse of grey and black	to be taken up. The Final Report on
	the river turns into a sewer. To address	water should be taken up.	Restoration and Conservation of River
	the precinct level issues of a dying -	Non-conforming activities and construction to be	Yamuna Submitted to the National Green
	river, which forms a main element of the heritage conservation vision plan	restricted or pronibited along river bank.	Iribunal 2013 needs to be initiated and implemented with immediate effect.
	for Taj Heritage conservation.	1	The UP Irrigation & Water Resources
	The river is managed separately in 6		Department is the nodal agency coordinating these different work streams
	segments divided by 5 major barrages		to rehabilitate rivers to initiate the process

³ http://www.eai.in/ref/ae/wte/typ/clas/india_urban_wastes.html

SP NO	ISSUES	STRATEGIES	RECOMMENDATIONS
	As each barrage holds up water and force downstream area to accumulate pollutant, the river now relies on monsoon water discharge by upstream barrages to dilute some pollution.		Strict zoning ordinances to be put in place for restricting pollution causing industries along the river or close to the heritage sites. • All guidelines of the Ministry of Water Resources, River Development and Ganga Rejuvenation • Guidelines for National Lake Conservation Plan 2018
		- Activities like visarjans during festivals, religious ceremonies along banks, washing, bathing, cremating etc. need to be strictly regulated.	Zoning ordinances established and fines to be imposed for all nonconforming activities along river banks
		- Industries to adopt waste minimization strategies	 Incentives to be provided to industries for adopting waste management strategies and waste minimization strategies
:=	Currently there are dhobi ghats, crematoriums, bathing ghats, defecation grounds along the river which play a vital role in its degeneration within the precinct area.	Zones to be defined with adequate infrastructure for accessing the river for activities like washing clothes, cremations and religious purposes.	 Establish zoning ordinances to regulate restricted access to the river or allowing access only at certain points. Establishing zoning ordinance to prohibit conventional crematoriums along river banks. Electric crematoriums to replace the conventional crematoriums along banks or relocated.
≣	- Over the years, households, factories and farmlands has transformed the river into a sewage dump site and the backyard of the city. The river gradually became the confluence of untreated sewage canals instead of a connection	The river and heritage connect needs to be revived. Strategies to be developed to educate the local community of the rivers value and potential and to make them respect its presence. A major initiative of future urban planning strategies should be to ensure that the river is given a prominent place with respect to heritage zoning.	 Heritage zoning and conservation to include river. Reclaimed land given back to the river by constructing flood channels parallel to the river and deepening or widening the river.

SF	ISSUES	STRATEGIES	RECOMMENDATIONS
	between historical monuments and civic life. The reclaimed land that was originally proposed for Taj corridor in 2002-2003 is now a piece of useless land partially piled with garbage from an influent sewage canal further threatening the fragile hydrological environment of Yamuna River.4		
.≥	The river is dying and it is essential to revive it.	Strategies to revitalize the river to be adopted.	Eco friendly, proven, local, cost effective strategies for protecting the local natural system to be adopted. Artificial groundwater recharge programmes are not sustainable in the long run without the support of soil conservation measures and natural vegetation. Any kind of building structures to be strictly restricted along river bank. Three Manicured lawns to be restricted along river bank, since they increase erosion and water pollution due to runoff carrying fertilizers. Natural, biodiversity to be encouraged along banks. Parks with big trees and native plants to be developed along the water front. orchards along banks at regular intervals will help maintain a natural

⁴ Source: Rethinking Taj Heritage Corridor: A River as Historic Connection

community while help reducing the erosion and strengthening the barand restore the natural habitat aquatic wild life and migratory birds and restore the natural habitat aquatic wild life and migratory birds drift into the region from Bharatpur. Desilting and river deepening strateg to be developed to help revive the driver. Standards to be developed to help revive the driver. Standards to be developed to help revive the driver. Standards to be revised for connectivity to the river in form of stain pathways. Vegetation Management plan as particle varied kinds of connectivity to the river in form of stain pathways. Plans for reviving the dying banks of Yamuna parctice varied kinds of cottage industry villages to be prepty to adopting sections of the neighbourhor provides and becommit opportunities the local industries and mohallas' who is can be adequately reinstated. Jobs that were lost to environmental or jobs that were lost to environmental or some trade which provides and endequate the same trade which provides and berry industries are industries that have potential to grow in	SL NO	ISSUES	STRATEGIES	RECOMMENDATIONS
Regional equity and networking of economic opportunities Closure of polluting industries have local industries that exi9st in the darkerse effect on the income of the households that relied on those industries, resulting in lower quality of growth. Anybody visiting Agra does carry a packet of petha back home. Given growth. Anybody visiting Agra does carry a packet of petha back home. Given good working conditions, hygienic work spaces and adequate proncems can be adequately reinstated. There are entire 'bastis' and 'mohallas' who practice the same trade which provides opportunity to turn these bastis into craft villages. Plans for creating craft villages to be prep to adopting sections of the neighbourh adopting containing in lower quality of inthe tourism sector. Anybody visiting Agra does carry a packet of petha back home. Given good working conditions, hygienic work spaces and adequate provide ample economic opportunities infrastructure for local industries, tannery and foundry jobs that were lost to environmental concerns can be adequately reinstated. There are entire 'bastis' and 'mohallas' who practice the same trade which provides opportunity to turn these bastis into craft villages. Promote industries that have potential to grow in				economic benefit to the local community while help reducing the soil erosion and strengthening the banks, and restore the natural habitat of aquatic wild life and migratory birds that drift into the region from Bharatpur. Desilting and river deepening strategies to be developed to help revive the dying river. Standards to be revised for any connectivity to the river in form of stairs or pathways. Vegetation Management plan as part of urban revitalization plan to be put in place for reviving the dying banks of Yamuna.
verse effect on the income of useholds that relied on those traditional handicrafts, small scale cottage and useholds that relied on those traditional handicrafts, which have a good market in the tourism sector. - Anybody visiting Agra does carry a packet of petha back home. Given good working conditions, hygienic work spaces and adequate infrastructure for local industries, tannery and foundry jobs that were lost to environmental concerns can be adequately reinstated. - There are entire 'bastis' and 'mohallas' who practice the same trade which provides opportunity to turn these bastis into craft villages. - Plans for creating craft villages to be prep to adopting sections of the neighbourh to adopting sections of the neighbourh to adopting sections of the neighbourh to adopting sections of the neighbourh. Example community led craft villages in Banglad craft villages in the tourism sector. - Anybody visiting Agra does carry a packet of crafts like zardozi work and marble works have the potential to grow big provide ample economic opportunities are tourism scale industries and berry industries are tourist pullers. - Tasar industries and berry industries are provide ample conditions industries that have potential to grow in provide and perry industries are tourist pullages. - Tasar industries and berry industries are provide ample conditions in the tourism works have the potential to grow big provide ample conditions. - Tasar industries are tourism villages Tasar industries are provided and provided ample conditions Tasar industries are provided and perry industries are tourism villages Tasar industries are provi	=	Regional equity and networking of ec	onomic opportunities	
		Closure of polluting industries have had adverse effect on the income of the households that relied on those industries, resulting in lower quality of life and increase in poverty and slum growth.		

ō			
NO S	ISSUES	STRATEGIES	RECOMMENDATIONS
:=	Almost 90% of the home based cottage units work without proper ventilation in the work areas and inadequate waste disposal system.	Improve standard of work environment.	Capacity building for waste minimizing strategies, upgrade infrastructure ,
≡	Many of the tanneries and foundries have been closed down due to environmental concerns but it has resulted in abandoned mills, now used as illegal warehouses or encroached shelters which are not only eye sores next to heritage monuments but are also prone to inappropriate in fill development which have a tendency to turn into slum like settlements.	Regulations for controlling inappropriate In-fill development particularly at abandoned and vacant plots along the river.	These plots can be developed into riverfront parks and tourist hubs with more green space and less built structure. Standards to be laid to ensure visual integrity of heritage sites is maintained.
2	Defining growth trajectories and functional base	ional base	
_	Slum rehabilitation and relocation studies have been done for Agra that can be implemented.	The proposals of these studies should be reviewed and put in to action wherever appropriate and have a potential for successful implementation.	Conservation zoning should be implemented and all settlements within the conservation zones should be relocated to alternate locates with suitable housing, infrastructure and employment opportunities
:=	Slum development and squatter development has also resulted in obstruction in the Heritage and river connection.		Conservation zoning should adequately include the heritage and river connection.
≣	Most settlements within the precinct are unplanned, haphazard growths without any sense of regulation. They do not have adequate infrastructure and have a slum like structure.		Building permits should become more stringent. Building permit should not be issued for multi-story buildings or dense settlements if they cannot produce evidence of compost units and adequate

S S	ISSUES	STRATEGIES	RECOMMENDATIONS
			infrastructure particularly, roads, light, water supply, sewage and sanitation systems.
.≥	Most of the settlements within the immediate precinct are more than 20 years old. Some settlements are as old as Tai Mahal itself, since they	The Agra master plan has defined zones in the periphery for future development. The proposed landuse should be reviewed and adequate actions should be taken to reduce the density in the core.	A limit should be put to the number of people who can dwell in in these ancient dwelling units (URDPFI GUIDELINES 2014).
	developed during the Mughal period. Particularly settlements around the Agra fort still have the same streets,		These structures should be restored and reconstructed with upgraded infrastructures particularly sewage and
	same built structure but in utterly dilapidated state.		sanitation infrastructure. Good employment opportunities and low cost housing facilities with good
			amenities may k
			les:
			GUIDELINES ADDITIONAL CENTRAL ASSISTANCE TO STATES FOR SLUM
			DEVELOPMENT
			PPP Modal for Affordable Housing 2017 LOW COST SANITATION SCHEME
			(ILCS) Guidelines
>	- The major tourist movement is	- New expressway down south, is a potential area	Strategies may include decentralisation,
	within the precinct area. Most of the fourist footfalls limit to	for new development particularly for multifamily residential and for new resorts and hotels	particularly the tourist population and
	the Taj Mahal and the Agra fort.	The highway will form a second gateway to Agra	Creating more tourist attractive circuits
	- Most trips are day trips and most of	and has been planned with good connectivity	in different parts of the city to distribute the
	the hotels and Restaurants are also	with the core.	tourist footfalls throughout the city instead
	- This adds to the traffic and	•	New hotels and restaurant should be
	congestion in the precinct zone		restricted in the core and encourage in
	since it also houses most of the residents of Agra.		other parts of the city. (URDPFI GUIDELINES 2014)

SL NO	ISSUES	STRATEGIES	RECOMMENDATIONS
·>	- Open areas are encroached by squatters or treated as defecation grounds.	Strategies to restore open areas, green and recreational places. Strategies to give designated areas for squatters/marginal workers/migrants Provide infrastructural facilities for them	Land demarcated for parks and recreational purpose in the Master Plan of 2023 needs to be converted for the same use. Land available from old dilapidated structures and sick industrial areas can also be used for open spaces and recreational green areas Low cost housing units or night shelters as per URDPFI Guidelines 2014 to be developed to relocate or rehabilitate existing squatters. 100% toilet facility to each night shelter / rental housing facilities Public Toilets provision Policies and Guidelines: Guidelines Night Shelter for Urban Shelter less Shelter and Sanitation Facilities for The Footpath Dwellers in Urban Areas 1992 Report of The Working Group On Migration
	;		2017
>	Assessing and incorporating future in	Assessing and incorporating future infrastructure (physical and social) needs	
_	cential invite poor migrants to ost of who settle down in the snse slums in the hopes of ployment opportunities but	Agra Master plan has proposed new development down south which might reduce some of the pressure from the core.	New employment opportunities in the periphery is essential for the cities health. A congested heart will fail the cities healthy growth. It is important to free the pressure
	eventually press the cities infrastructure particularly the core beyond its capacity.		from the core and spread it in the peripheral new growth zones since the infrastructure in the core has reached its limit and cannot support more growth.

SL	ISSUES	STRATEGIES	RECOMMENDATIONS
			Being a heritage city where most of the heritage sites are spread out in the core, high rise is not permissible in the core. Denser growth and high rise development zones should be taken to the peripheral zones of the city.
=	 A significant percent of 43% of the households do not have access to drinking water and are dependent on public water taps, tube wells, open wells, hand pump and water tanker. The ground water quality of Agra is naturally saline and requires additional purification. The current water purification system fails to purify the water adequately and people have to either buy water or survive on the salty water. Also, water table is declining 30-55 cm/year. 	- Water conservation strategies to be adopted Strategies to improve water supply should be developed. Agra was historically deficient of water Strategies should be developed for water harvesting and increasing the forest cover in the region to invite more rains and lesser dry spells.	New smart water treatment plants to be proposed to address water quality issues. Alternative sources of water to be drawn as per the Master Plan on Water Supply System for the city. River water not to be used. Decentralised water management plan needs to be development for the settlements within the Taj precinct and put into action. Rainwater Harvesting systems to be adopted. Closure of wells, hand-pumps and borewells in the area.
≣	 Sewage connections are devoid of proper house connection. Most of the sewage goes into the open drains. The STP at Dhandupur in the precinct zone is underutilized. The area covered by the sewerage system is only 17 per cent. About 50 per cent of the sewerage system is not in working condition. 	Strategies should be developed to treat sewage on site.	A Decentralised Sewage management plan like the Decentralised Waste Water Treatment System (DEWAT System) needs to be developed and put into action. This will be more applicable to all settlements within the identified precinct area. Sewage recycling system should be developed and incorporated at source particularly in slums and industries.

S S	ISSUES	STRATEGIES	RECOMMENDATIONS
	 Treatment capacities being inadequate, results in discharge of untreated sewage into water bodies, particularly river Yamuna and other nallahs. 42% of slum dwellers practice open defecation. Though 79% of the slums have some kind of sewerage facilities, they are inadequate and inefficient. 		
<u>.≥</u>	There is a huge housing shortage in the precinct area particularly the slums. About 56% population of Agra lives in Slums. About a 3rd of them are in the Precinct area. More than 3% of Agra slum dwellers reside in Tajganj only. Majority of the slums in the precinct area are more than 20 years old with outdated infrastructure. The lack of housing and basic services at the required pace to meet the challenges of urbanization has resulted in the development of slums and squatter settlements with wider ramifications on the health, safety and wellbeing of the citizens. Even though 94% of the total houses are Pucca in nature, most of them are found to be in dilapidated condition.	Strategies developed to relocate and rehabilitate slums with low cost housing schemes and adequate physical/social infrastructure	Identify rehabilitation and relocation of slum projects from existing DPRs for implementation
>	All slums are prone to flooding. Around 144 slums to be flood prone with rainwater remnant for 15-30 days.	Strategies should be developed to relocate all settlements on the flood plain.	 Growth beyond capacity in the core should be restricted. Flood water should be channelized.

S S	ISSUES	STRATEGIES	RECOMMENDATIONS
	Moreover, the duration of water logging is found to be more than a month in 2 slums, indicating lack of safety to the slum dwellers. ⁵	- Developments on the flood plain should be - limited to parks or vegetation based - developments.	Storm water system to be upgraded. Flood Mitigation Plans to be implemented
	98% of the slums have street lighting facilities, not all of which are in working condition and found to be insufficient. For the 2% of the slums do not have street lighting facilities, hence it is essential to increase the number of street light to prevent accidents and other inconvenience	Strategies to improve the local internal streets and street lighting.	Assess the existing street lights and identify areas for upgrade. Solar Street Lights Project to be initiated
	Animals on the road not only increase congestion but also cause dirt and filth on the roads.	Developing strategies to move cows, buffalos and other animals from the streets. Animal shelters to be developed in the urban rural zones.	Plans for creating Animal Pounds in the city like as been developed in Lucknow Municipal Corporation
> ≡	Multi-nodal urban structure and public places and movement patterns Festive season and holidays result in greater congestion and pollution in the core and precinct in peak tourist secore.	Strategies to be developed to ease congestion in the core and precinct in peak tourist seasons	Mobility plans should be proposed keeping in mind the tourist in flows on holidays and festive occasions. Special seasonal zoning ordinances may be developed to address the overflow of tourist in the precinct during holiday season. E.g. Street vending zones can follow regulations seasonal zoning. A zone may be marked vendor free during the peak tourist season and may resume street vending in off
=	Redefining the Image Structure		

⁵ RAY survey

SP	ISSUES	STRATEGIES	RECOMMENDATIONS
<u>-</u>	Many small heritage sites are lost among the slums due to codes that allow for protection of heritage sites of national and global importance only.	Strategies to be developed to protection and conservation of heritage sites not included in the heritage list of global and national significant	Heritage codes and conservation zoning codes may be reviewed and revised to ensure the protection of other heritage sites that have not received national and global importance.
:=	Entire public landscape is fragmented, with no means of getting from one park to another, and no deliberate connection with the river. Shahjahan Park lies deserted, fenced from the teeming street life of the city and neither opens onto the river, as does the cremation site and temple ghats next to the Taj. The historic monuments have thus become islands, representing vestiges of history cut off from the urban life around them.	Strategies to create connectivity between different heritage sites.	Develop connectivity to all heritage sites within the precinct with heritage walks and strips of greenways and river ways.
=	Step wells in the precinct have become garbage dumps.	Developing the riverfront for tourism and for enhancing the image of the city.	Codes to be revised for protecting step wells as protected heritage monuments. Step wells to be reused for their actual purpose of water harvesting.
>	Studies have found that about 7% of the population practices open defecation along railroads, drains and river banks. Not only has this ill habit affected environmentally and has health and sanitation ramifications, it produces a negative image of the city, particularly when Agra is a major tourist destination. The malodour and	It was only in 2013 that the Ministry of Urban Development issued an advisory note on septage management in urban India. As per this note, city sanitation plans, recommended by the National Urban Sanitation Policy, should be supplemented with a septage management sub-plan.	Awareness programs and sanitations programs to be strategized to discourage local dwellers from practicing defecation. Sanitation management systems upgraded as per studies conducted. Septage management plans to be made mandatory.

SP NO	ISSUES	STRATEGIES	RECOMMENDATIONS
	the filthy sites is a turn down for tourists when visiting heritage sites like chini ka roza, and other smaller heritage sites hidden among the many slums of the city.		Ensuring that growth is well distributed across the city and there is less pressure on the limited, infrastructure in the core.
. 5	ently, a drop in tourist numbers noticed in Agra which could have unted for the congestion in the or the restrictions in the tourist as a concern to protect Taj Mahal.	Strategies to be developed for creative city planning for promotion of tourism. Developing a good public image through integrated development strategies	Identifying and defining tourist circuits and providing those circuits with amenities and high grade public infrastructure facilities. Develop the local handicrafts and souvenir markets. Develop the image of the city to market the city as a tourist hub and not just the Taj Mahal. Develop the old mohallas around Agra fort as craft villages with tourist homestays with a Mughal era feel. Look beyond Taj while still keep it as the emblem for the city.

Annexure - Status of Ongoing Projects in River Yamuna

Cleaning of Rivers is a continuous process and the Central Govt. is supplementing the efforts of the States for pollution abatement of river Yamuna by providing financial assistance to Haryana, Delhi and Uttar Pradesh.

The details of ongoing projects are as given below:

Projects in Haryana

Panipat

- STP & Sewerage works in Panipat town
- Sanctioned cost Rs. 129.51 crore
- Construction of new STPs of 20 mld & 25 mld
- Rehabilitation of existing STPs of 35 mld & 10 mld
- Executing agency : Haryana PHED
- Project Status in Panipat –Completed

Sonepat

- STP & Sewerage works in Sonepat town
- Sanctioned cost Rs. 88.36 crore
- Construction of new STPs of 25 mld and
- Rehabilitation of existing STPs of 30 mld
- Executing agency: Haryana PHED
- Project Status in Sonepat Completed

Projects in Delhi

JICA assisted Yamuna Action Plan (YAP) Phase - III project in Delhi

- Sanctioned cost Rs. 1656 crore (85:15 cost sharing between GOI & GNCTD)
- Rehabilitation & Upgradation / construction of STPs upto tertiary level (BOD 10mg/l, TSS 10 mg/l or better) of 950 mld capacity in Kondli, Rithala and Okhla in Delhi
- Rehabilitation of 35.58m of Trunk sewer & Rising mains in Kondli & Rithala zones
- AA&ES for the said project (8 components) issued in May 2016 and March 2017
- Seven components (Pkg. K1, K2, R1a, R1b, R2, K4 & K3) costing Rs. 809.51 cr + Euro 0.32 crore awarded.
 - 3 Packages "K1", "R1a" & "K2" Costing Rs. 214.75 crore awarded to Srishti Infrastructure & Gypsum Structural India Ltd on 14/11/2017 & 06/02/2018
 - 1 Package "R2" (182 MLD STP) costing Rs. 208.18 crore+ Euro 0.21 crore awarded to M/s VA Tech Wabag Ltd on 08/05/2018
 - 2 Package "K4" & "R1b" costing Rs. 80.49 crore awarded to M/s Titupati Cement Products Ltd on 8/5/2018.

- 1 Package "K3" (45, 114, 45 MLD STPs) costing Rs. 306.09 crore+ Euro 1078364 awarded to M/s Triveni Engineers Ltd on 10/7/2018
- Remaining Pkg 'O' (564 mld STP) component of YAP-III is under bidding stage

Maily Se Nirmal Yamuna Revitalization Plan 2017, Phase-I, Delhi

- Sanctioned cost Rs. 344.81 crore (70:30 cost sharing between GOI & GNCTD)
- Command area of Najafgarh Drain (Dhansa to Keshopur) in Delhi
- Construction of 7 STPs of 94 mld with SPS & peripheral sewerage network
- Release of Rs. 45.2 crore on 19/07/2017

Projects in Uttar Pradesh

Mathura

- Rehabilitation/Renovation of Mathura sewerage scheme
- Implementation under hybrid annuity based PPP model
- Works awarded to Triveni Engineering under <u>HAM based PPP basis @ Rs.</u>
 437.95 Crs.
- 20 MLD of treated sewage shall be supplied to IOCL for reuse. IOCL shall bear the O&M charges for tertiary treatment and also pay fixed charges to purchase the treated sewage.

Vrindavan

- Rehabilitation of Sewerage Infrastructure and Augmentation / Upgradation of STP at Vrindavan (Mathura)
- Sanctioned Cost Rs. 33.81 crore
- Works under bidding stage (under tech. evaluation)

Agra

- DPR of Agra Sewerage Infrastructure Project is under consideration of NMCG.
- STP capacity 98 MLD
- Tapping of remaining nallah.



This report is property of SPA New Delhi and should not be shared without prior approval.



School of Planning, and Architecture New Delhi

योजना तथा वास्तुकला विद्यालय नई दिली

School of Planning and Architecture, New Delhi 4-Block B, Indaprastha Estate, New Delhi - 110002 Tel: +91 011 - 2370 2375 , 2370 2376 www.spa.ac.in