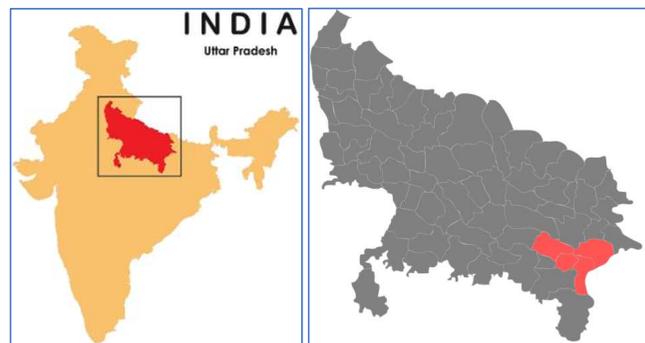


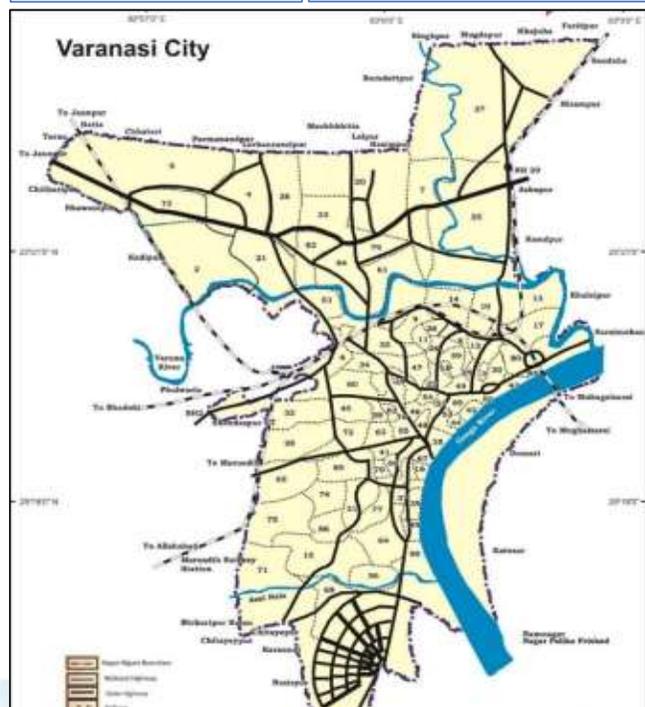
*Urbanism to Riverine Planning Strategy
for Climate Resilient Cosmic Sacred City in India*

Varanasi

Dr. Bikram Kumar Dutta and Dr. Sanhita Bandyopadhyay

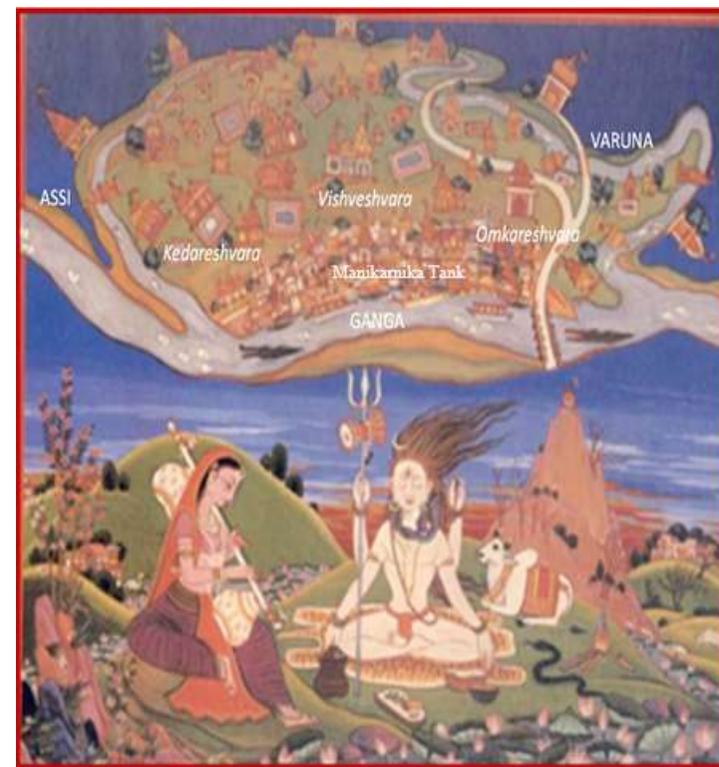


- Varanasi is between two rivers Varana & Assi in Uttar Pradesh

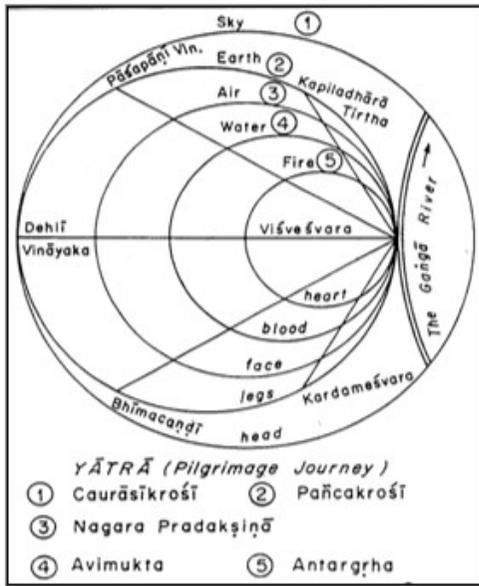


- The “sacred city” of India is recognized as the “most ancient continuously living city of the world”

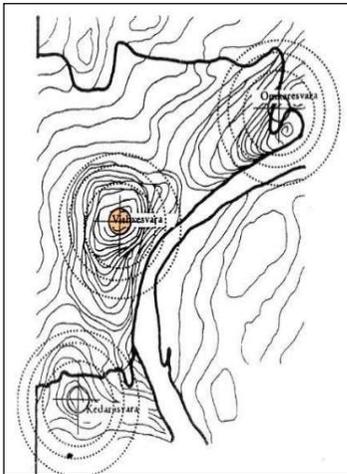
- Varanasi traces its origin to Anandvana, the forest of bliss where Lord Shiva sits in a yogic posture with his eyes closed listening intently to his wife goddess Parvati playing the instrument *veena*.



Varanasi: Origin

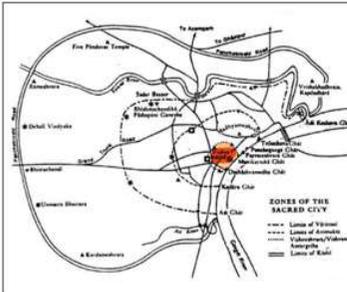


- Lord Shiva strikes his trident to hold the city and place it beyond the ravages of time.

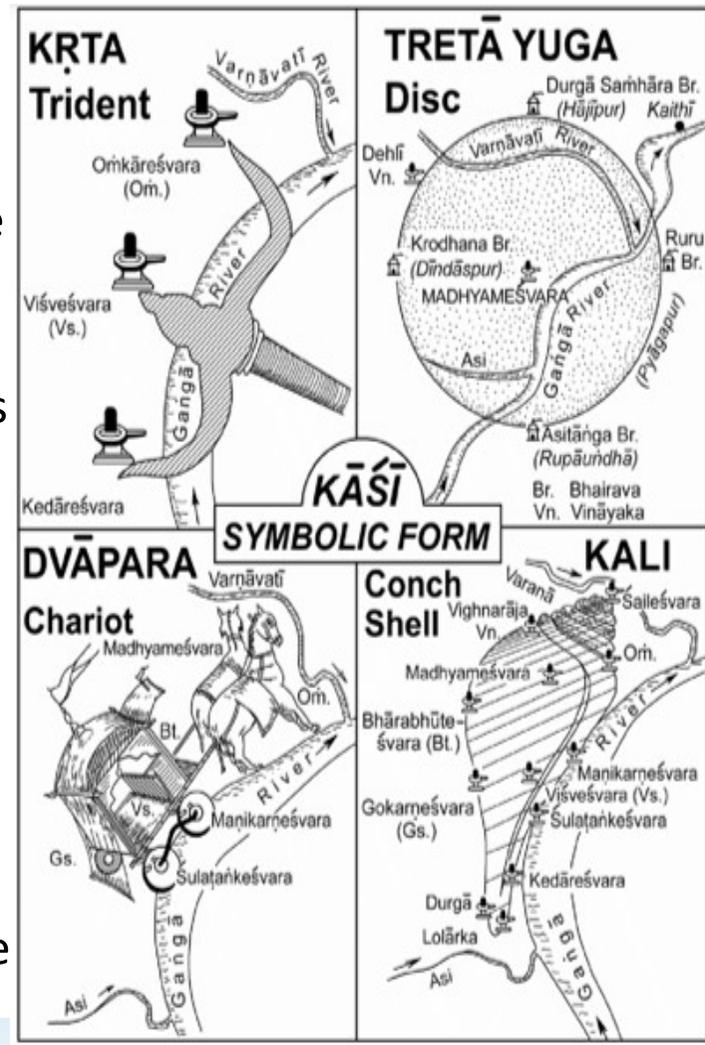
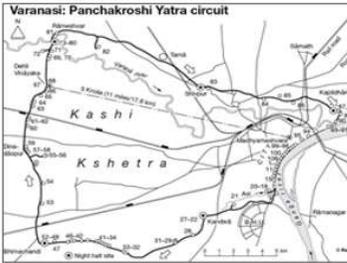


power rising through the lotus chakras in Shiva's spine and 'Assi' & 'Varana' are water channels intermingling with liquid power.

- The west bank is visualized as the spine of the primordial *purusha*- man.



- The Ganga is conceived as the **kundalini**



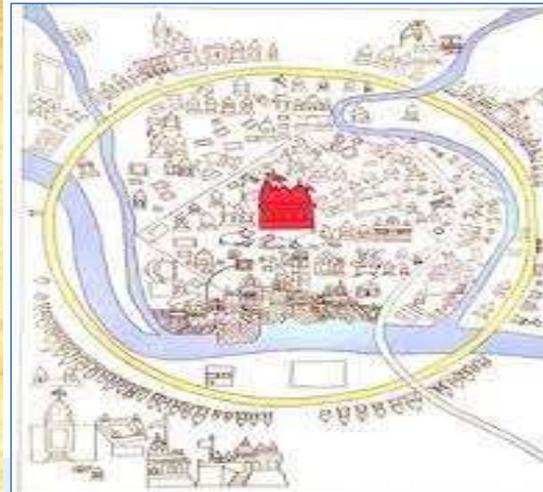
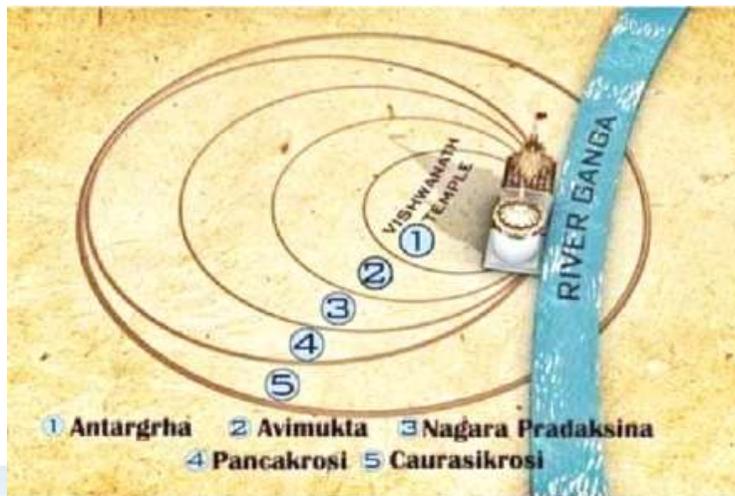
- Shiva creates **Kashi** i.e., *kash* symbolises elliptical shape



Varanasi: a Cosmic City

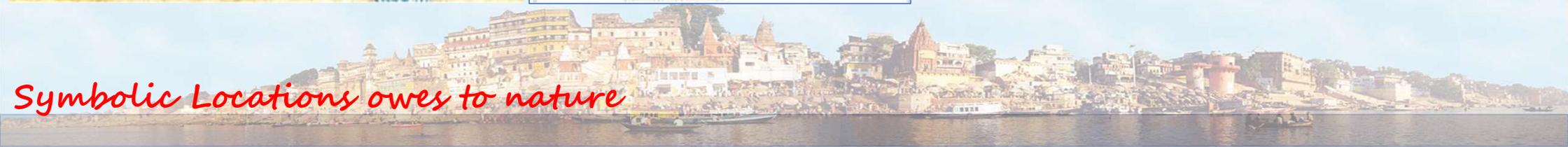
Cosmic Pilgrim Circuit in Varanasi

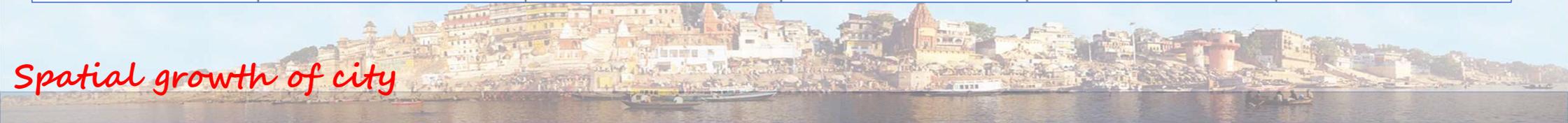
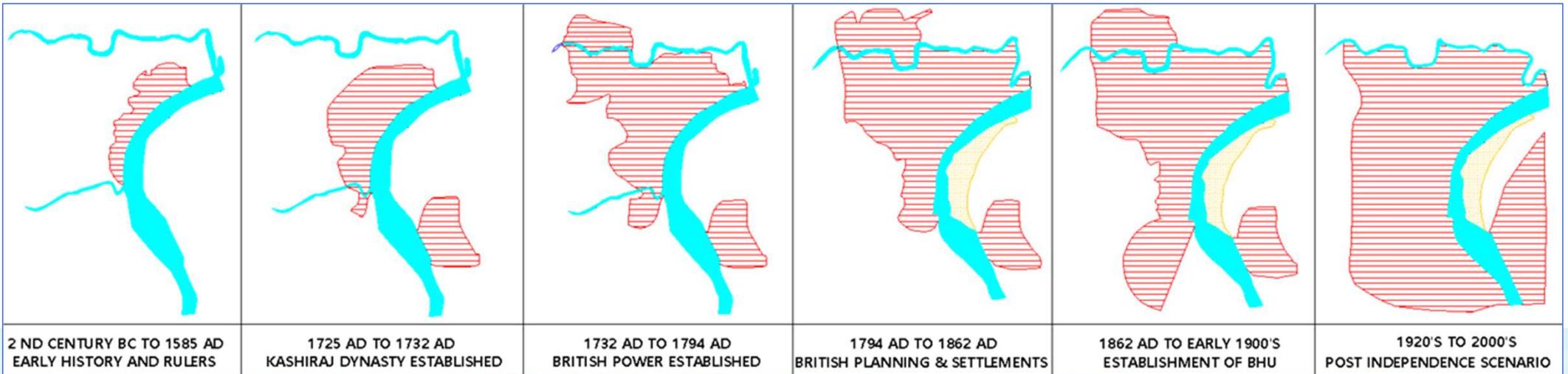
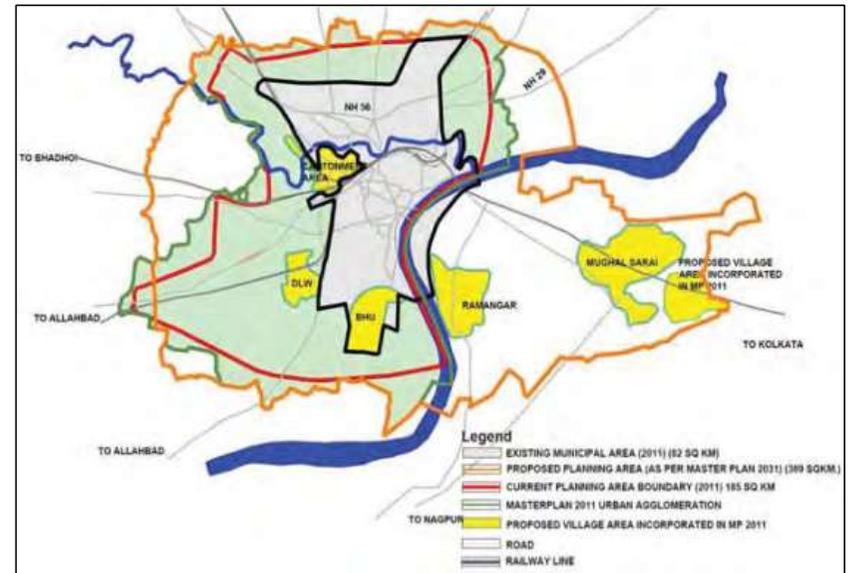
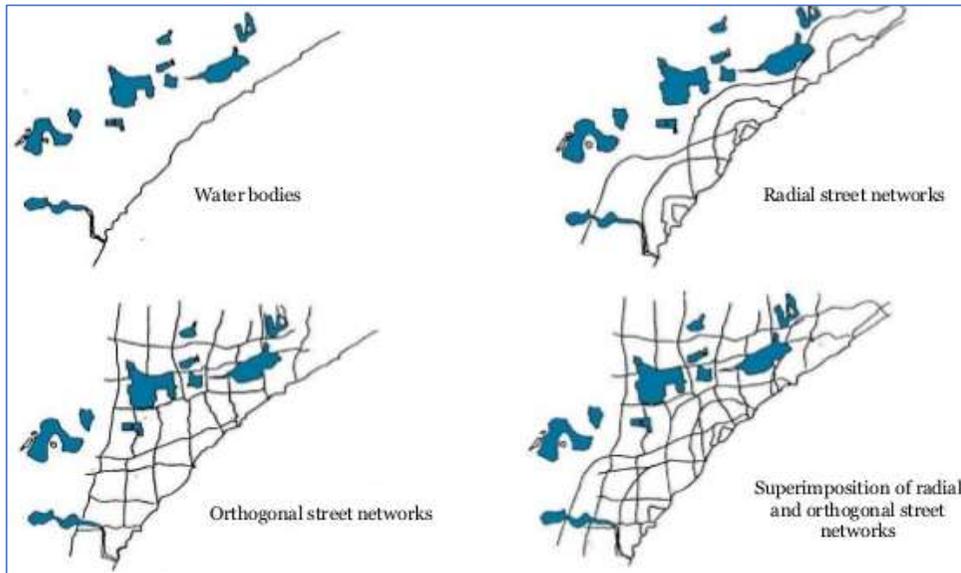
Macro cosmos elements	Mesocosmos sacred Route	Microcosmos Divine Body	Transcendental power	Sheath	Number of Shrines (Planets x Direction x Part of Body)
Sky	Caurashikrosi	Head	Consciousness	Mind	144 (9x8x2)
Earth	Panchakrosi	Legs	Action	Legs	108 (9x4x3)
Air	Nagar Pradakshina	Face	Cognition	Breath	72 (9x4x2)
Water	Avimukta	Blood	Wisdom	Intellect	72 (9x4x2)
Fire	Antargriha	Heart	Bliss	Bliss	72 (9x4x2)



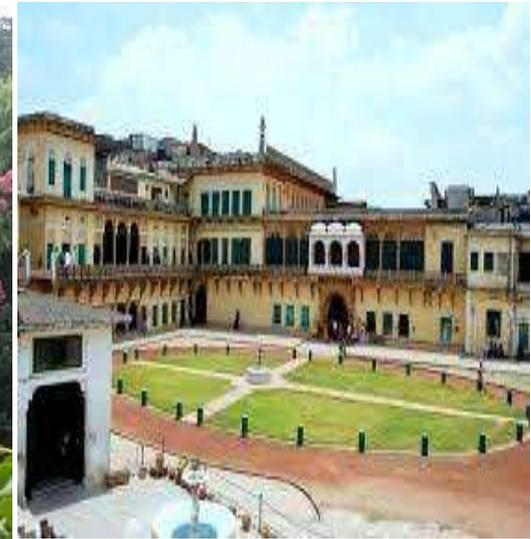
- The **cultural land-scape** of this interface ghats (steps and landings) lined by temples and other public buildings, pavilions, kundas (tanks), streets and plazas is layered and kinetic, and **responsive to the river's flow**.
- The **city** was developed in the **square and circle combination**. The square includes mostly temples and the circle act as the circumambulatory path around the temples.
- Further the expansion of the city started outside the square towards the panchkrosi route.
- **Five circumambulatory circuits**—Kashi, Varanasi, Avimukta, Antargriha, and Vishvanath—are traced in pilgrim yatras. They all begin and end with a bath at Manikarnika Ghat. The five sacred routes are also associated with the symbols of divine body, transcendental power and sheath.

Symbolic Locations owes to nature

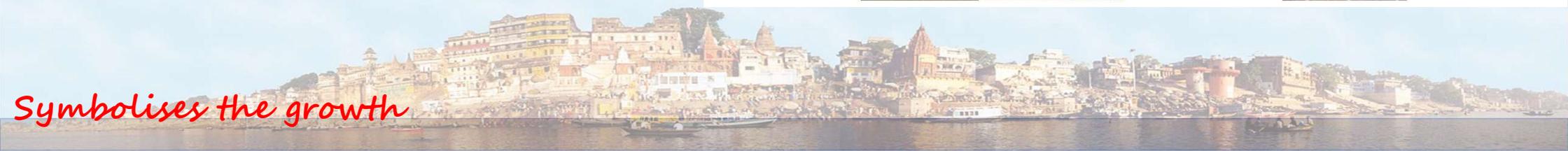
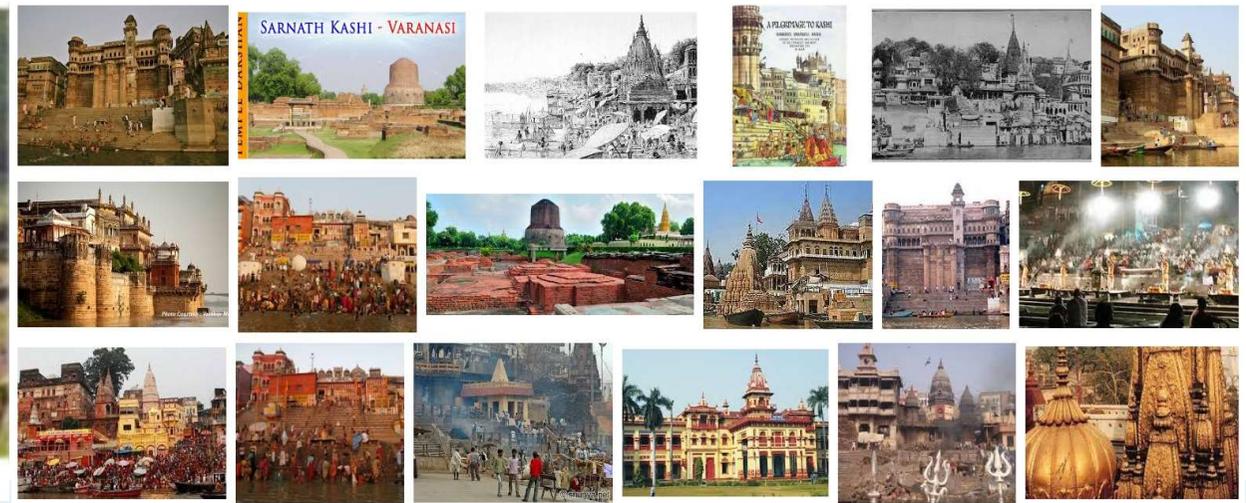




Spatial growth of city

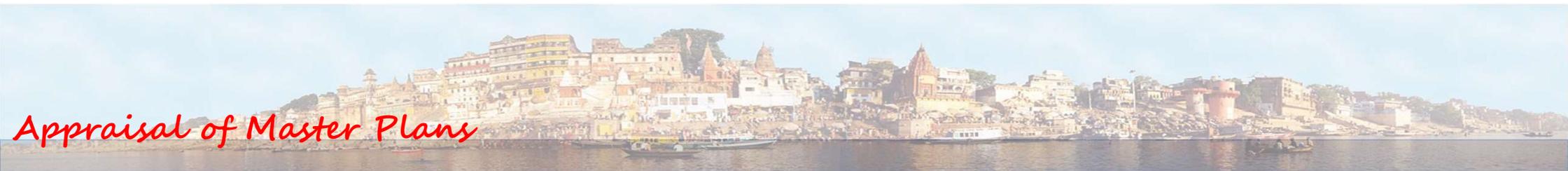


Remain of Aryan settlements in rajghat region in Kashi



Symbolises the growth

S. No	Land-use Category	1988		MP (I) -1999		MP (II) -2011		MP (III)-2031		% Changes in Master plan area	
		Area Km ²	%	Area Km ²	%	Area Km ²	%	Area Km ²	% area	(I-II)	(I-II)
1	Residential	26.1564	46.16	54.5724	37.65	92.5461	51.62	98.8654	40	108.64	69.58
2	Mixed landuse							7.5983	3		
3	Commercial	1.7608	3.11	4.7510	3.28	6.1823	3.45	10.9954	4	169.82	30.13
4	Industrial	1.9531	3.45	9.8137	6.77	6.5619	3.66	5.1556	2	402.47	-33.14
5	Public and Community Facility	2.6105	4.61	4.5042	3.11	13.0907	7.30	23.3933	9	72.54	190.63
6	Recreation (Park and Open Ground)	0.5304	0.94	27.0576	18.67	9.4847	5.49	46.527	19	50.0136	64.95
7	Service and Utilities					1.0397	0.58	1.412	1		
8	Govt. & Semi Government	0.5669	1.00	2.9218	2.01	14.3315	7.99	5.0334	2	415.40	390.50
9	Tourism & Heritage Zone					4.2373	2.37	0.924	0.14		
10	Transport and Communication	9.1430	16.13	13.0027	8.97	14.6035	8.15	34.425	14	42.21	12.31
11	Other (agriculture & open space)	13.9379	24.60	28.3206	19.54	16.8345	9.39	5.7105	2	103.19	-40.56
	Total Area	56.6590	100	144.9440	100	178.9122	100	246.4599	100	155.82	23.44



Appraisal of Master Plans

Population Growth of Varanasi: 1971 to 2031
Source: Census of India, *Master Plan Estimation

Varanasi Development Region as in the Master Plan 2011 - 2031

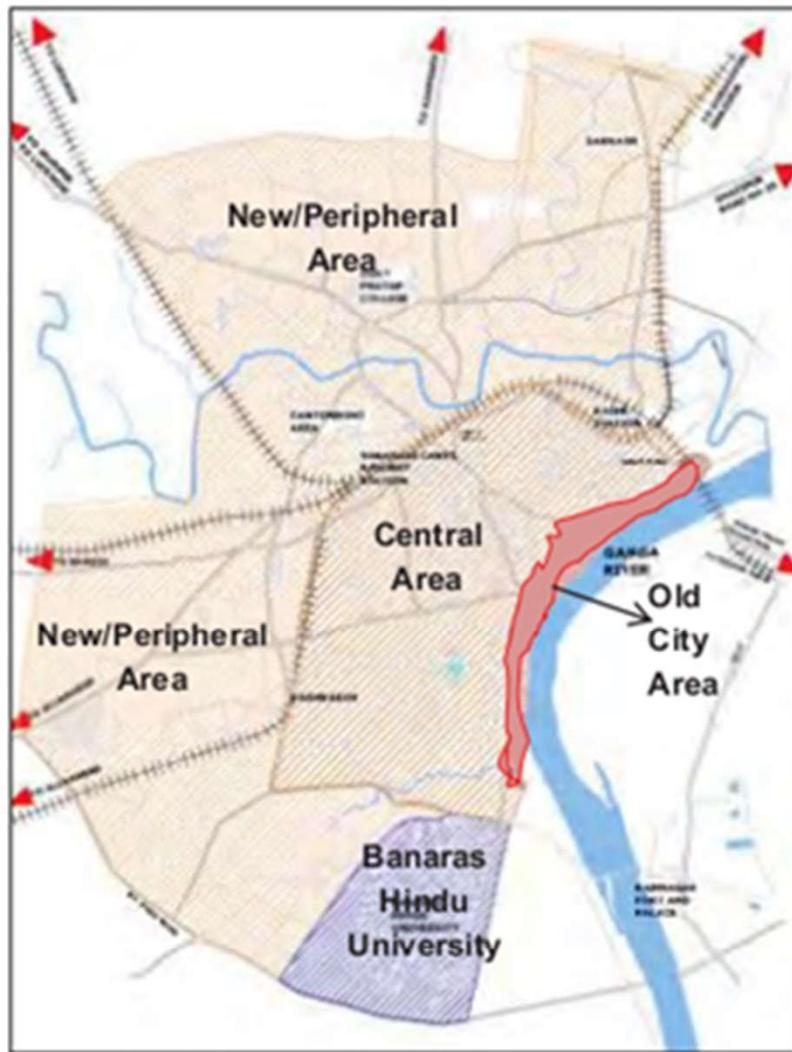


Unit/ Year	1931	1941	1951	1961	1971	1981
Municipal area (MCV)	207,650	266,002	355,771	489,864	671,934	773,865
Urban area Addition						
VUA (Varanasi Urban area Agglomeration)						
Decadal Growth , VUA%						

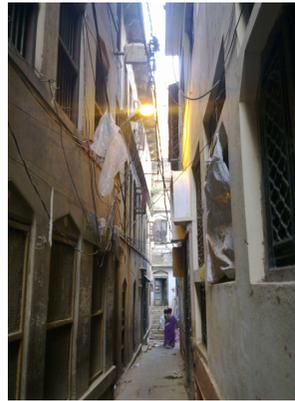
Unit/ Year	1991	2001	2011	2021*	2031*
Municipal area (MCV)	929,270	10,103,951	1,367,278	1,640,216	1,835,197
Urban area Addition	101,593	107798	205,558	344,502	511,962
VUA (Varanasi Urban area Agglomeration)	1,030,863	1,211,749	1,572,836	1,984,718	2,347,159
Decadal Growth , VUA%	29.48	17.55	29.80	26.19	18.29



Appraisal of Master Plans



- **The Core or Old City** consisting of the Ghat area including Chauk, Kotwali, Adampura, etc.,
- **The Central City** comprising of the area beyond the old city and bound by NH-2 or 19 now along the western and northern edge.
- **Peripheral area** comprising of the trans Varuna area.



Urban Setting





Ganga Aarti at Dashashwamedha Ghat



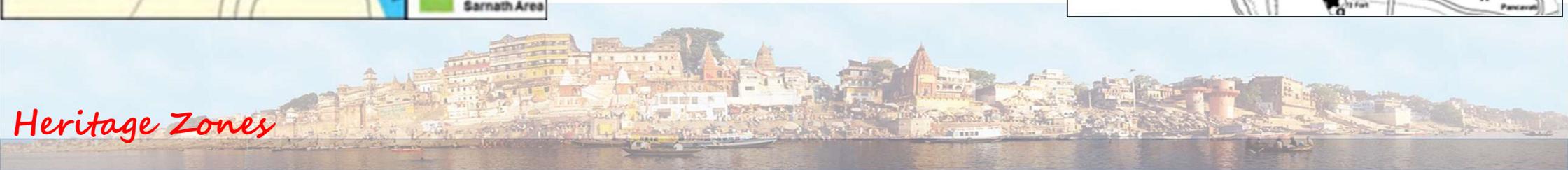
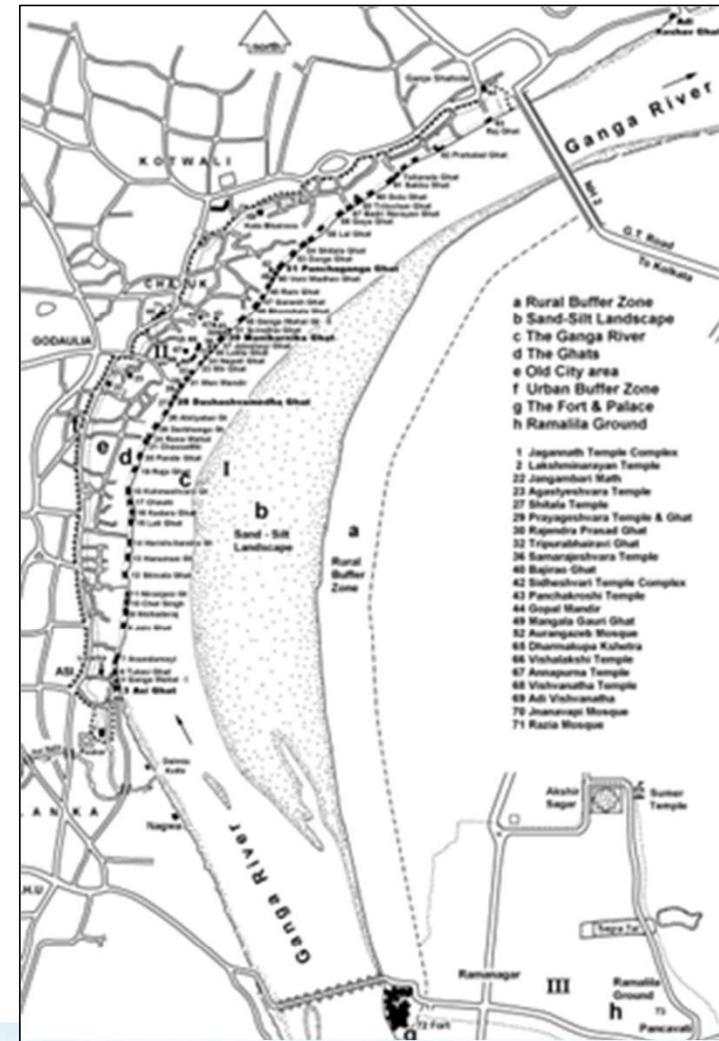
Maha Shmshana - Manikarnika Ghat



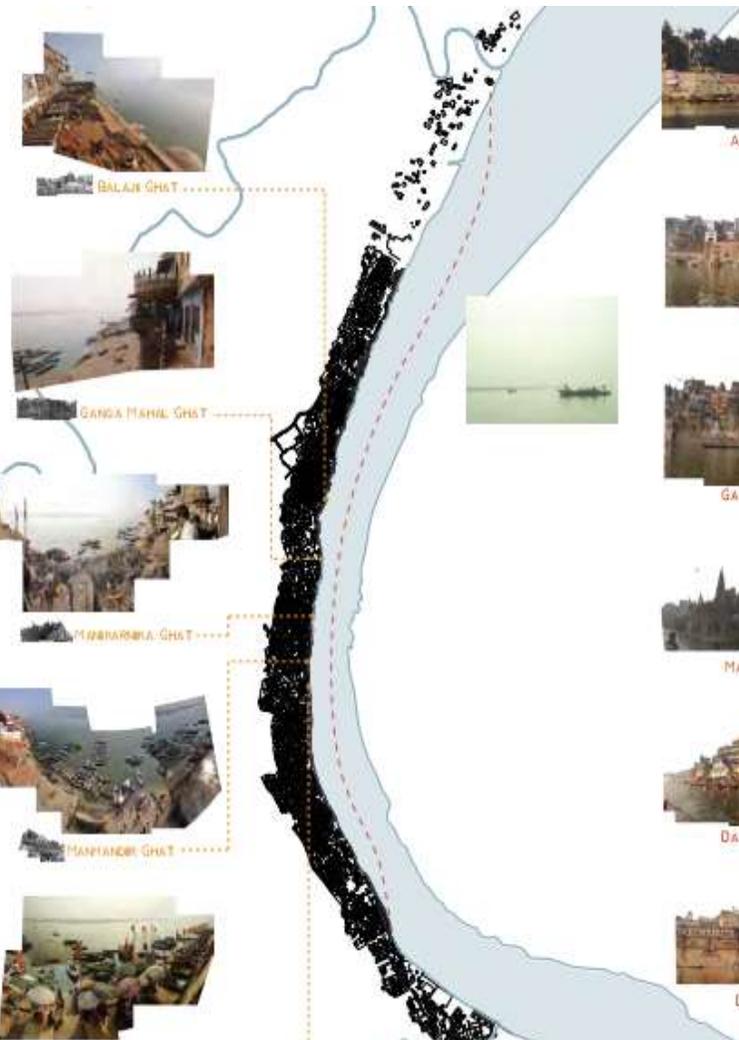
Festival in Varanasi



Temples



Heritage Zones



ADIKESHAB GHAT



BALAJI GHAT



GANGA MAHAL GHAT



MANIKARNIKA GHAT



DASASHWAHED GHAT



DIGHPATIYA GHAT



Glimpse of Life and Sheath



MANIKARNIKA IN 1922



MANIKARNIKA IN 1947



MANIKARNIKA IN 2014



CREMATION WATCHED BY BYPASSERS LACKS PRIVACY



PACKED WOODS BLOCKING THE STREETS



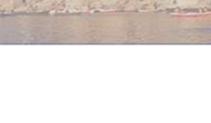
BODY IS WASHED AND DRESSED. SANDALWOODS PASTE IS APPLIED TO PREVENT DECAYING



PILE OF ASH BEING IMMERSIED INTO THE RIVER



AFTER PASSING THE TEMPLE, BODY IS CARRIED TO THE CREMATION AREA CARRIED BY THE BIER DECORATED WITH FLOWERS.



AFTER PUJA, BODY GETS PREPARED AND FINALLY GETS CREMATED.



APPROACH ROUTE TO MANIKARNIKA GHAT

ACCESS TO WATER TO WASH BIER

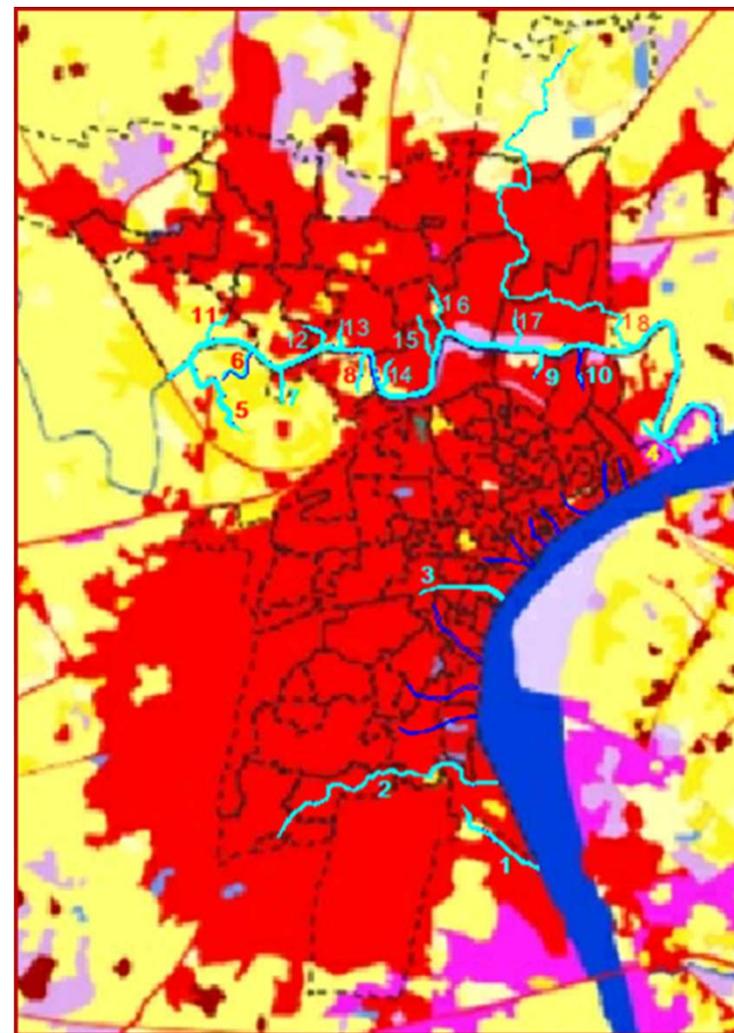
CREMATION GROUNDS

TEMPLE

Source: Ghats of Varanasi

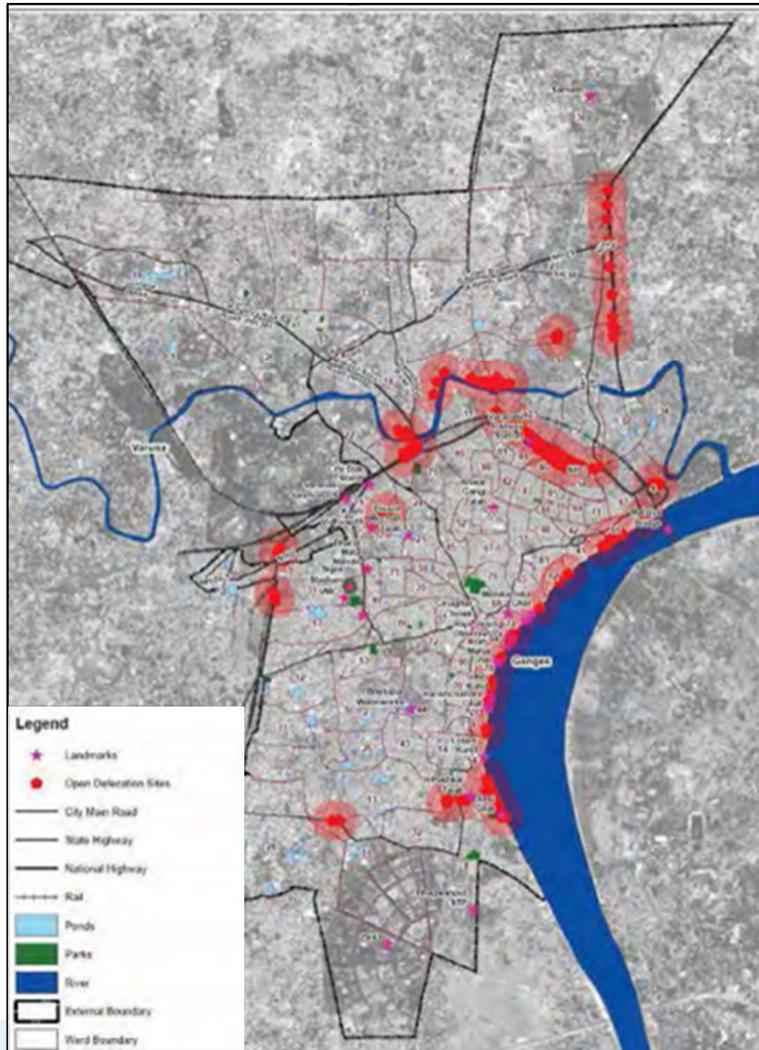
Source: Ghats of Varanasi

S. No.	Name of Channel/ Drain	Point of Discharge	Condition
1.	Nakki	Ganaga River	Dry
2.	Assi Drain	Ganaga River	Carrying Sewage
3.	Telia	Ganaga River	Intercepted at sewer Line
4.	Bhainsasur	Ganaga River	Intercepted in sewer Line
5.	Phuwaria	Varana River (Right bank)	Storm water drain
6.	Sadar Bazar	Varana River (Right bank)	Storm water drain
7.	Raja Bazar	Varana River (Right bank)	Storm water drain
8.	Teliabagh	Varana River (Right bank)	Storm water drain
9.	Nakhi Ghat	Varana River (Right bank)	Storm water drain
10.	Konia bypass	Varana River (Right bank)	Storm water drain
11.	Central Jail Nala	Varana River (Left bank)	Storm water drain
12.	Orderly Bazar	Varana River (Left bank)	Storm water drain
13.	Chamrautia	Varana River (Left bank)	Storm water drain
14.	Khajuri Colony	Varana River (Left bank)	Storm water drain
15.	Banaras Drain No.5	Varana River (Left bank)	Storm water drain
16.	Hukulgang	Varana River (Left bank)	Storm water drain
17.	Nai Basti	Varana River (Left bank)	Storm water drain
18.	Narokhar	Varana River (Left bank)	Storm water drain



Natural Drainage Channels





Rejuvenate Assi Nallah: We Want a Clean Ganga, We Need to Start with the Nallahs'. At the origin point of the Assi drain, should decentralized and make biotic sewage treatment system.

Making room for river flood: Talabs, parks and the edges of the Ganga River are common public spaces in Varanasi. They are identified as potential maidans which can be transformed into seasonal, adaptable and resilient spaces to absorb the intensifying flux.

Chakra Tal as a Maidan

Beniya Park as a Maidan

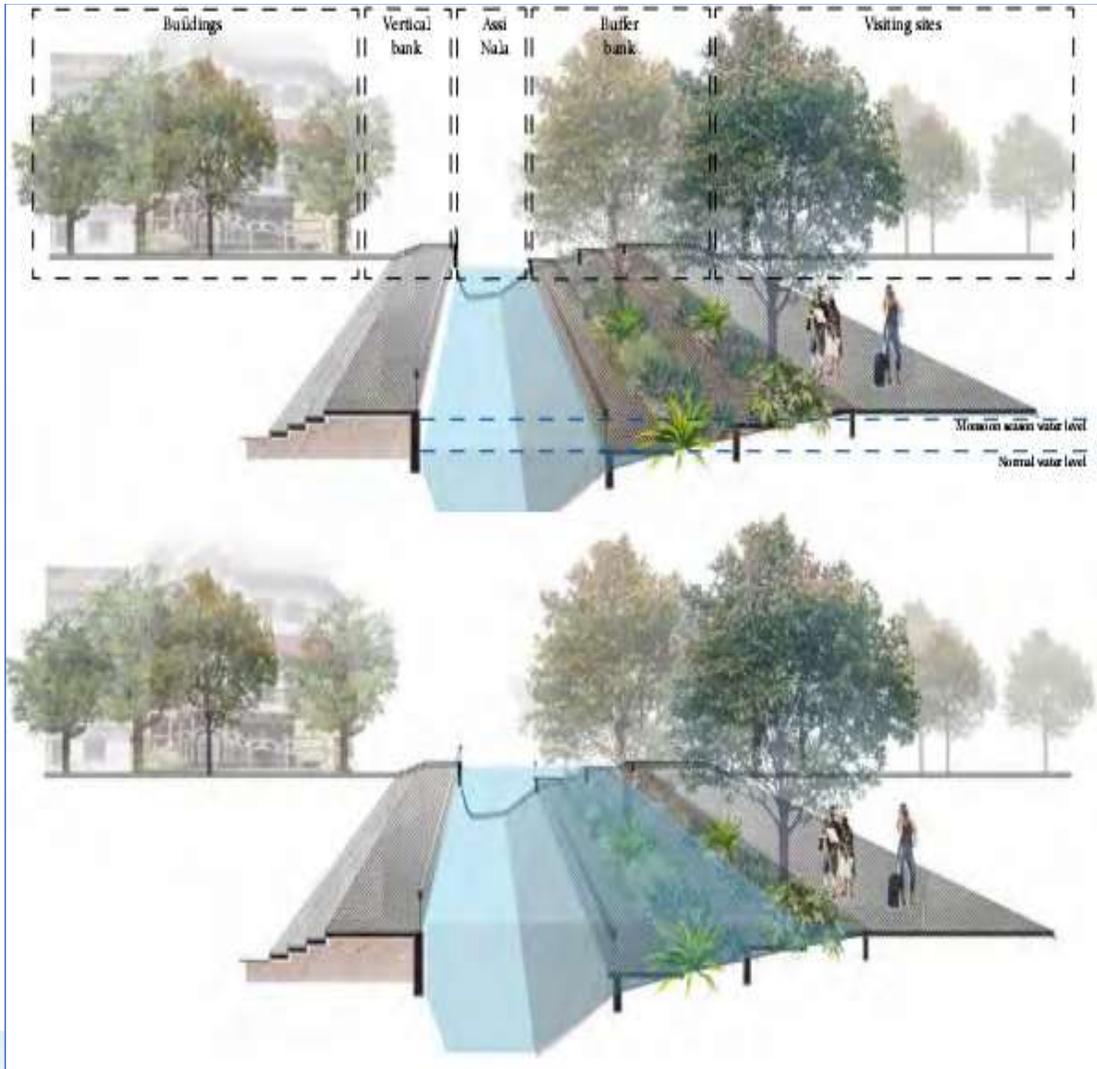
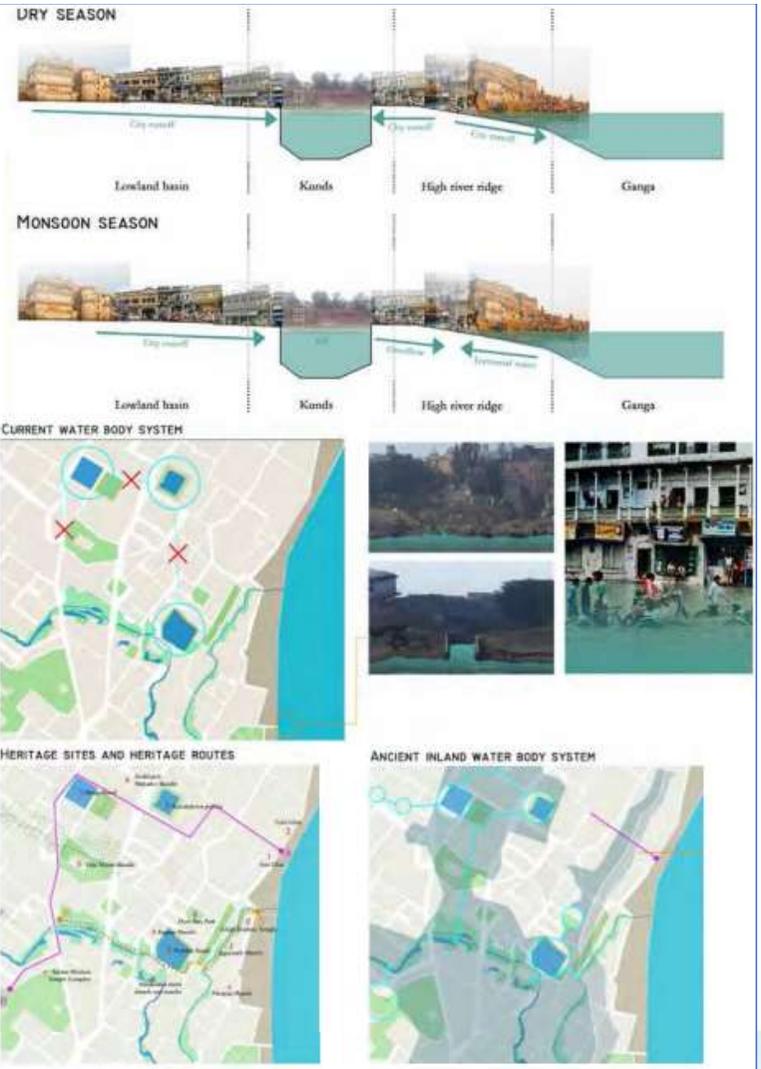
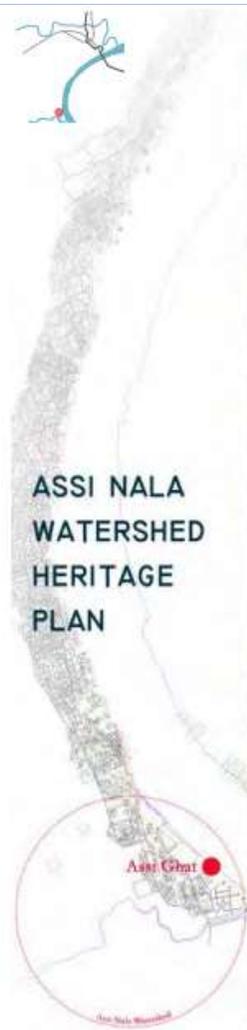
Dashashwamedh Ghat and the Sandbank as Maidans

Ganga Floodplain Urbanism: Fingers of high ground' may use for combination of soil from cut and fill operations and dredged river silt to build the fingers. This will be followed by an incremental building strategy on top of the fingers and the low-ground areas between the fingers will become capable of draining water to the river during monsoons while serving as ground for urban agriculture during the rest of the year

Varana River as an Entrance: create different ecological habitat areas as well as constructed wetlands that will help in bioremediation-wastewater treatment for the wastewater that is discharged by the buildings along the river.



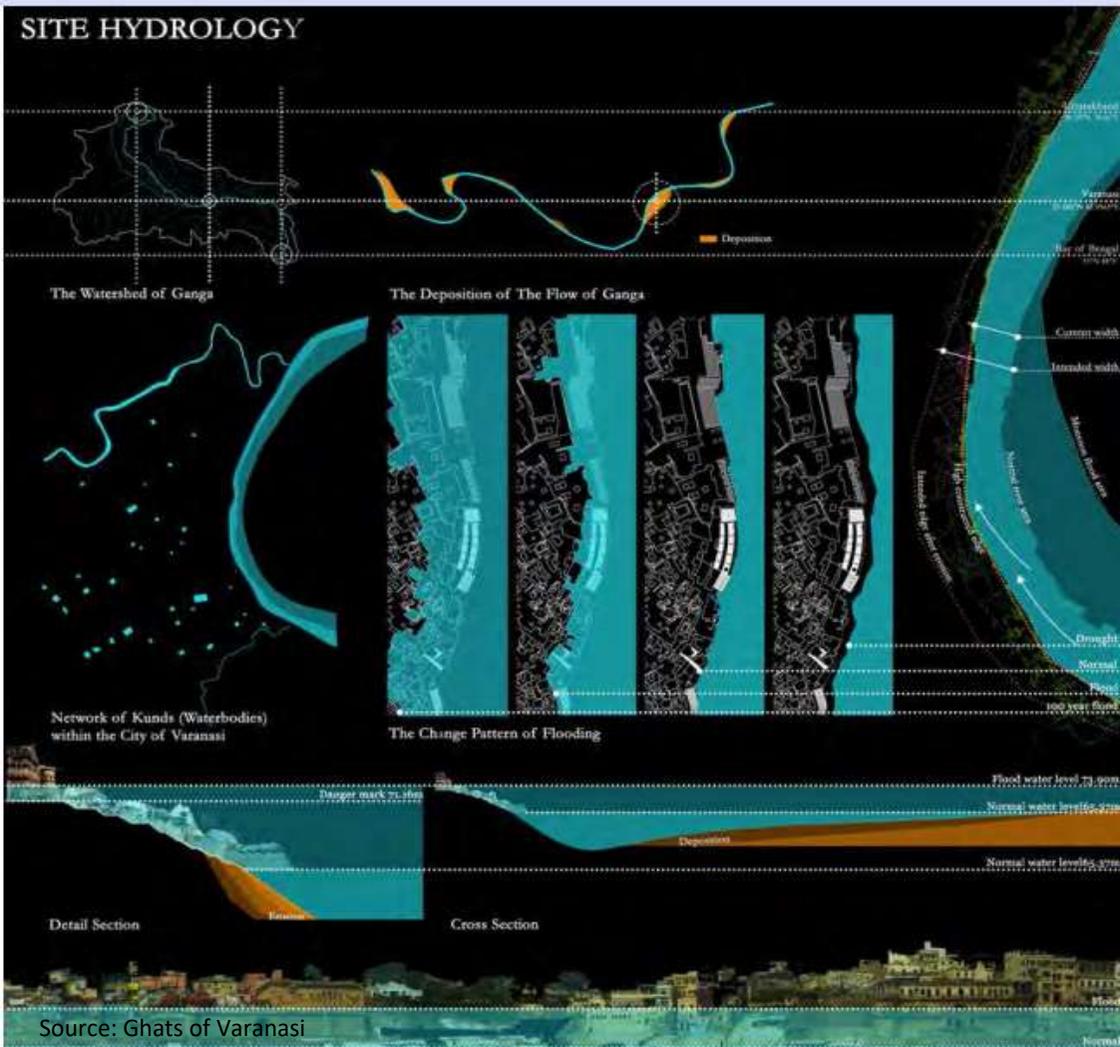
Riverine Strategy Plans



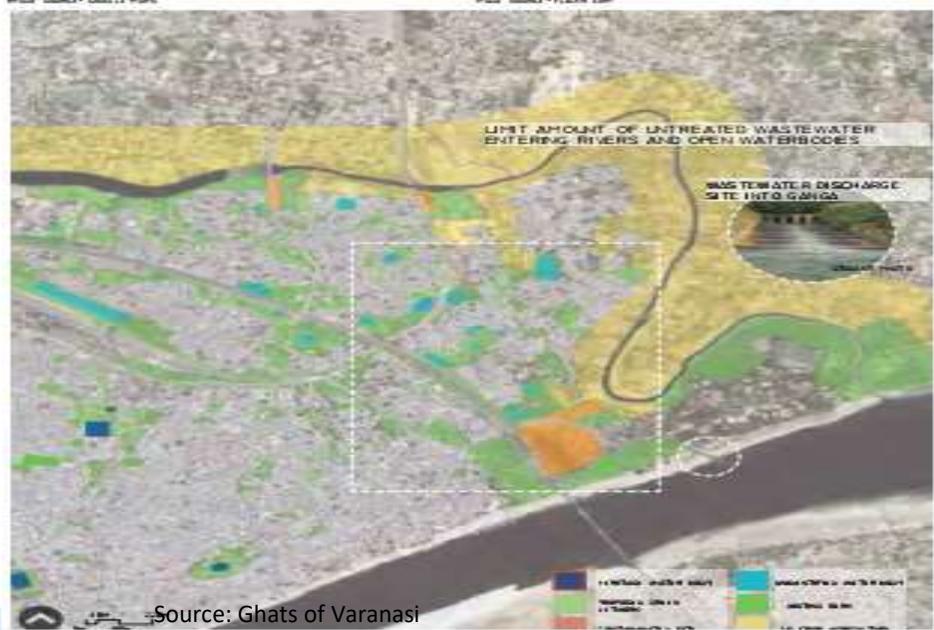
Source: Ghats of Varanasi

Rejuvenate Assi Nallah

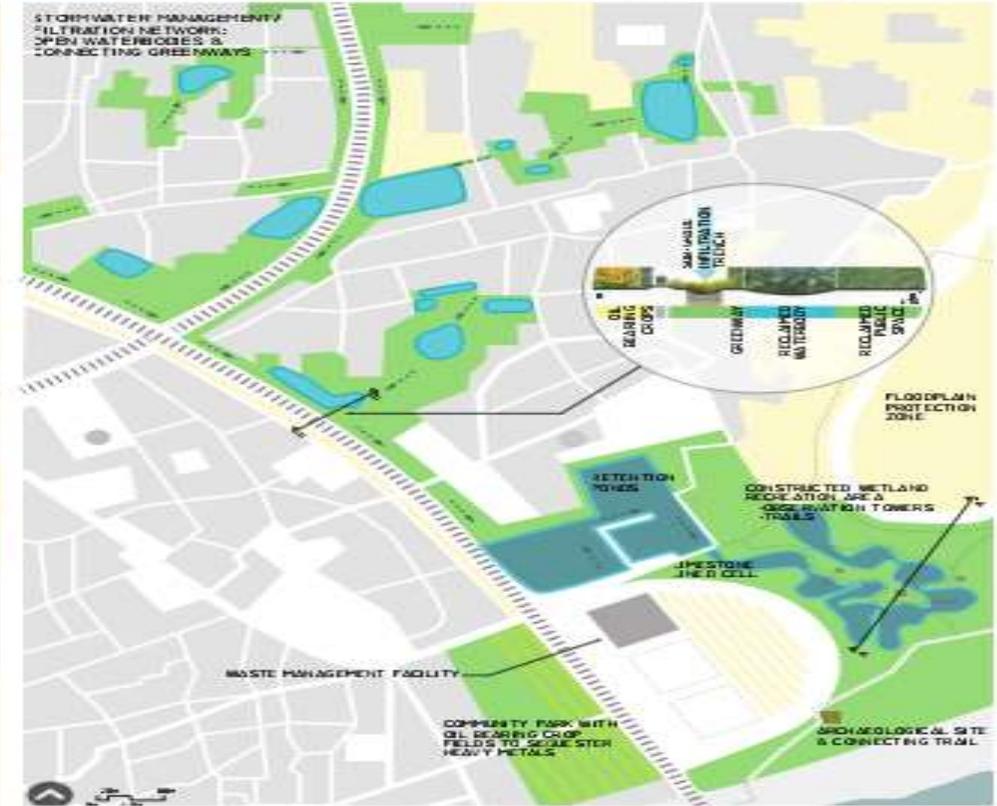




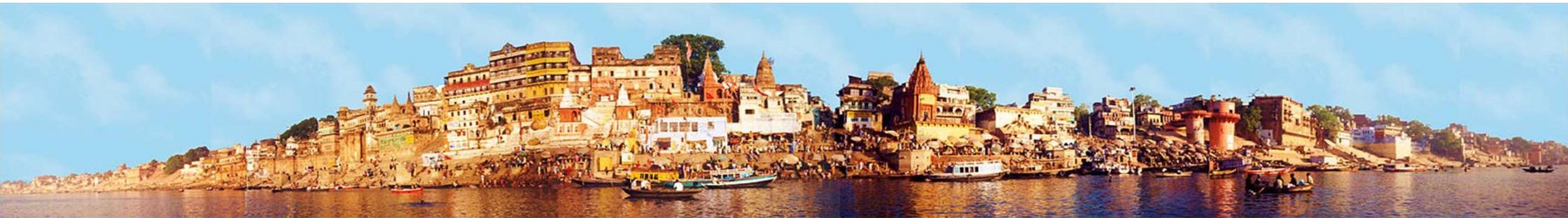
Making room for river flood.



Source: Ghats of Varanasi



Varana River as an Entrance



Thank you

