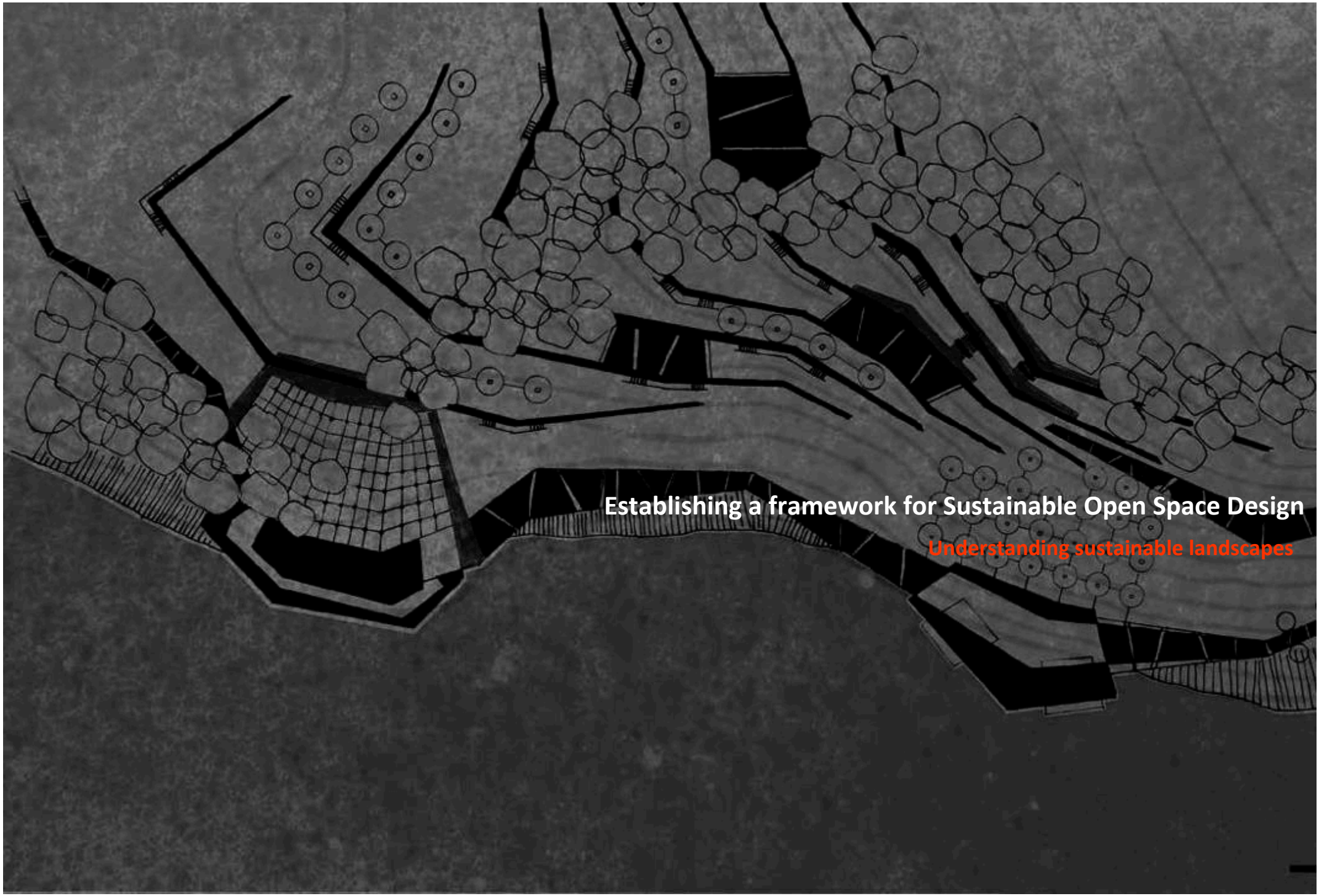
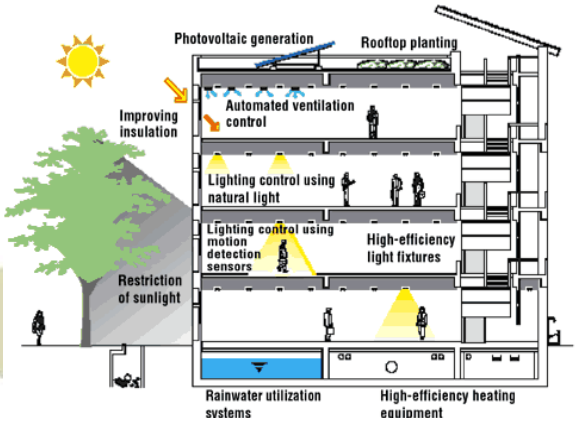
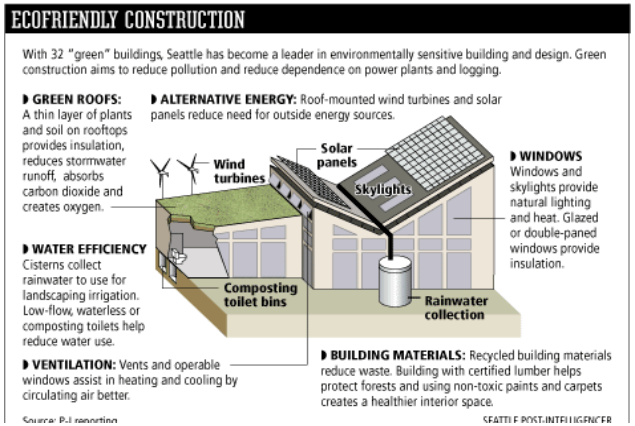
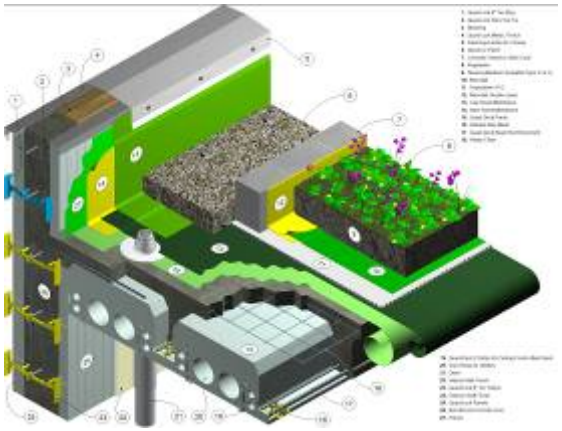


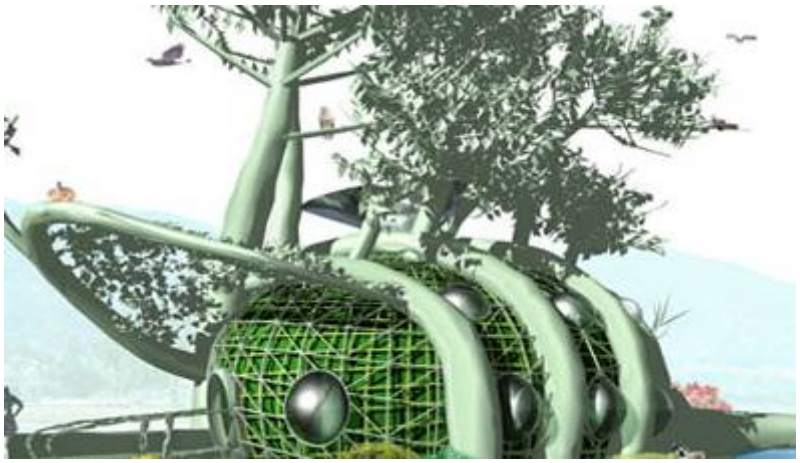
Establishing a framework for Sustainable Open Space Design

Understanding sustainable landscapes

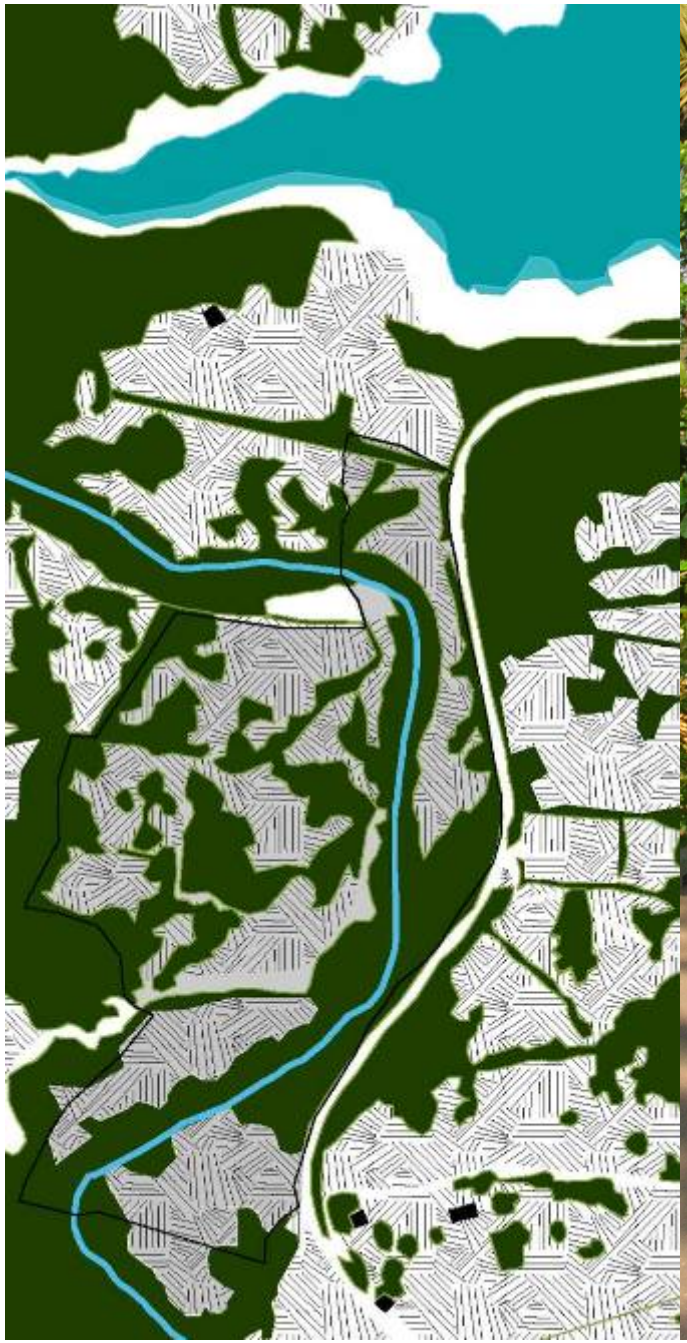


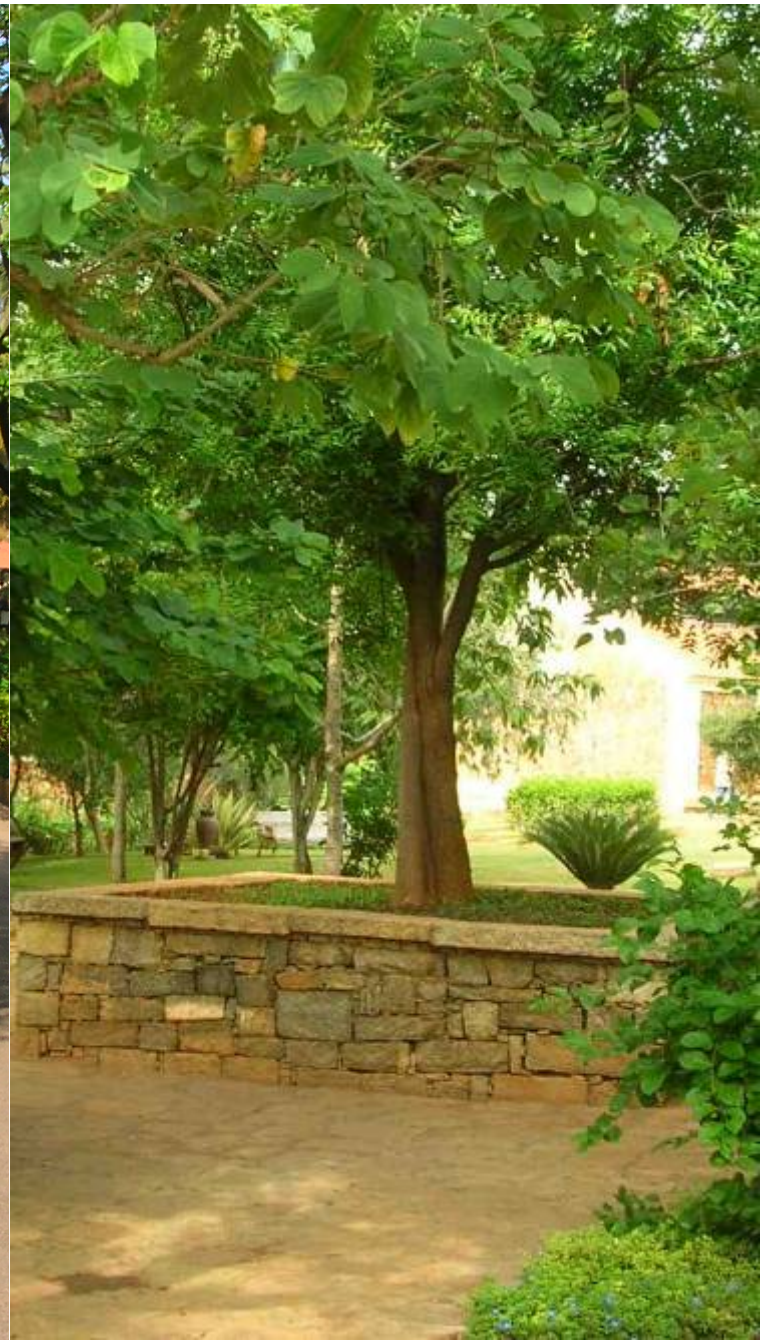






GREEN BUILDING AND ARCHITECTURE AS AN ESTABLISHED PROCESS





OPEN SPACES AND LANDSCAPES REMAIN UNDERVALUED

LAND

WATER

ECOLOGY

PRINCIPLES AND APPROACH TOWARDS SUSTAINABLE LANDSCAPE

LAND

To preserve and protect the existing natural geomorphologic features on site.

To design and work with existing land topography so as to avoid excessive cut and fill of soil/slopes.

To design and promote techniques to avoid erosion of top soil.

To design open space land-use based on hydro-geological conditions as well geomorphologic conditions of the existing site.

To develop specific and contextual site erosion control plan and suggests passive and natural methods for soil conservation and avoid adverse engineering techniques for the same.

To ensure that land not used for construction or as open spaces is utilized for productive purposes including growing food and managing waste.

5. Kitchen garden

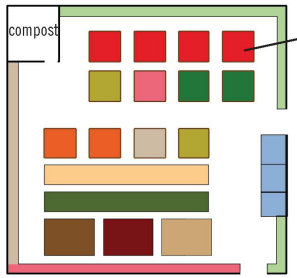
Water disponibility is limited. We can't cultivate vegetables which require too much water. Conversely, the sun gives much light and we don't have to fear frost. Most suitable species are:

	Harvesting date
Artichoke (common in sardinia)	July-September
Broad bean	June-July
Beatroot	July-November
Topinambour	October-April
Garlic	July
Onion	July
Carrot	October
Potatoes	July-September

Species require more water but appreciate full sun:

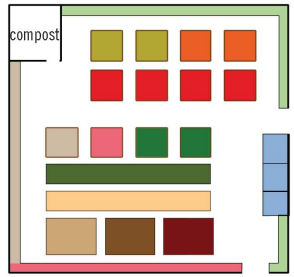
Tomatoes	July-August
Melon	July-October
Courge	July-September
Aromatic's herb (Thym, Estragon, Basil, Parsley, Verveine, Minth)	Summer

Organisation



This kind of edges can be made with young chestnut branches. We noticed before that the chestnut is a common specie in Sardinia. Moreover, this system protects vegetables from rabbits.

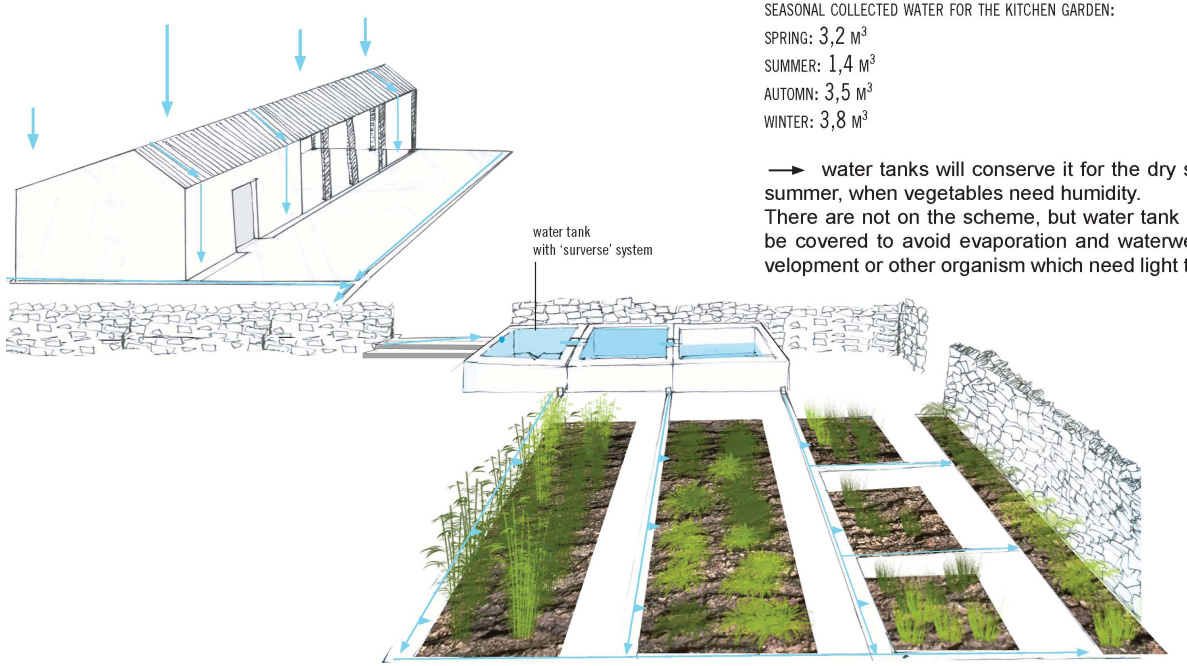
Rotation



Cultivated surface: 1290 m²

Rotation, each year, avoid disease development. Vegetables will supply the inn. For periods when any vegetables can be collected, its will be tinned and stocked.

Water management

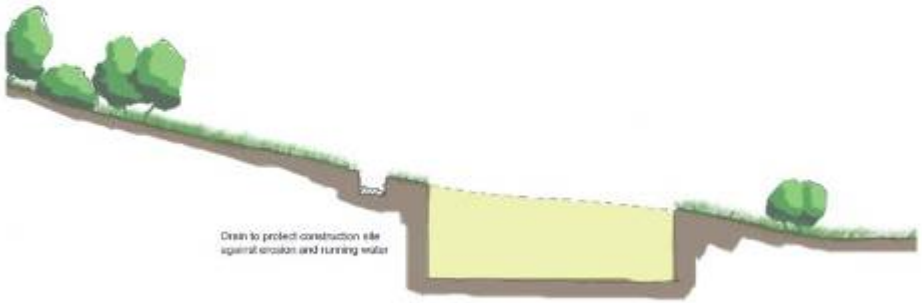


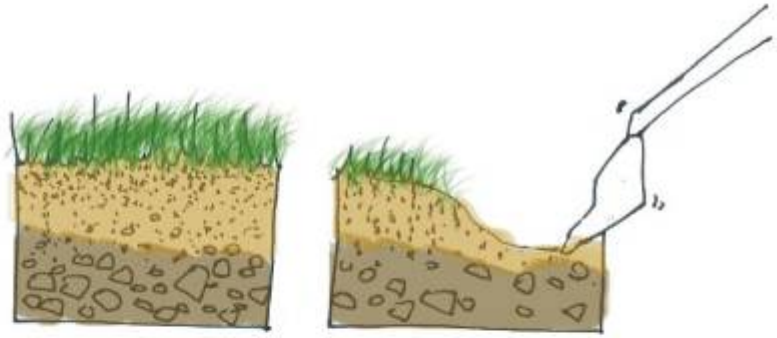
Seasonal collected water for the kitchen garden:

Spring: 3,2 m³
Summer: 1,4 m³
Autumn: 3,5 m³
Winter: 3,8 m³

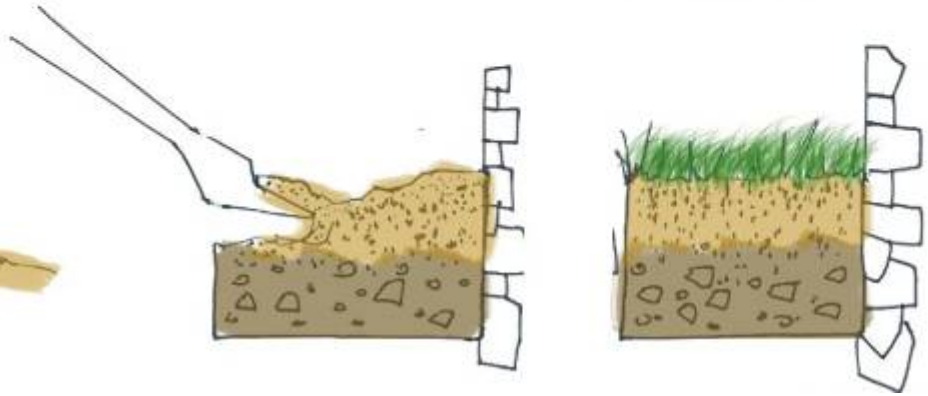
→ water tanks will conserve it for the dry season: summer, when vegetables need humidity.
There are not on the scheme, but water tank have to be covered to avoid evaporation and waterweed development or other organism which need light to grow.

However, we think that the water collected quantity is too tight. Water requirement have to be completed with another source.

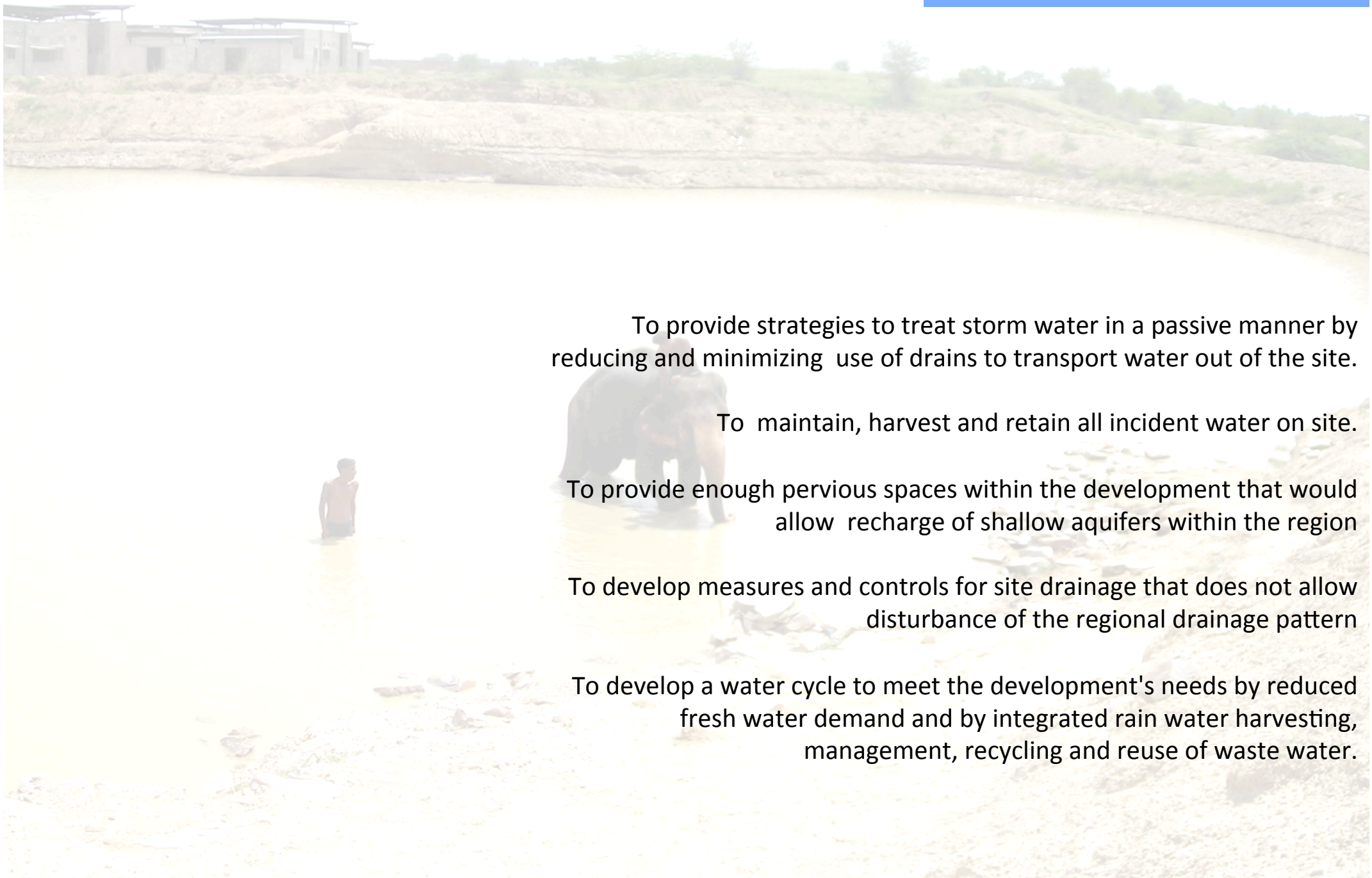




Construction period



WATER



To provide strategies to treat storm water in a passive manner by reducing and minimizing use of drains to transport water out of the site.

To maintain, harvest and retain all incident water on site.

To provide enough pervious spaces within the development that would allow recharge of shallow aquifers within the region

To develop measures and controls for site drainage that does not allow disturbance of the regional drainage pattern

To develop a water cycle to meet the development's needs by reduced fresh water demand and by integrated rain water harvesting, management, recycling and reuse of waste water.

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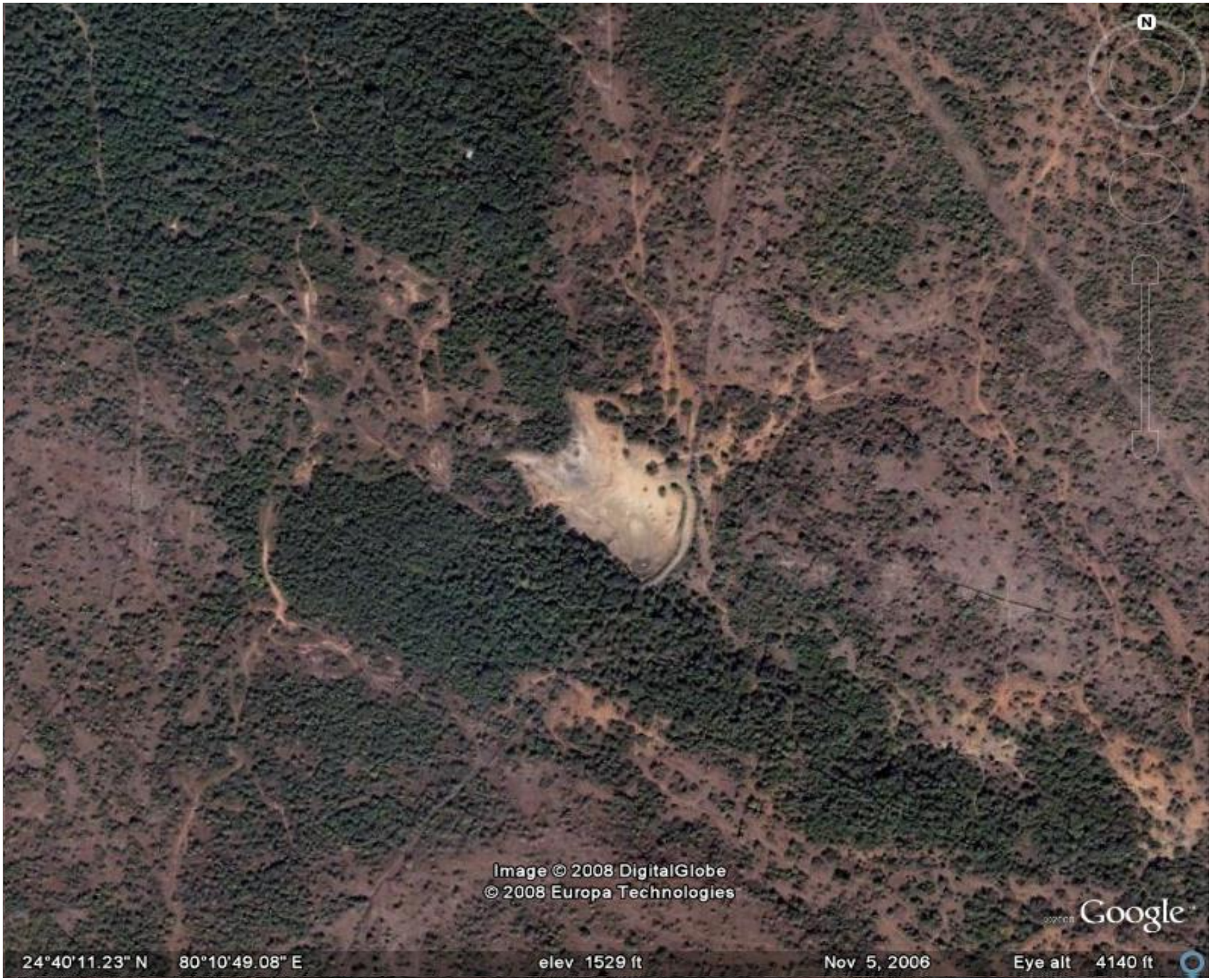
Image Courtest: RMA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Google
24°40'11.23" N 80°10'49.08" E elev 1529 ft Nov 5, 2006 Eye alt 4140 ft

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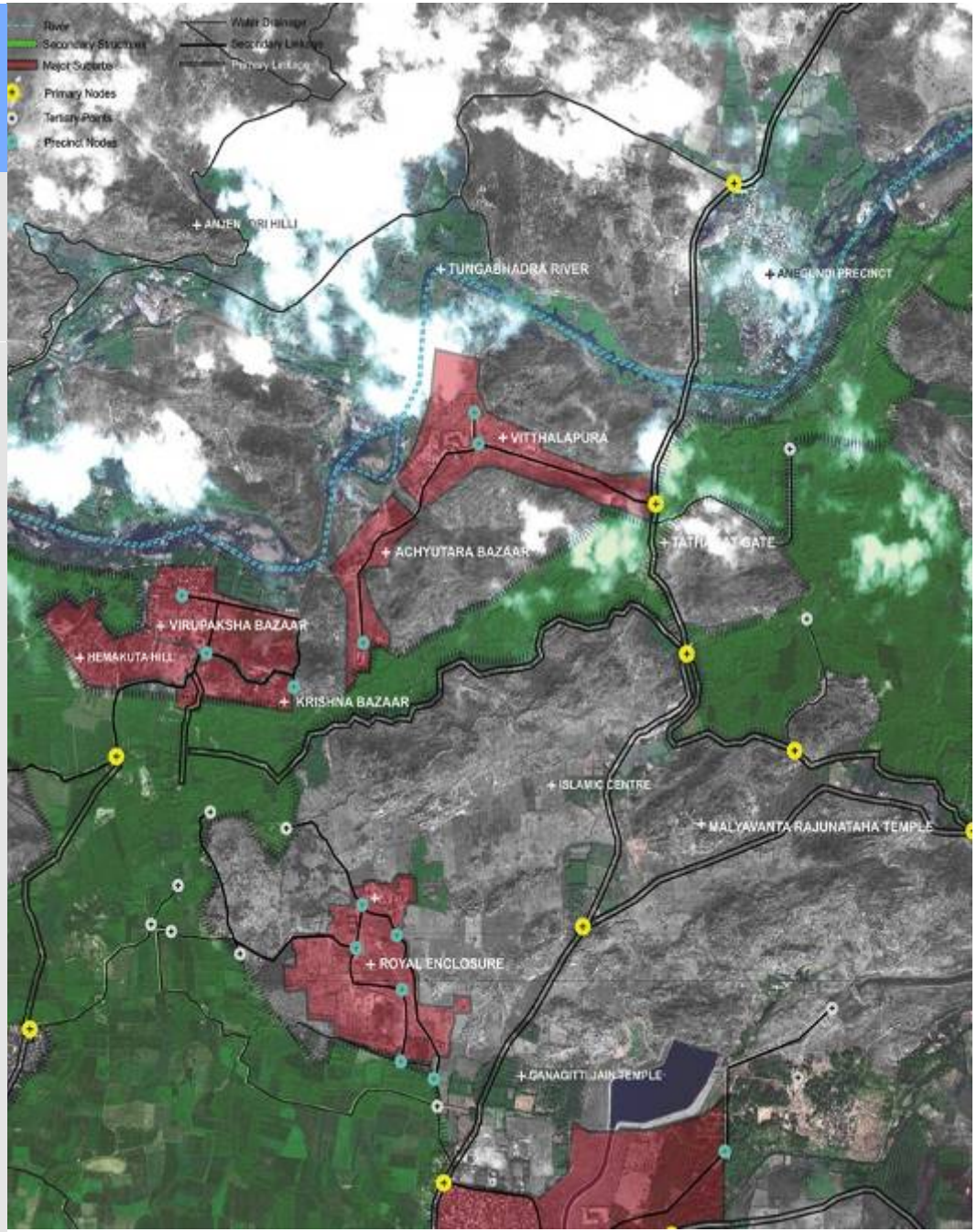
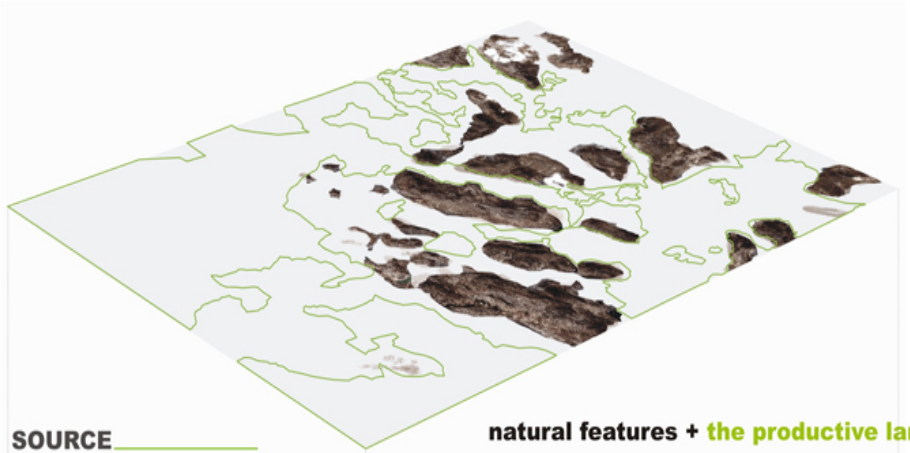
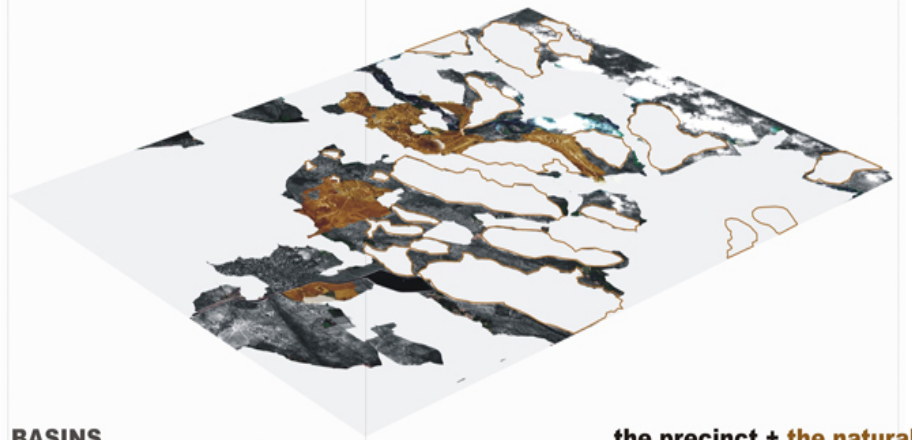
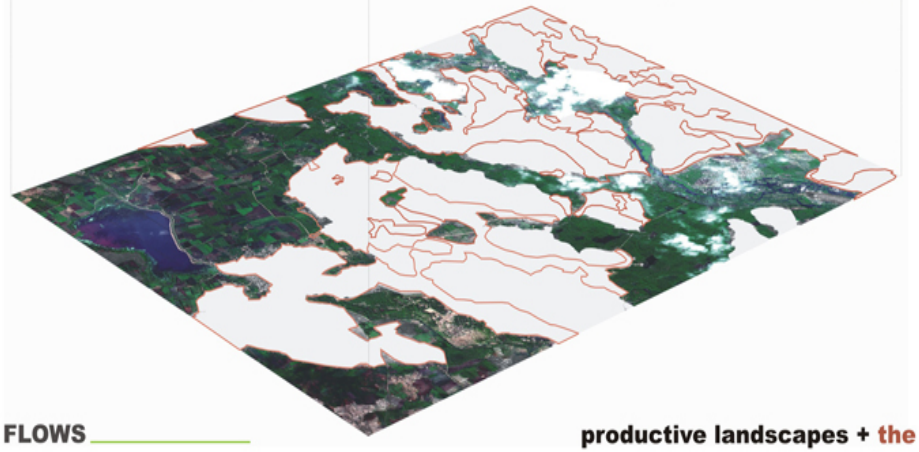




SOURCE natural features + the productive landscapes



BASINS the precinct + the natural features



FLOWS productive landscapes + the precinct

Traditional settlements and their interdependency on Landscape systems - an integrated morphology derived through local contextual associations with livelihood patterns, natural systems, urban orders, and agricultural techniques

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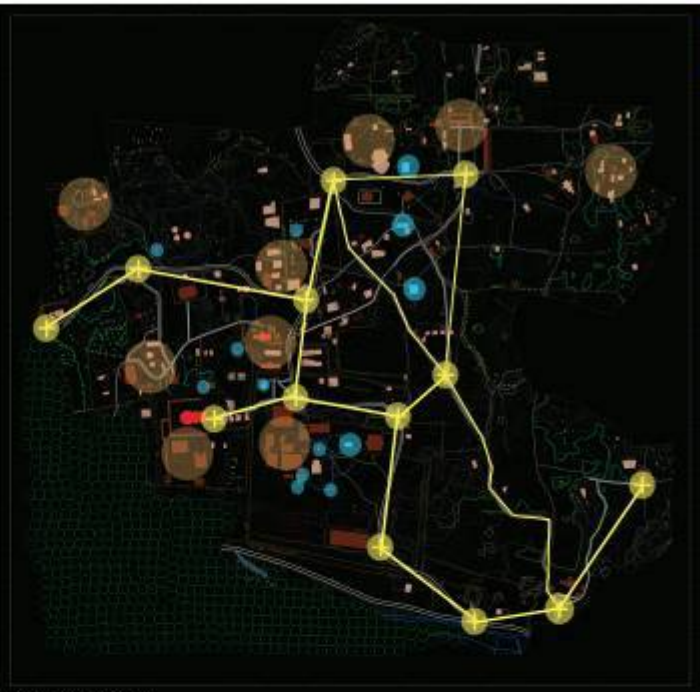
COURTYARD

This fortified area had been the seat of power of the fallen empire. Sprawling over many hundreds square meters, this fortified area is scattered with a number of interesting relics. The Royal Centre occupies the western end of the Urban Core. The roughly ovoid zone, narrower to the southwest and opening to northeast is contained within its own arc of fort walls, though these are no longer complete. Large gateways leading into the Royal Centre stand to the east, now forlorn in the middle of fields. The Royal Centre is where the Vijayanagara kings and their private households lived and conducted the daily business of ceremony and government. A good deal of the zone is subdivided into irregular interlocking compounds by high slender walls built of tightly fitted granite blocks that face a rubble core.

The Hazara Rama temple, which served as a royal chapel, is the hub of the enclosures of the Royal Centre. One of the principal roads of the city that runs to the northeast from the temple, through a gateway in the enclosure wall, is lined with lesser shrines.

The compound southeast of the Hazara Rama temple is linked with the public and ceremonial life of the Vijayanagara kings. Here can be seen the basement of an extensive audience hall. There are 100 stone footings for columns, presumably made of timber, that have long ago disappeared. The nearby multi-storeyed Great Platform, popularly associated with the Mahanavami festival, stands nearby. Its lowest granite stages are covered with animated reliefs portraying the life of the Vijayanagara kings. A stepped tank immediately to the south, and other nearby bathing places, were probably used on particular festival occasions.



ROYAL ENCLOSURE

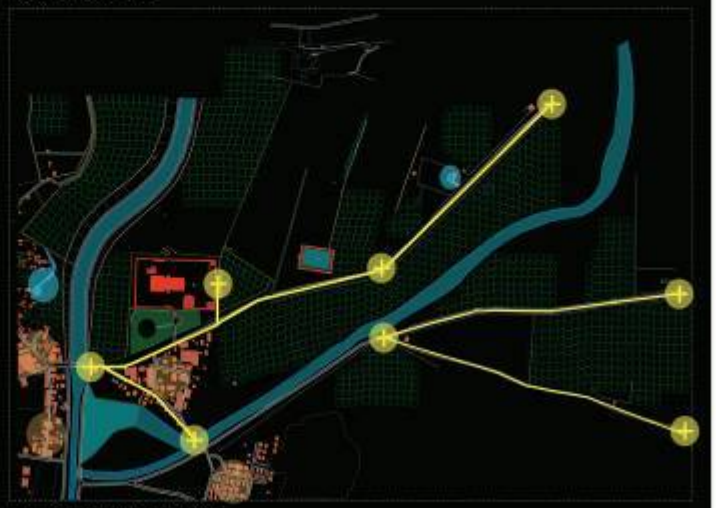
This fortified area had been the seat of power of the fallen empire. Sprawling over many hundreds square meters, this fortified area is scattered with a number of interesting relics.

A short distance to the east of Kamalapura is the Pattabhirama temple, a religious complex that served as the nucleus of a sixteenth century suburban quarter. An elevated platform to the southeast of the town may have been used to view state ceremonies.

The Pattabhirama Temple is a major pilgrimage center in the ruined city of Hampi. Along with the Virupaksha and Vitthala temples, the Pattabhirama temple embodies the prolific temple-building ventures of the Vijayanagara rulers.

This presiding deity of the Pattabhi Rama temple is Lord Rama. Known for its splendid architecture, the temple complex is confined within a large rectangular enclosure. The sanctum sanctorum with its axial mantapas is situated in the centre of the courtyard. A pillared colonnade runs along the inside of the wall round the courtyard.

The large and square maha-mantapa is a finely proportioned seven aisled structure with tall and slender composite pillars of various types. To the east of the ardha-mantapa is the usual covered pradakshina-prakara enclosing the garbha-griha and the antarala.



PATTABHIRAMA PRECINCT

HAMPI - PRECINCT ORGANIZATION

This complex is located about two kilometers down-stream from Hampi near the bank of the Tungabhadra River, towards the north east of the Sacred Centre. The south of this river is lined with structures. It formed the nucleus of an urban quarter. The temple dedicated to Lord Vishnu also known as Vitthala or Vithoba or Pandurunga - the Ishta Devata of Shri Purandara Dasaru. The temple was started in the year 1513AD during the reign of King Krishna Deva Raya probably after his victory over Prataparudra Gajapati, the ruler of Orissa. Hence the prefix "Vijaya" which means victory is attached to the temple name. However, the project being so large and change in guard at Vijayanagara, the temple was not complete until 1565 when the empire fell.

In Vijayanagara times the districts surrounding the temples were refered to as pura. While there was clearly a concept of a district or town surrounding the temple, the exact boundaries of that area are unknown today. The Vitthalapura can be well defined although, geographically, and the physical constraints of the site are part of the reason why it was selected for this part of the study. The Tungabhadra river flows in a north easterly direction approximately 100meters west of the Vitthala temple. Boulder covered granite ridges to the north and south constrain the district in these directions. Whereas the Gejala Mantapa, that marks the end of the chariot street is the boundary on the other end of the Bazaar Street.

VITTHALA PRECINCT

It believed that this temple has been functioning uninterruptedly ever since its inception in the 7th century AD.The orginal worship place was only a few separate humble shrines (believed to be as old as 7th century) housing the image of the god and the goddesses. Over the centuries the temple gradually expanded into a sprawling complex with many sub shrines, pillared halls, flag posts, lamp posts, towered gateways and even a large temple kitchen. This temple is located on the south bank of the river Tungabadra. This area in general has been an important pilgrimage centre for the worshipers of lord Shiva. It is indeed the most ancient, most sacred and most lavishly planned spot at Hampi, and indeed,the best preserved of the Vijayanagara period. Its earliest name was Pampatirtha (689 A.D.) and by 1018 A.D. it had grown into Pampapura. Between 7th and 13th century, its fame spread under various names. By archival records, in the year 1200 A.D.,there was a brimming settlement of Sivasannas called 'Sivapura' attached to the Virupaksha temple complex.It is obvious that what was called as Pampa during the 7th century developed itself into Pampatirtha and Virupakshatirtha subsequently and further expanded into a town named as Pampapura by about 11-12th century and came to be popularly known as Hampi by the beginning of the 13th century. During the late 13th & 14th century, the place begun to be known by different names like Hosapattana and Virupakshapattana, which indicate either the rise of a new township or extension of an existing settlement under new names.

VIRUPAKSHA + ACHYUTRAYA + KRISHNAPURA

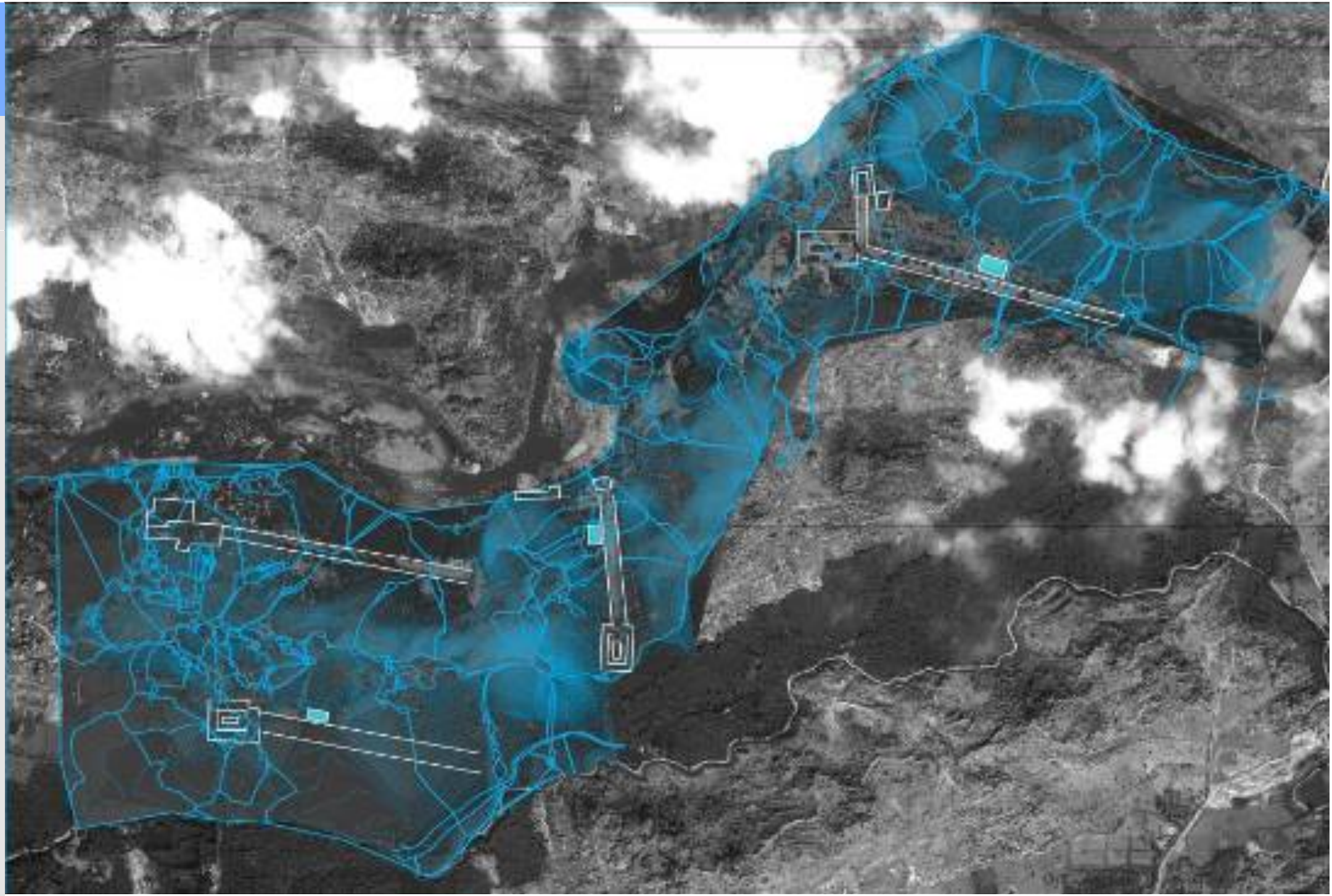
HAMPI - PRECINCT ORGANIZATION

CANAL PERFORMANCES THROUGH THE TERRITORY

While the Tungabhadra is a perennial river system, the fact that it is situated in peninsular India renders it completely dependent on the vagaries of the monsoon in distant catchments, unlike the northern part of the country's rivers that receive snow melt. As highlighted earlier, the canal network that permeates the territory is almost exclusively designed for agricultural use and the urban cores were made isolated from of this water supply system. With the exception of one urban core, Krishnapura, all other settlements are completely independent of the river's waters and designed and managed to sustain exclusively on rain water. Thus, the canals are designed and constructed to feed the rich agricultural valleys thereby ensuring adequate food security for the city and at the same time protecting the fertile lands from urbanization. The canals structure the natural landscape in a manner that ties it in a manner that is homogenous and symbiotic with the built landscape.

PRODUCTIVE LANDSCAPES AND TERRITORIAL ASSOCIATION

A striking visual aspect of the urban structure of Vijayanagara is the nearly unobtrusive nature of the built component within the landscape. A key driver of such a development is the integration of productive landscape within the network of urban systems. In fact, it would be more correct to say the opposite – that the urban systems are integrated with the productive landscape – since it is these landscapes that are accorded primacy within the larger development. Careful analysis of the layers reveals a process through which key components of the natural landscape such as the hills, boulder formations, river fronts, etc are left almost undisturbed. The fertile valleys with the best soil cover are defined as productive landscapes given over to agriculture, sustained by a network of irrigation canals fed from the river Tungabhadra. It is only in the next level of prioritization that the urban systems including bazaars, housing and other civic structures are embedded within the 'remaining' lands, deemed as less productive spaces.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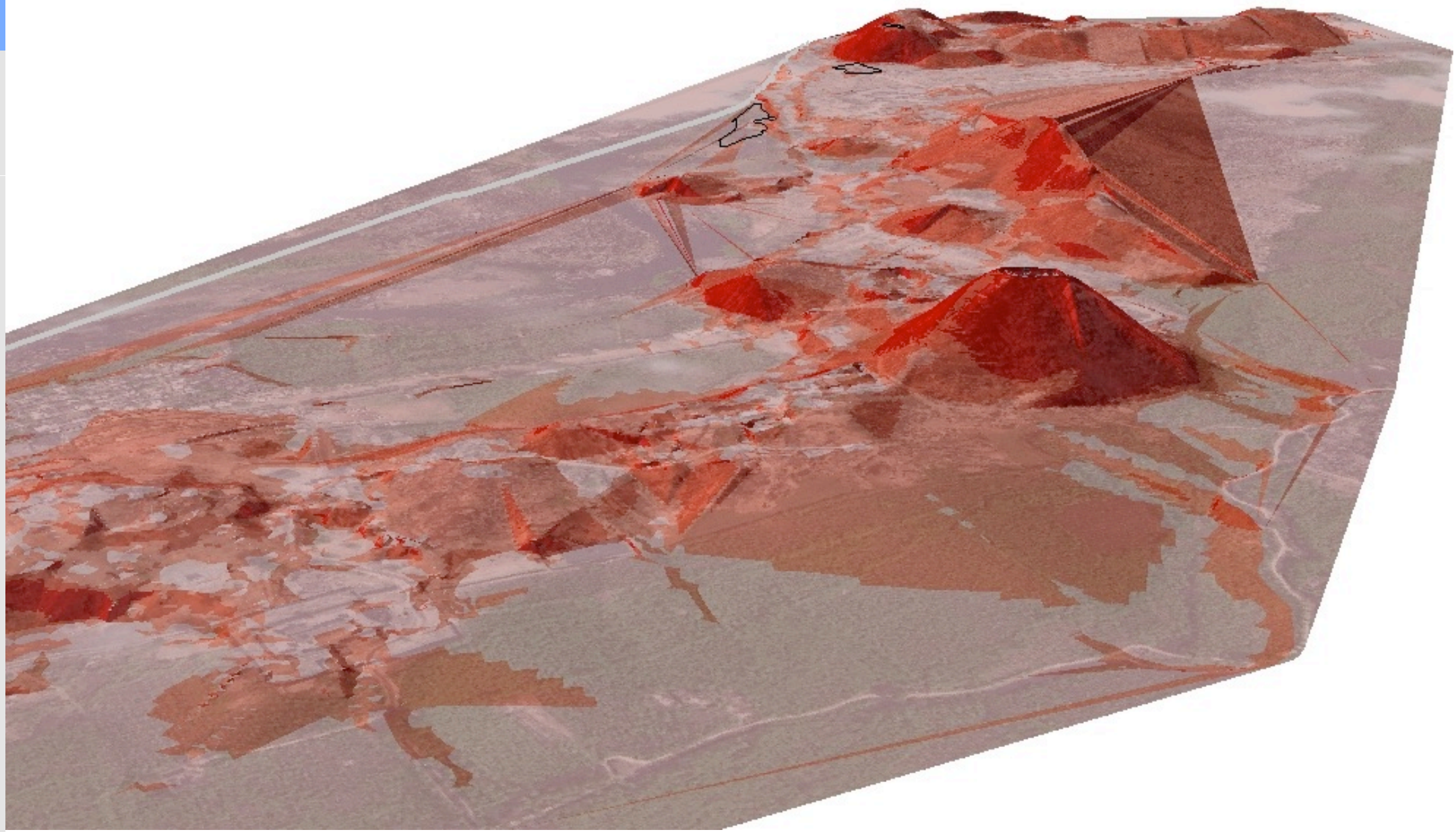
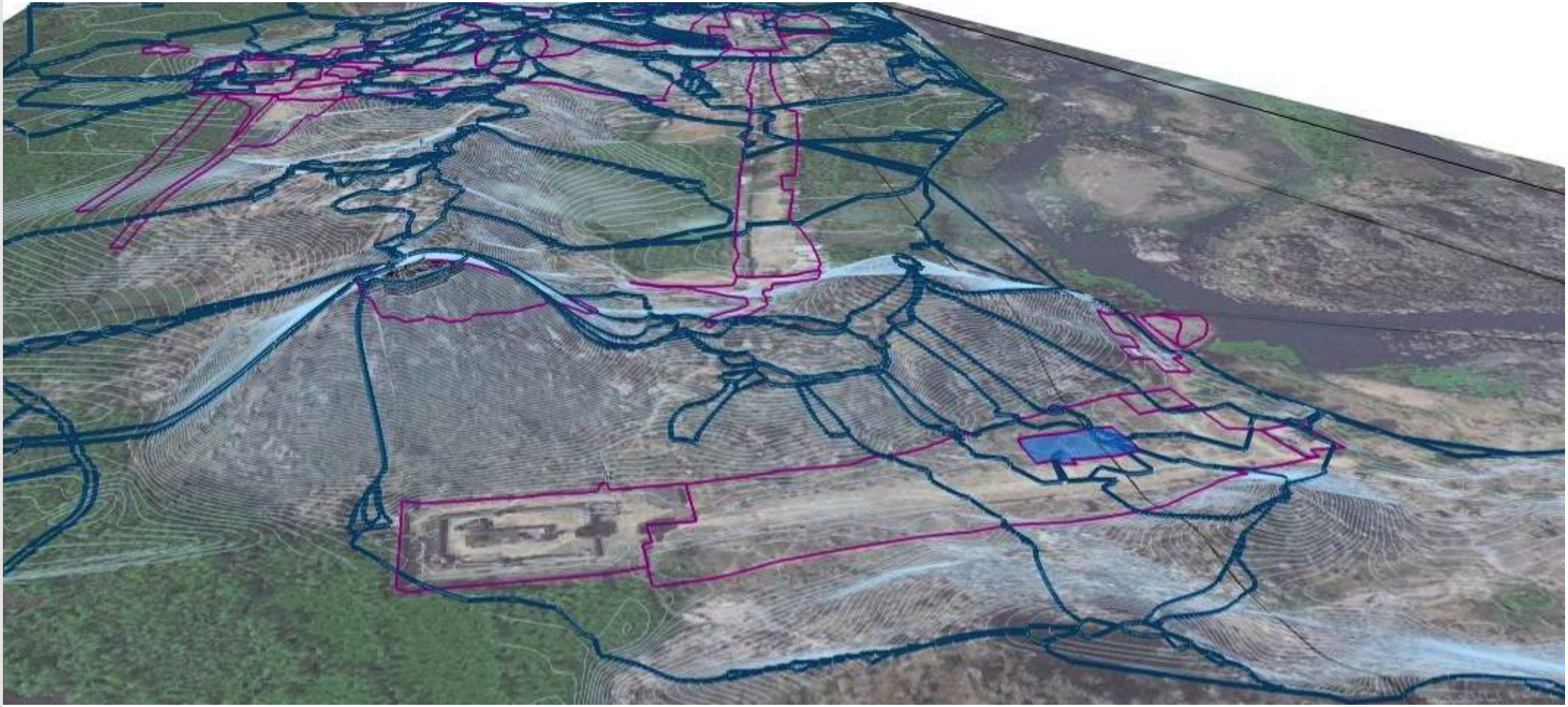
Digital Terrain Model of Topographic character



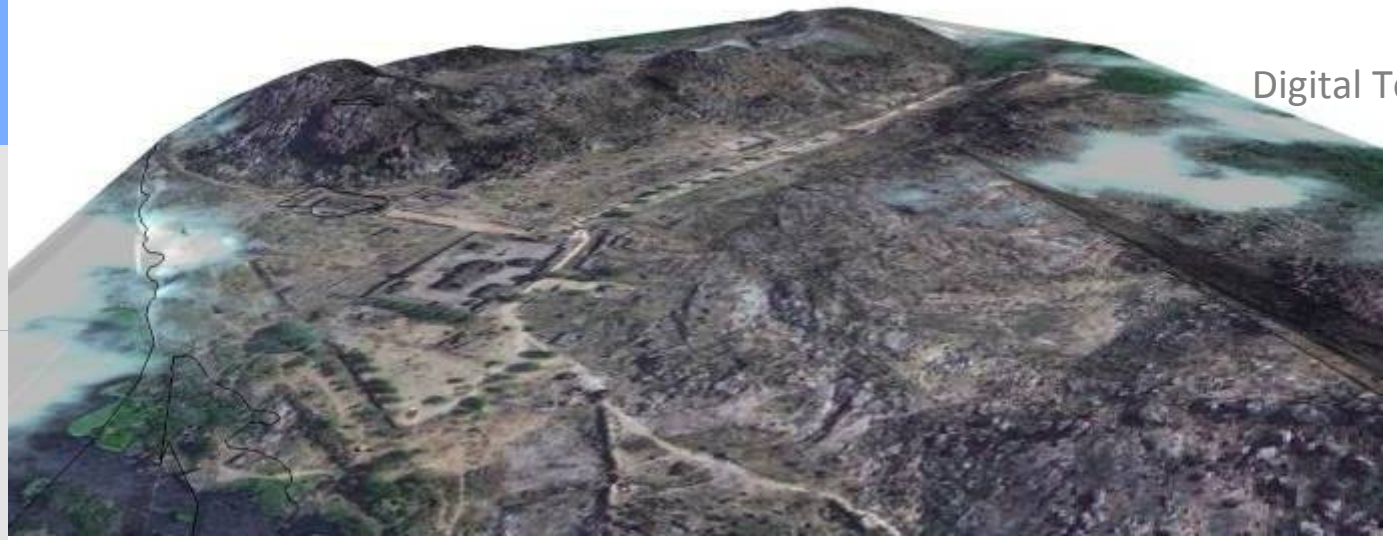
Achuyatupura Precinct

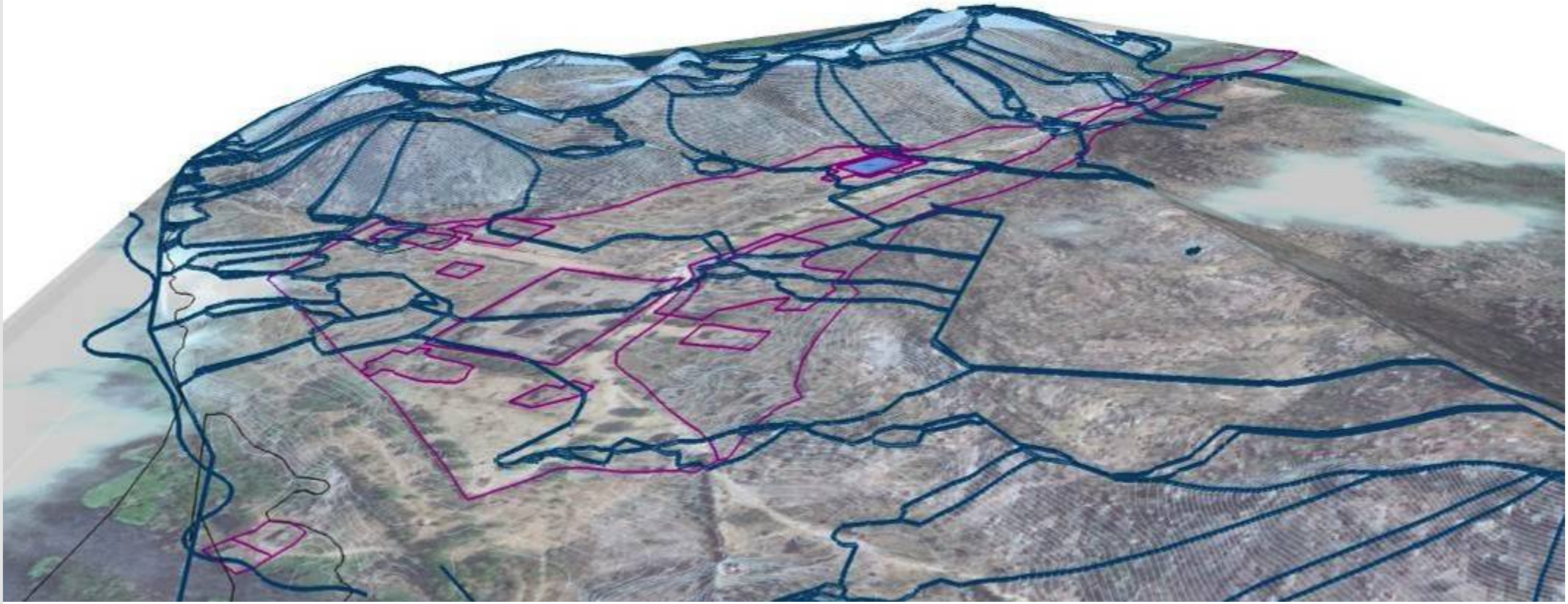
Digital Terrain Model of the site, its watershed and drainage lines



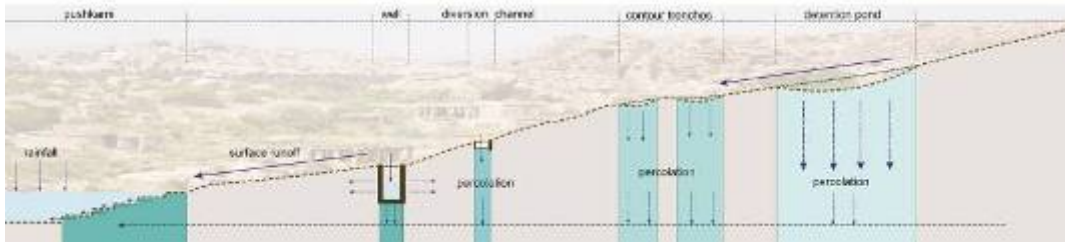
Vitthala Precinct

Digital Terrain Model of the site, its watershed and drainage lines





Drainage Pattern – Vitthala precinct



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Detention pond behind the Western Bazaar Street at the foothills

Pushkarni as seen from the Mantapa

Small depressions

Vitthala precinct

Identification of detention ponds to be upgraded and cleared off vegetation to increase percolation rate to improve water performance

Small depressions are identified as detention ponds to feed the water bodies and reactivate the ancient water network

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ECOLOGY

To preserve existing vegetation on site after careful analysis of ecological values and condition of existing trees.

To preserve all endangered vegetation, if existing on site

To propose and encourage the growth of indigenous species on site that contributes towards development of a sustainable site ecology.

To avoid use of purely decorative plants or shrubs, but encourage planting of dense ground covers to protect the top soil of the land.

To propose a vegetation palette with a significantly reduced water demand.

To encourage maintenance of variety of local habitats and introduce them wherever appropriate and possible.

To develop a strategy aimed at mitigating urban heat island effect and to recreate a benign micro climate through reduced radiation and airborne dust and increased evapo-transpiration.

Aim for progressive improvement of land health and increased resilience of the site ecosystem over time.

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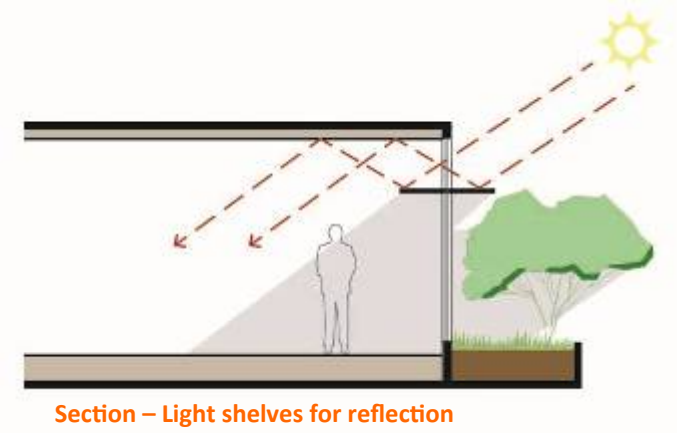
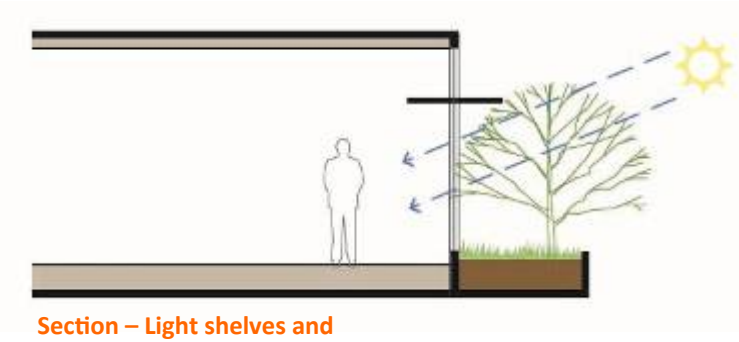
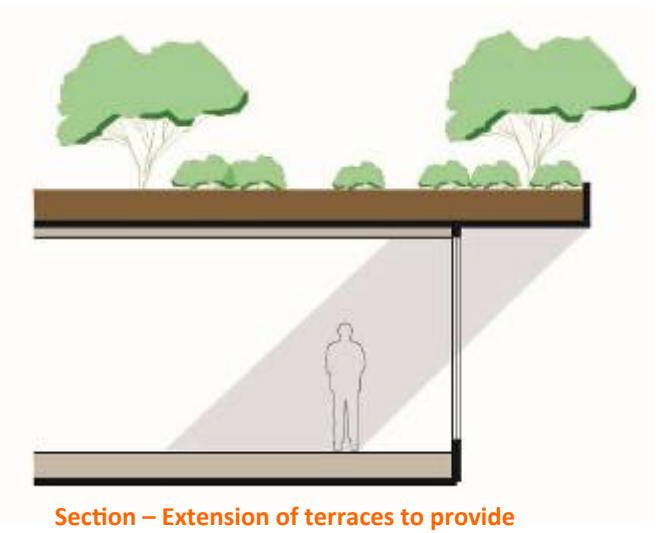


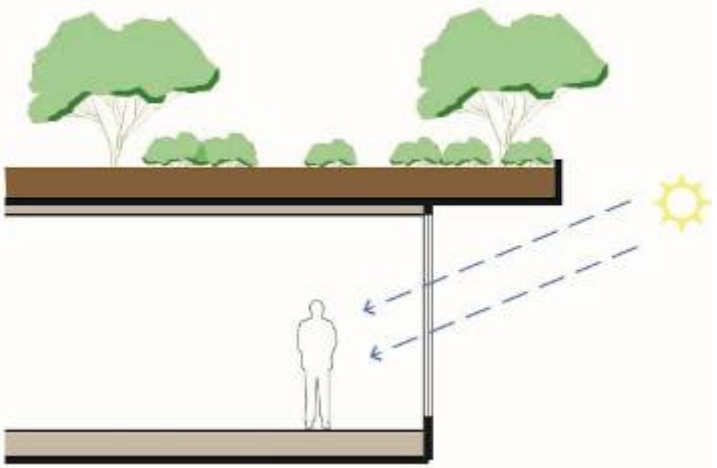
Section – Light shelves for reflection and dispersion of summer sun.



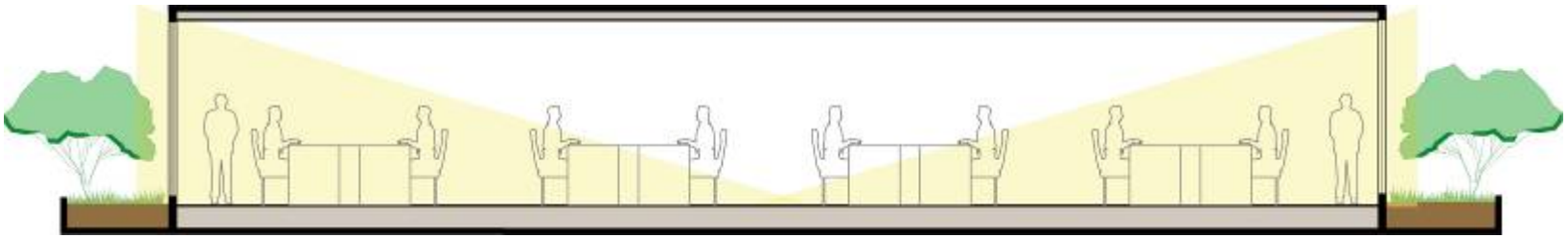
Section – Light shelves and penetration of winter sunlight.



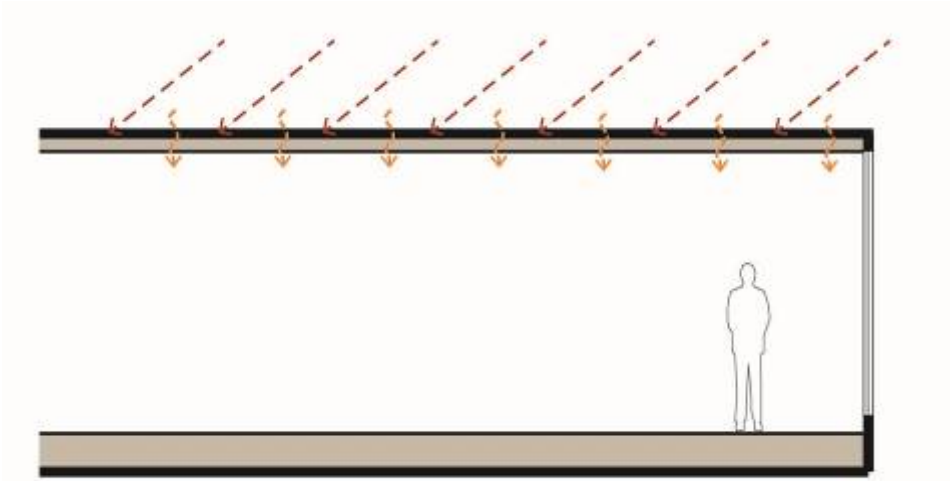
Section – Extension of terraces to provide protection from summer sun.



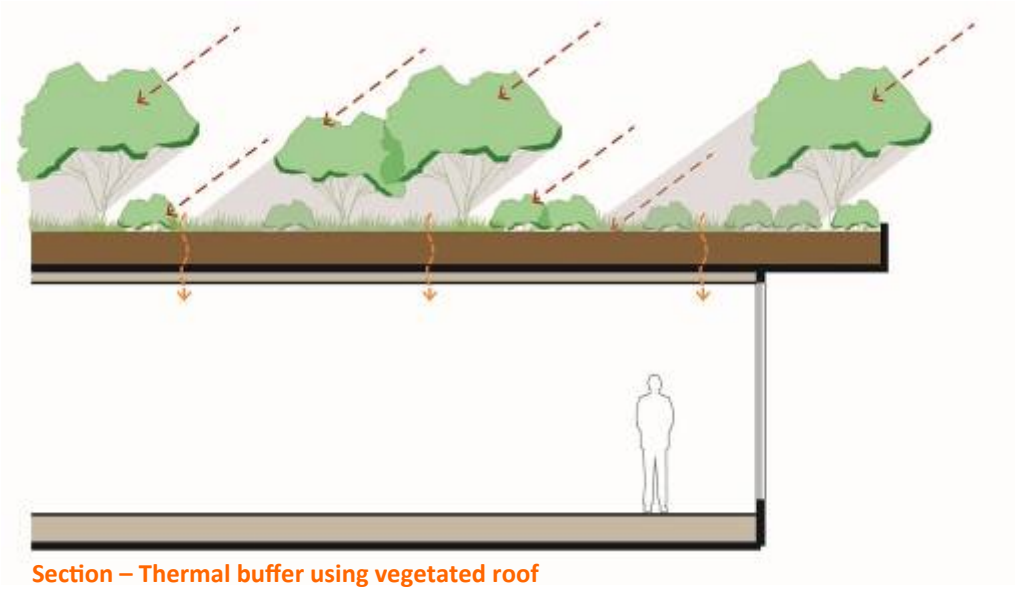
Section – Extension of terraces to allow penetration of winter sun.



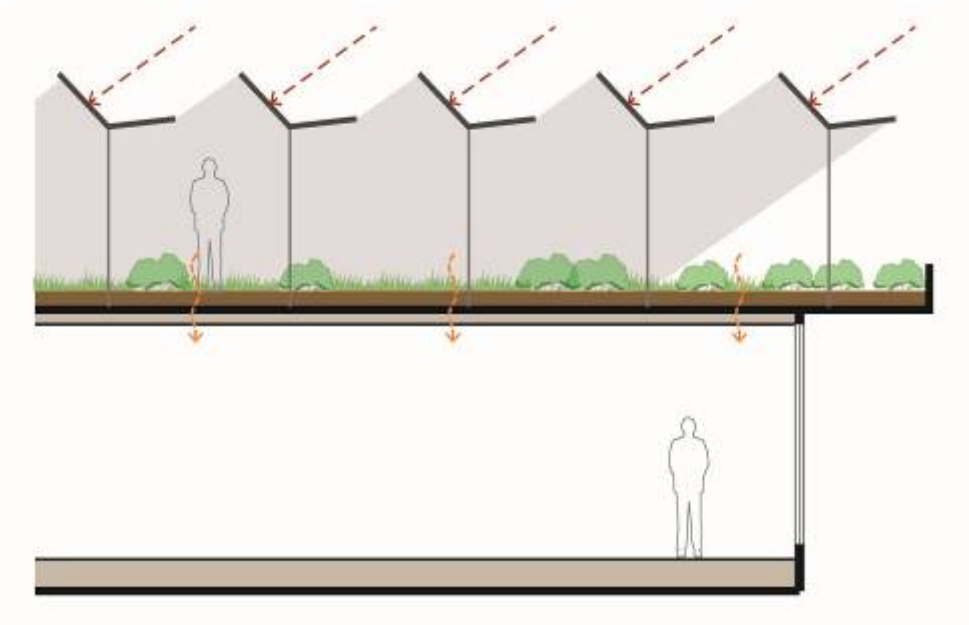
Section – Maximum width of building maintained at 23 m to ensure penetration of daylight into the interiors.



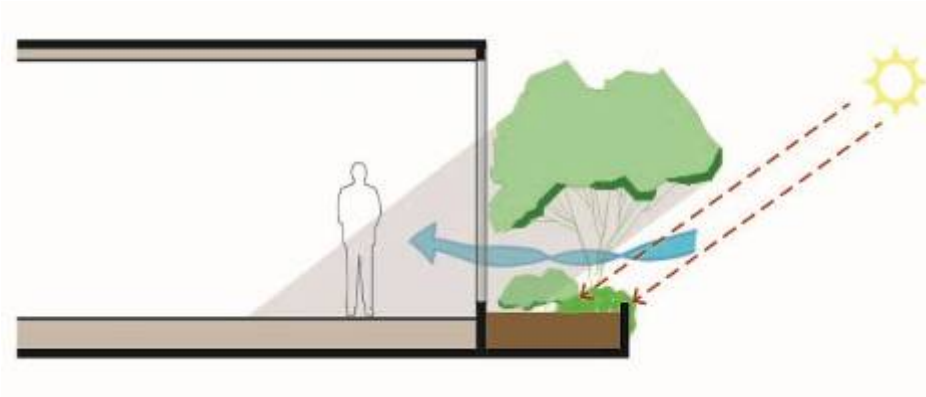
Section – Direct heat gain from exposed roof slab



Section – Thermal buffer using vegetated roof slab



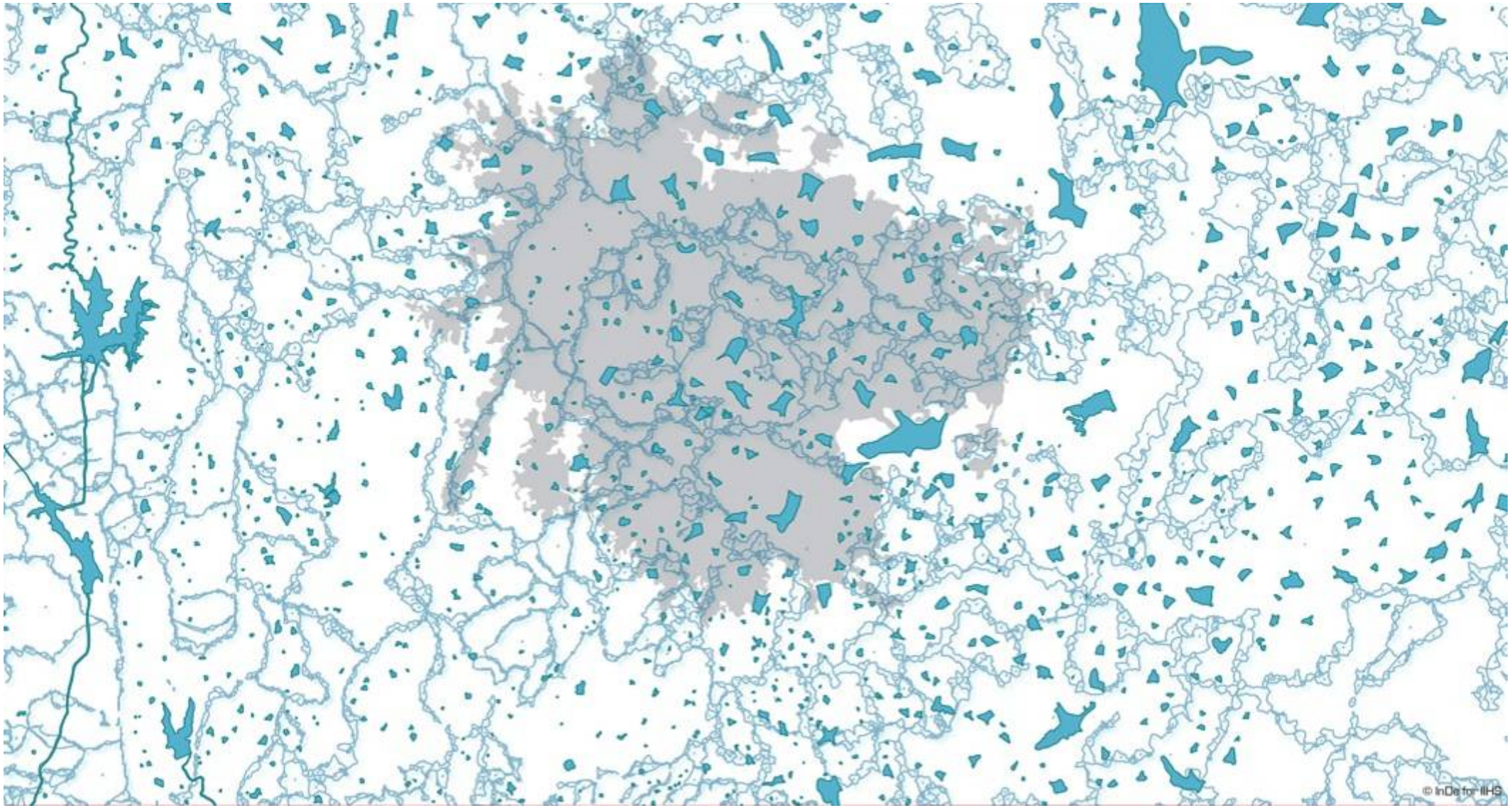
Section – SPV array over vegetated roof for increased efficiency



Section – Deep planters as radiation blankets and positive aesthetics


SpiderLogic


भारत

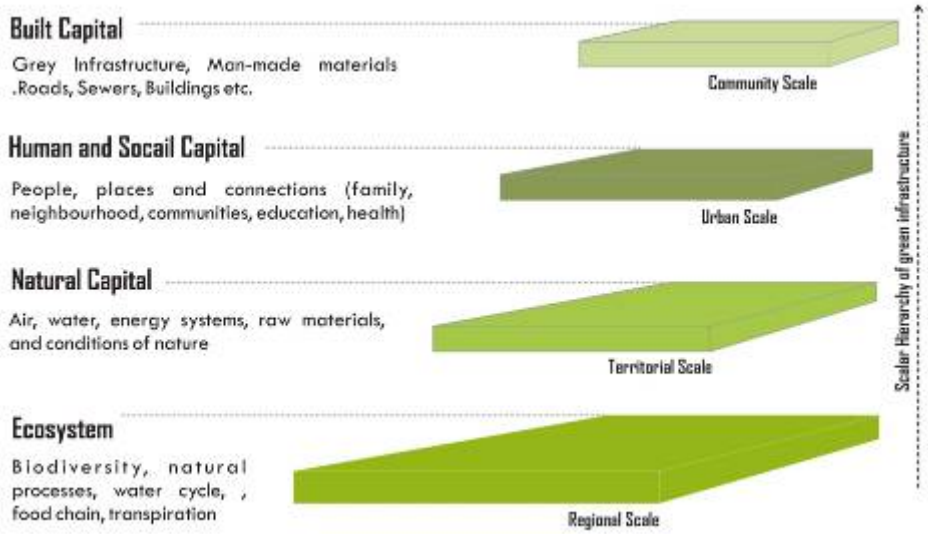


EXTENDING LANDSCAPE AS A PLANNING AND DESIGN TOOL

Regional level

City level

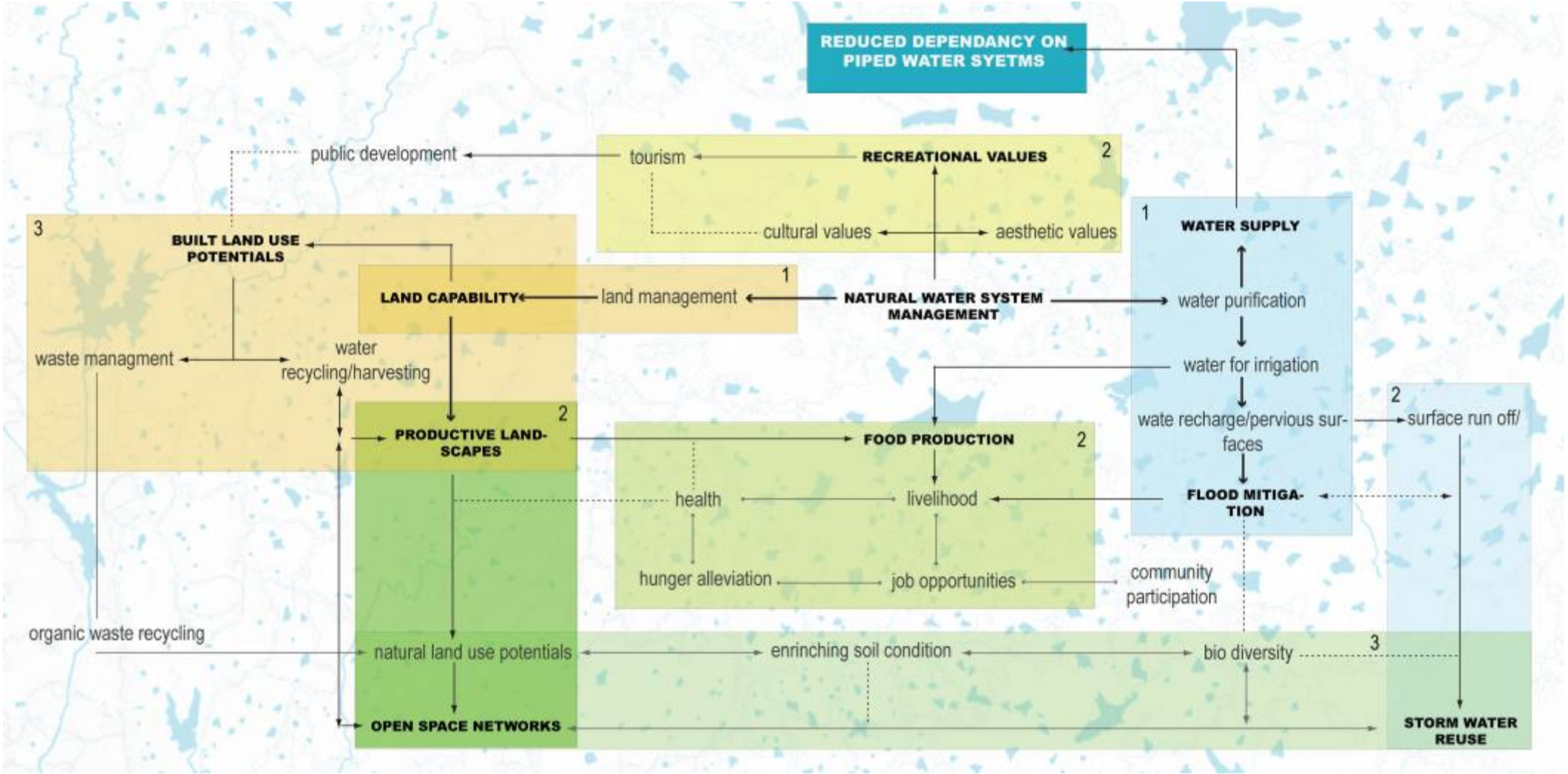
Scales of Sustainabiltiy

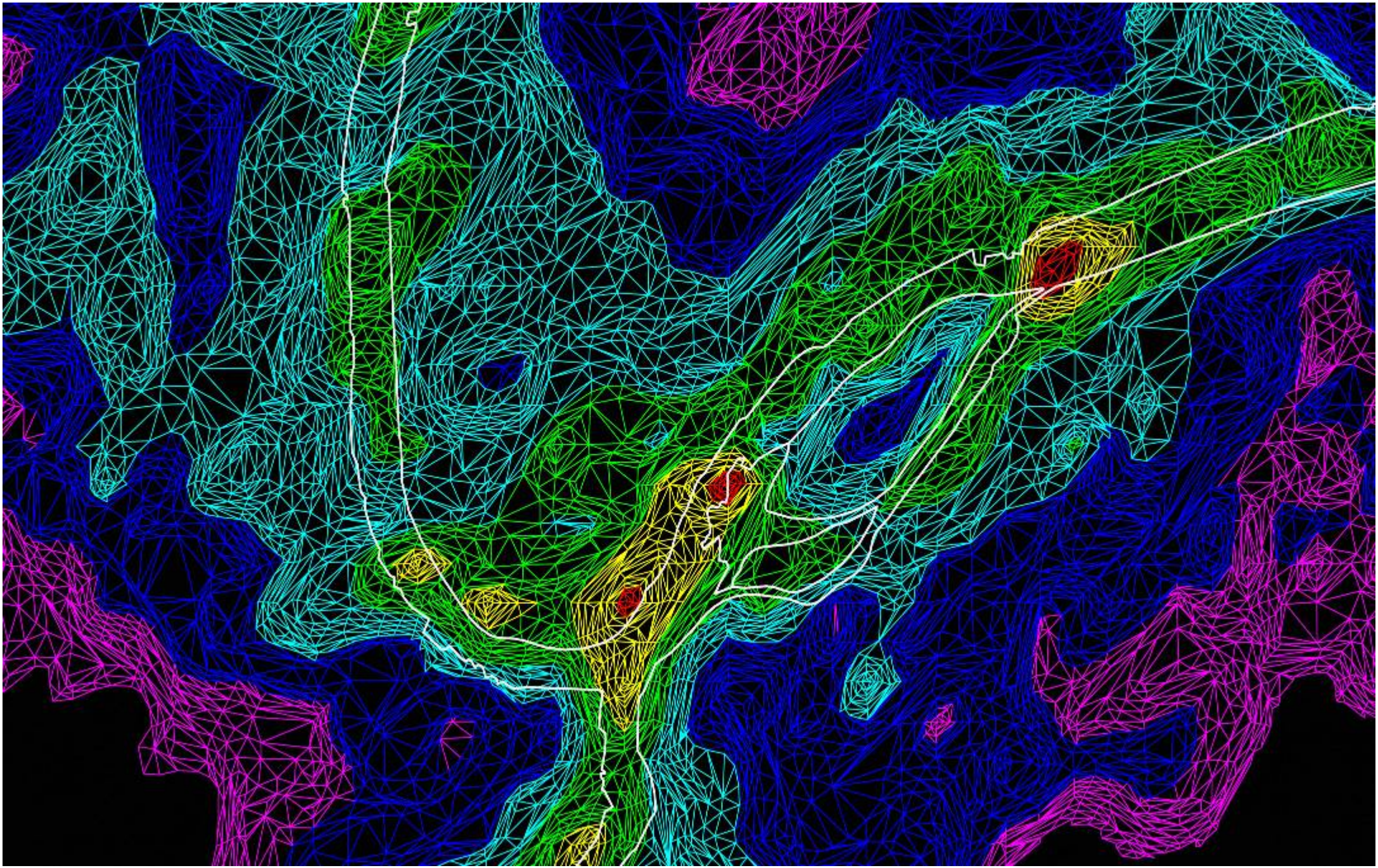


Urban level

Building level

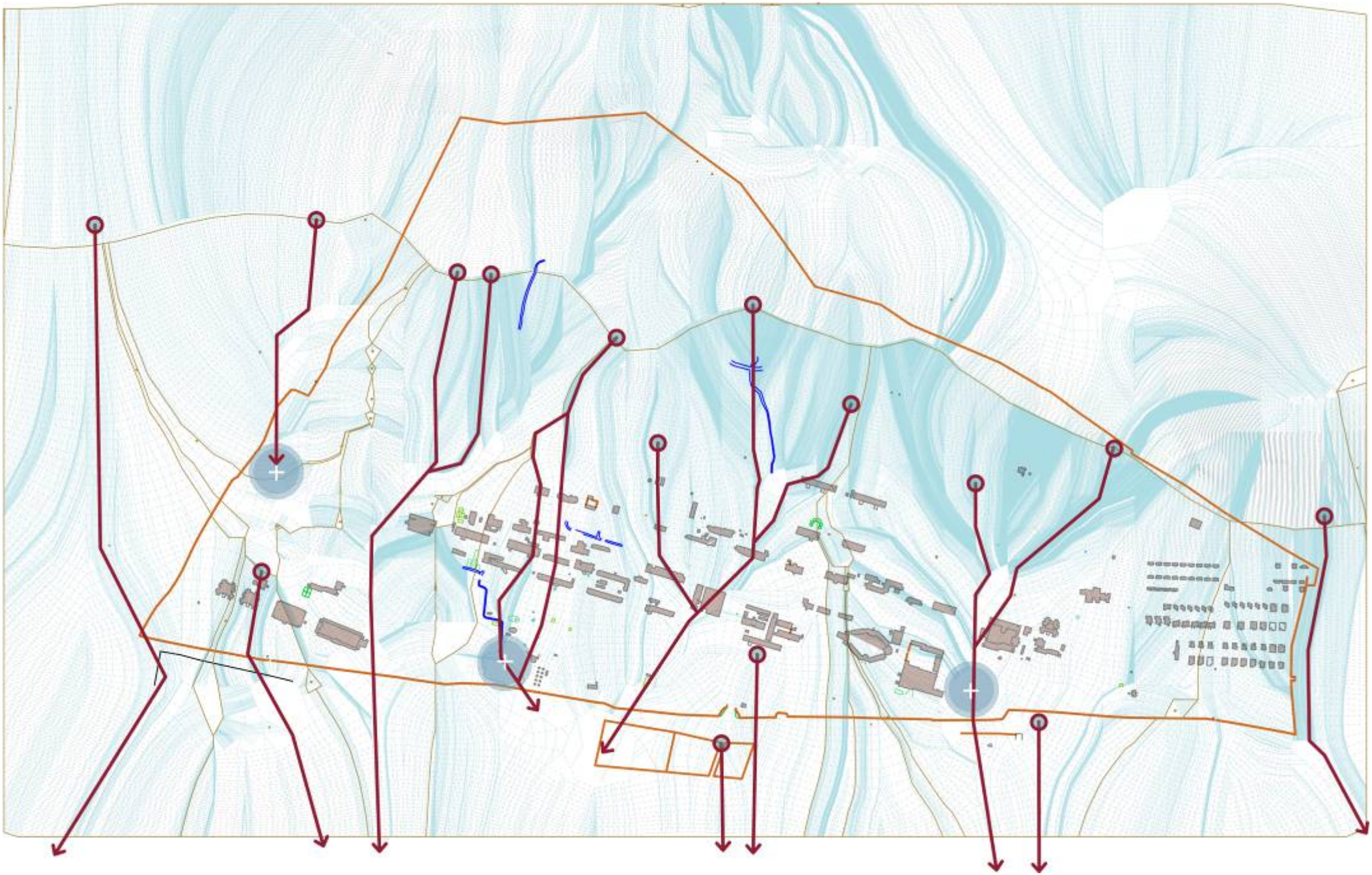
Understanding Sustainability as an ECOLOGICAL matrix



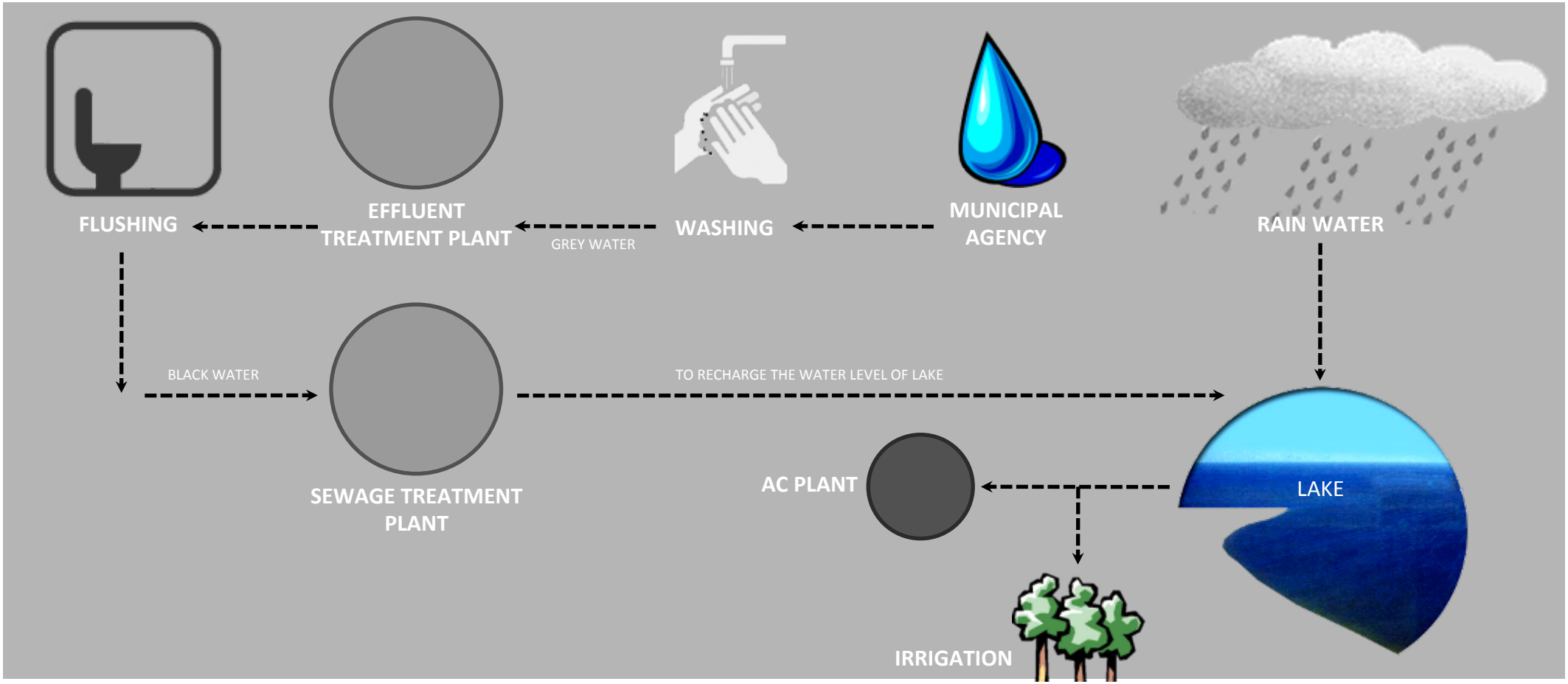


UNDERSTANDING CITY AS A LANDSCAPE MEDIUM

POSITIONING NATURE AS THE PRIMARY ORDER

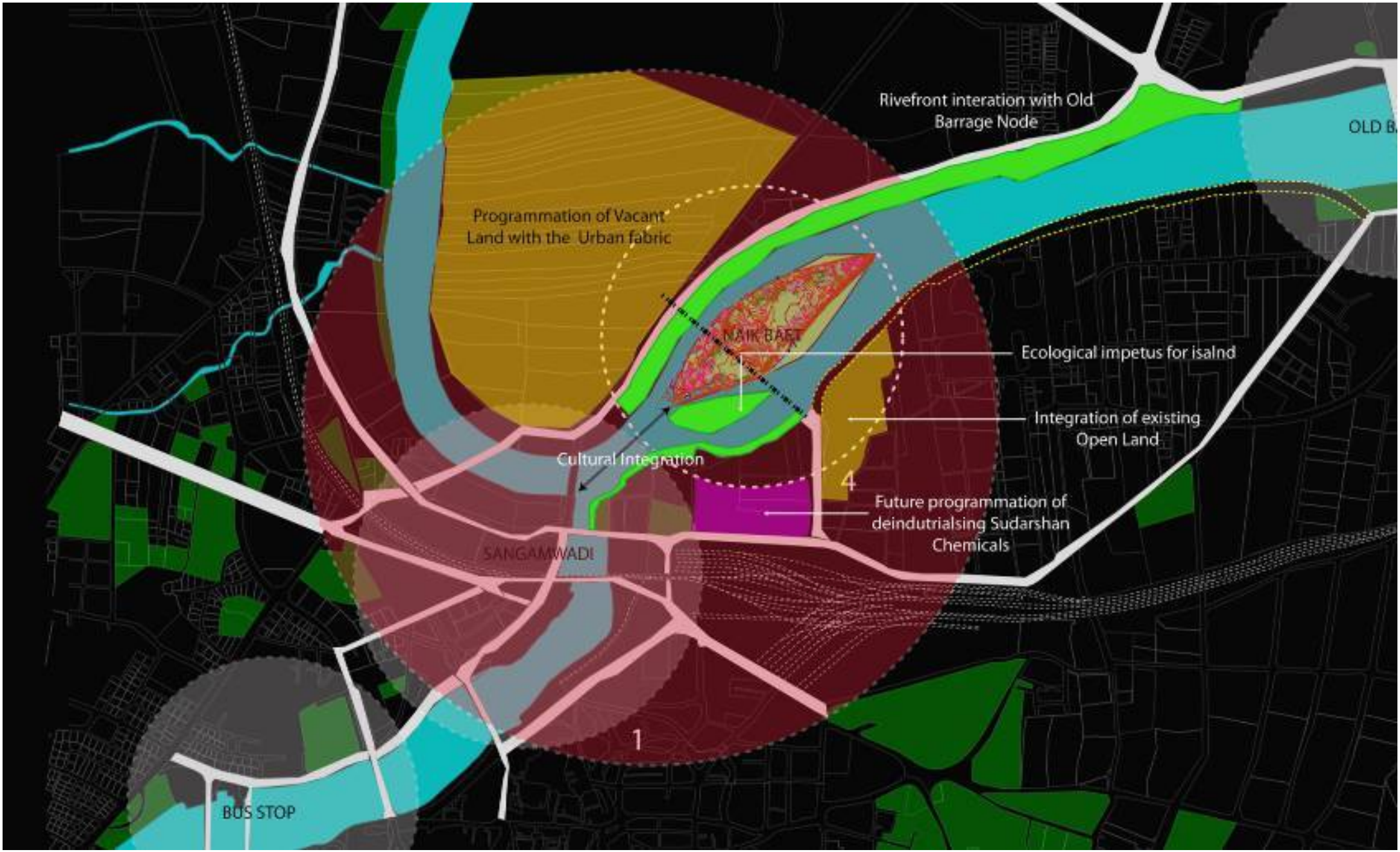


CAPTURING INTANGIBLE NOTIONS OF WATER



ESTABLIHING AN ECOLOGICAL MATRIX

GEOCLIMATIC CONSIDERATIONS

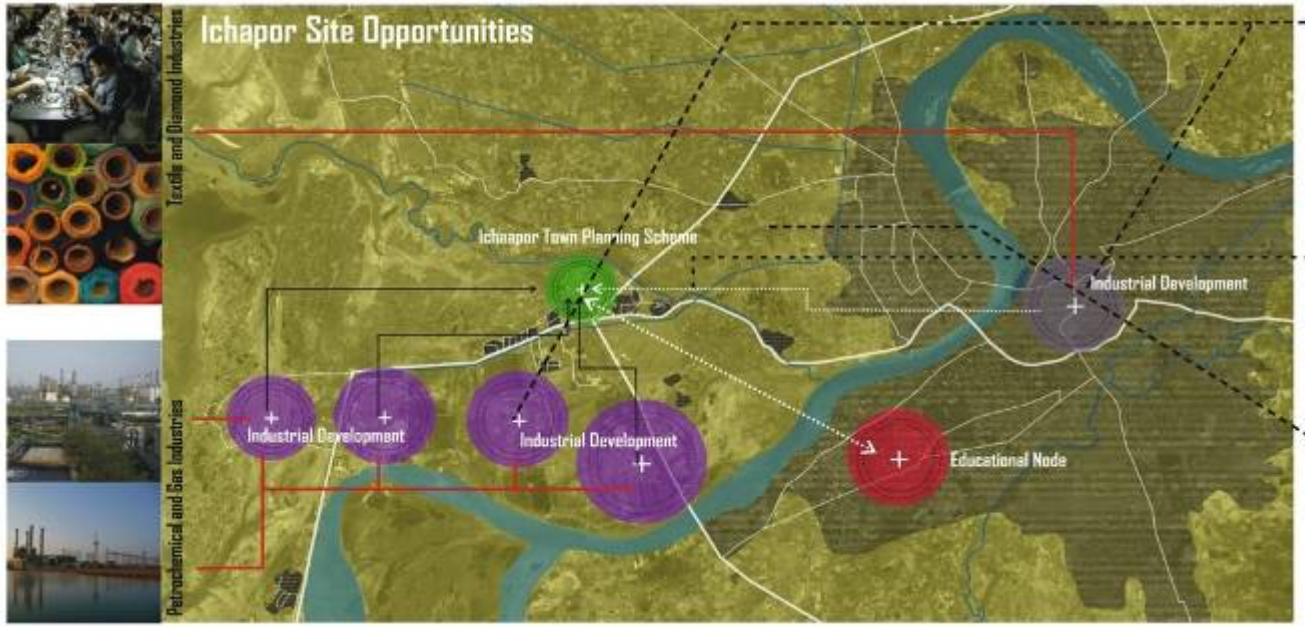


SOCIO – CULTURAL CONTEXT AND INFLUENCES

ICCHAPOR TOWN PLANNING, SURAT

ADDRESSING LAND ECONOMICS THROUGH ECOLOGY

Creating an ecology for Icchapor Site



SURAT CITY

Trade and Industry driven City
Textile and diamonds industries (small and medium scale)
Large presence of institutions and public facilities within the city (e.g. Diamond Institute)

INDUSTRIAL DIVERSIFICATION AT REGIONAL LEVEL

Attracting large scale industries specialised in
chemicals and petrochemicals
Specialisation of peripheral industrial areas

URBAN-PERIPHERAL RELATIONSHIPS

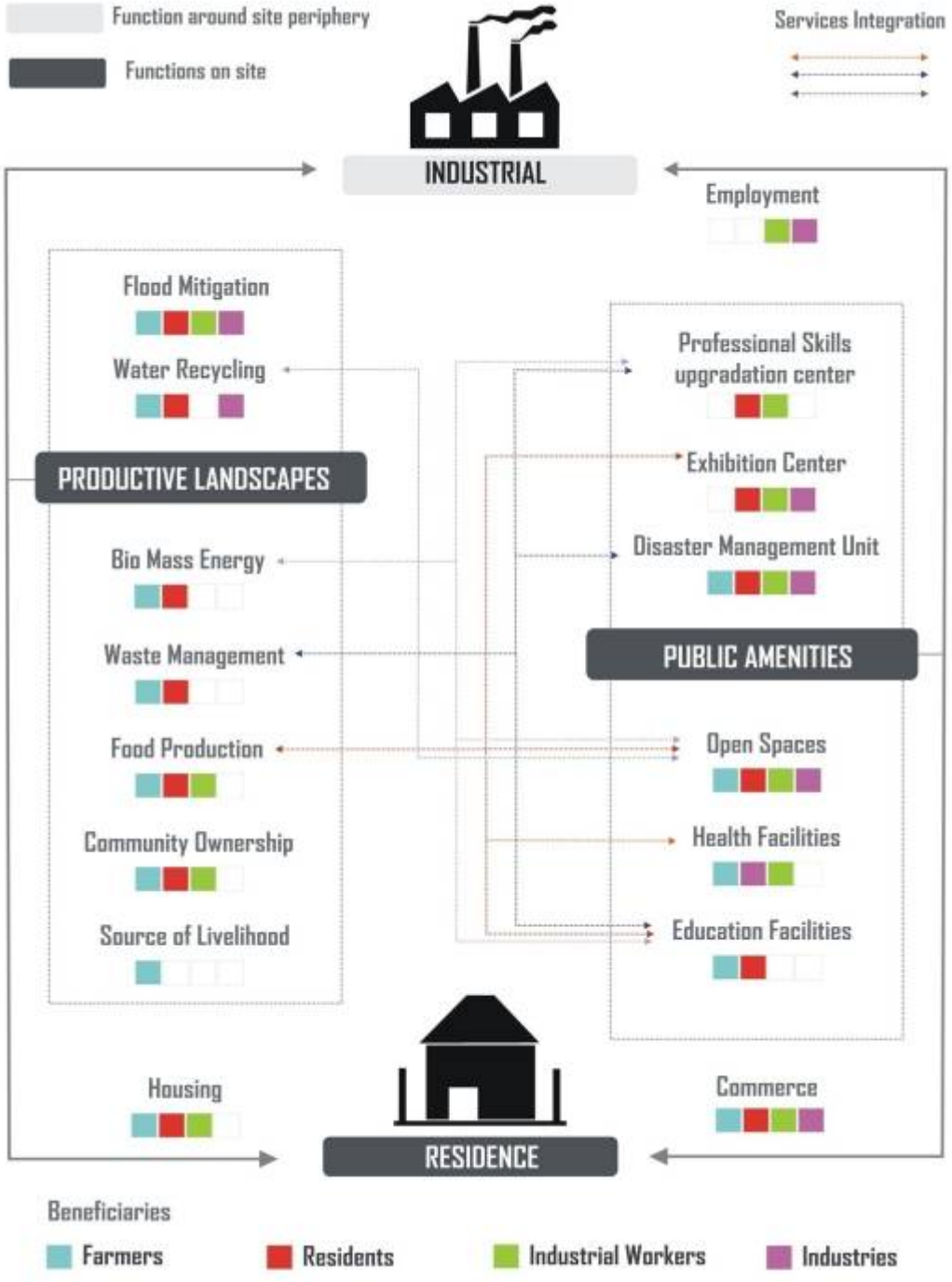
Concentration of public facilities in Surat City
Densification of the Inner city
Lack of linkage between residential and industrial areas

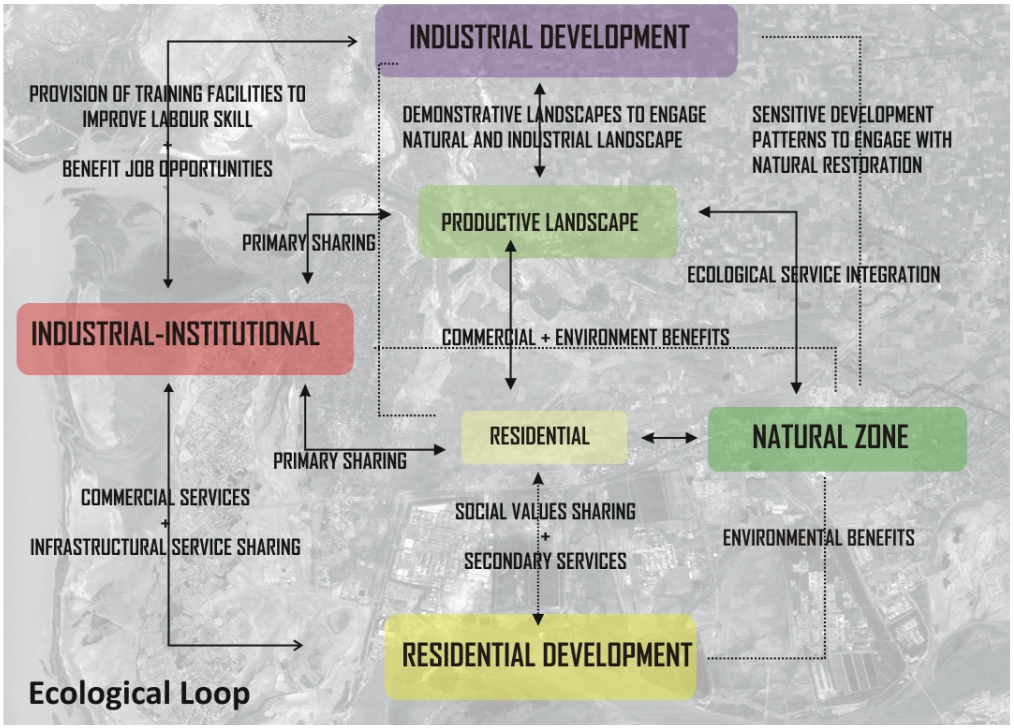
SOCIO-URBAN IMPLICATIONS

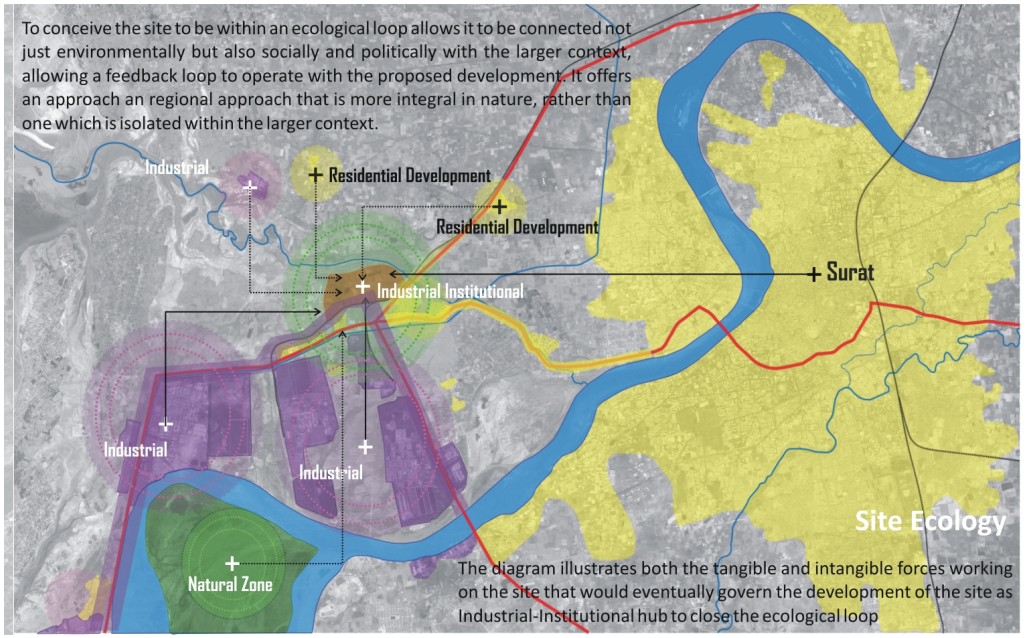
Rural-Urban migration for employment opportunities
Development of private layouts in the immediate vicinity of industrial areas

OPPORTUNITIES FOR ICHAPOR TPS

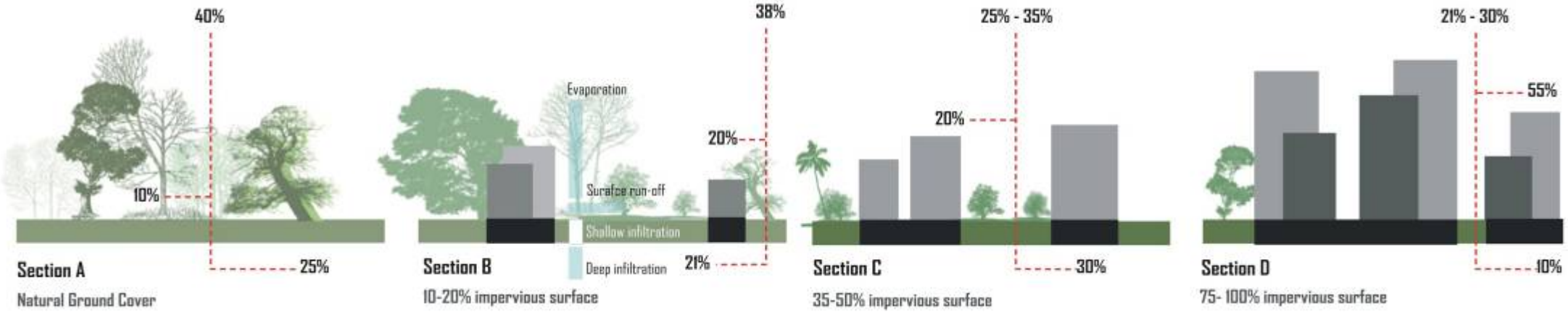
Development of public facilities, Integrated Development with industries
Creation of an amenity cluster to house incubation, vocational training and skills up-gradation center


Function around site periphery
Functions on site
Services Integration
INDUSTRIAL
Employment
Flood Mitigation
Water Recycling
PRODUCTIVE LANDSCAPES
Bio Mass Energy
Waste Management
Food Production
Community Ownership
Source of Livelihood
Professional Skills upgradation center
Exhibition Center
Disaster Management Unit
PUBLIC AMENITIES
Open Spaces
Health Facilities
Education Facilities
Housing
RESIDENCE
Commerce
Beneficiaries
Farmers
Residents
Industrial Workers
Industries


INDUSTRIAL DEVELOPMENT
PROVISION OF TRAINING FACILITIES TO IMPROVE LABOUR SKILL
+
BENEFIT JOB OPPORTUNITIES
DEMONSTRATIVE LANDSCAPES TO ENGAGE NATURAL AND INDUSTRIAL LANDSCAPE
SENSITIVE DEVELOPMENT PATTERNS TO ENGAGE WITH NATURAL RESTORATION
PRIMARY SHARING
PRODUCTIVE LANDSCAPE
ECOLOGICAL SERVICE INTEGRATION
INDUSTRIAL-INSTITUTIONAL
COMMERCIAL + ENVIRONMENT BENEFITS
PRIMARY SHARING
RESIDENTIAL
NATURAL ZONE
COMMERCIAL SERVICES
+
INFRASTRUCTURAL SERVICE SHARING
SOCIAL VALUES SHARING
+
SECONDARY SERVICES
ENVIRONMENTAL BENEFITS
RESIDENTIAL DEVELOPMENT
Ecological Loop


To conceive the site to be within an ecological loop allows it to be connected not just environmentally but also socially and politically with the larger context, allowing a feedback loop to operate with the proposed development. It offers an approach an regional approach that is more integral in nature, rather than one which is isolated within the larger context.
Industrial
+ Residential Development
+ Residential Development
+ Surat
+ Industrial Institutional
Industrial
Industrial
+ Natural Zone
Site Ecology
The diagram illustrates both the tangible and intangible forces working on the site that would eventually govern the development of the site as Industrial-Institutional hub to close the ecological loop

Water Management Strategy



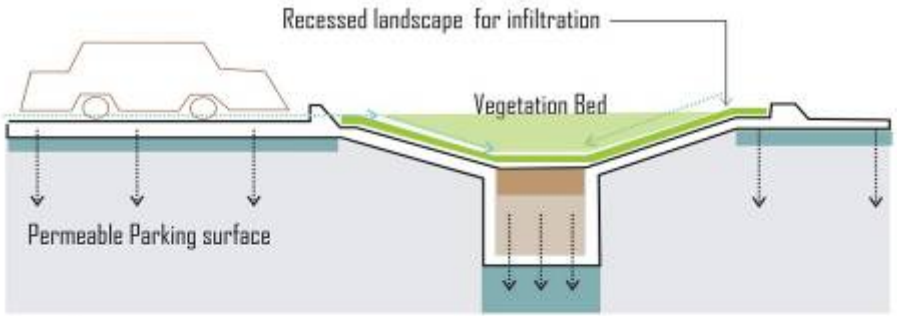


Figure A

Infiltration system

Water Management Strategy

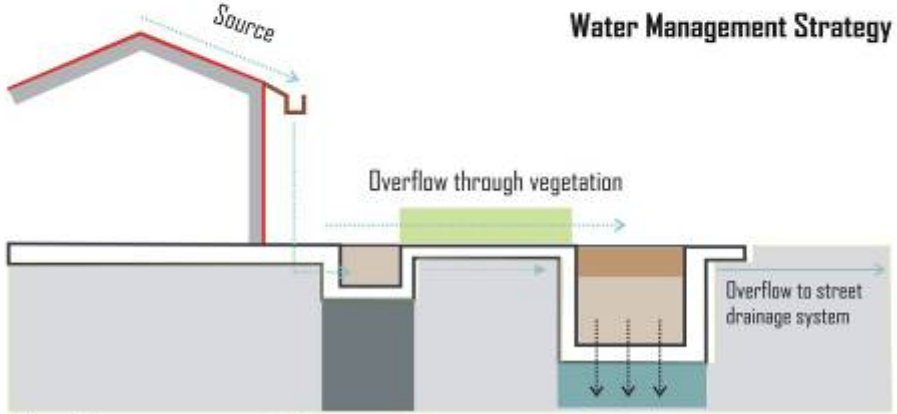
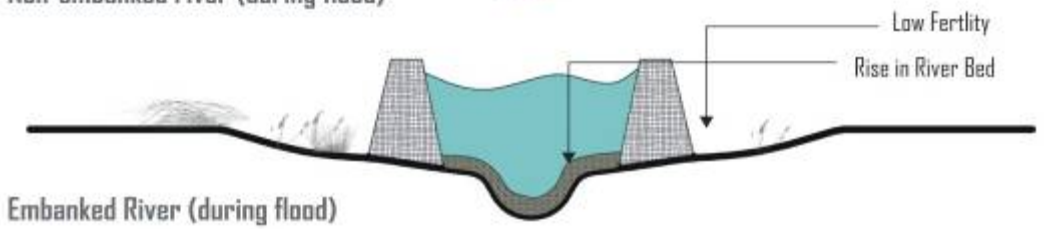


Figure B

Sedimentation Trap

Infiltration system

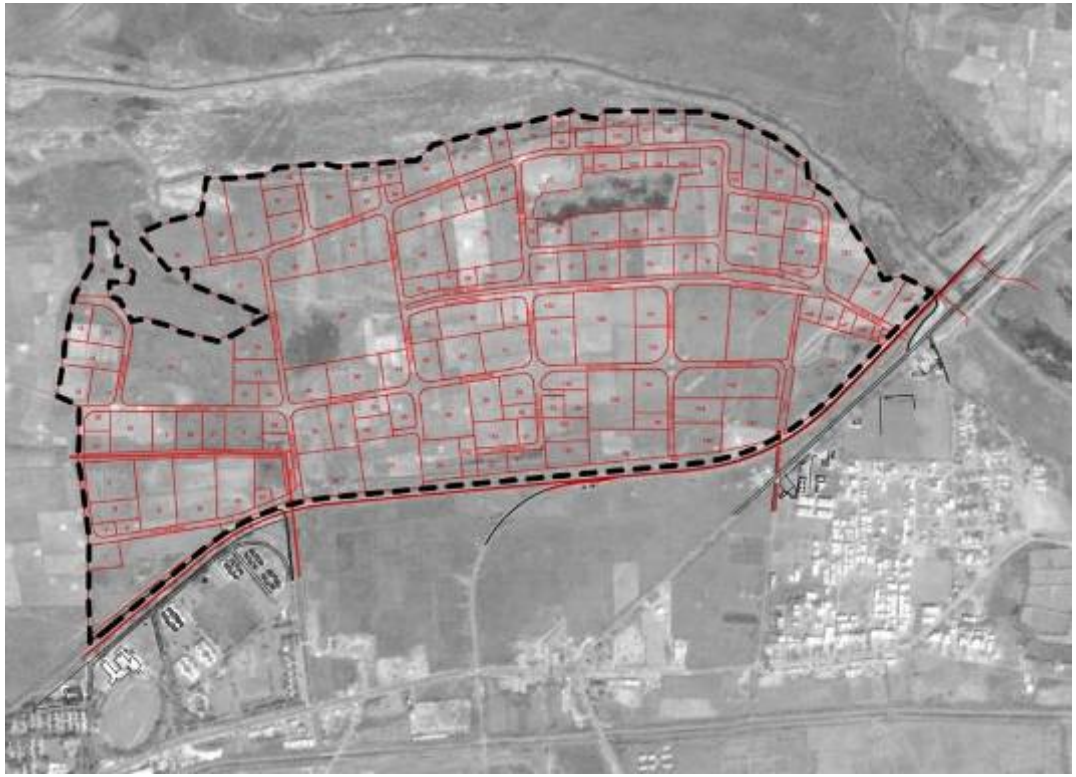


Application of TP scheme in Icchapor

Original Plots

- Located West of Surat City,
- 164 Ha
- immediate vicinity of industrial complexes
- 155 original plots.

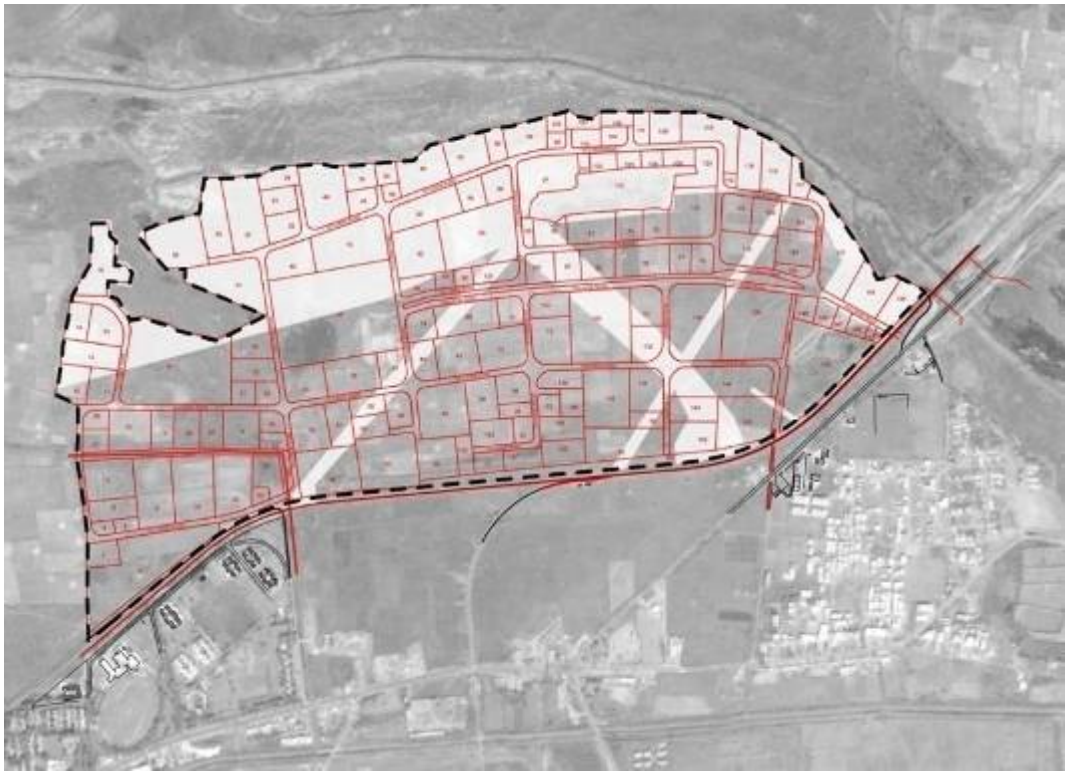
Demonstration Plots



- Laying out the roads,
- Reconstitution of final plots,
- . Every owner of the original plot gets a final plot after deduction of a percentage of land varying between 10 to 20,
- Reservation for Housing for S.E.W.S. (10%), for open-spaces (5%), social infrastructure (5%) and for sale by public authority (15 %).

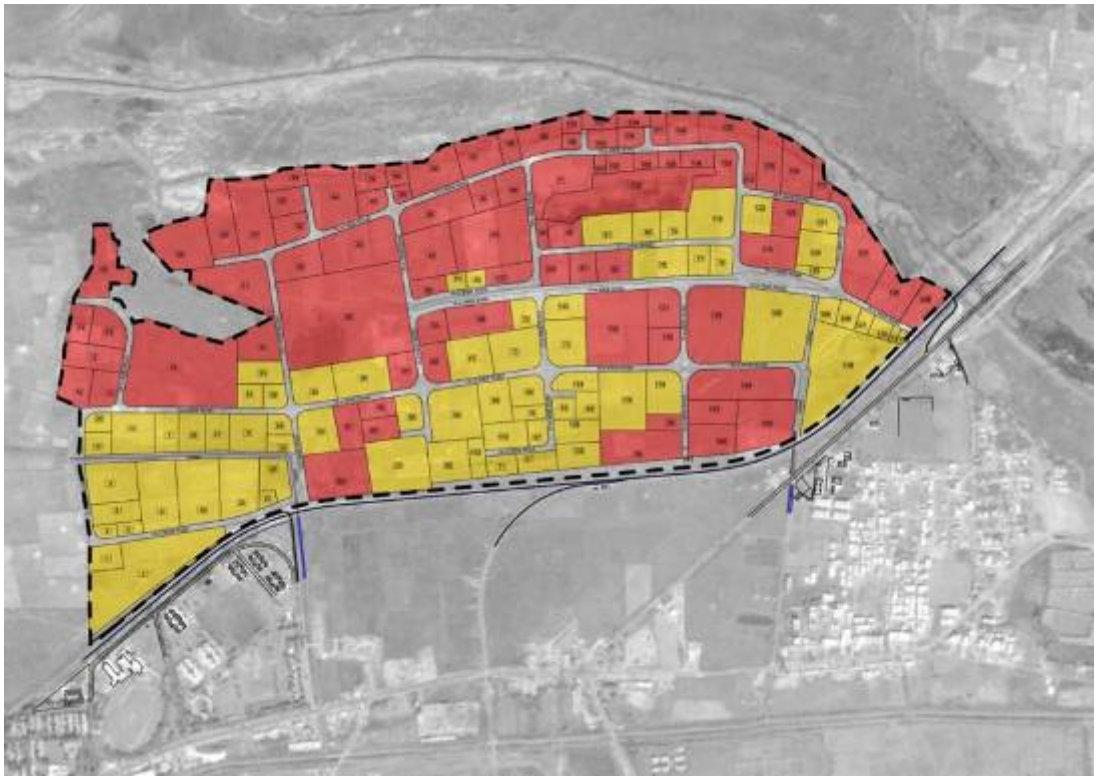
Application of TP scheme in Icchapor

Zone with High Natural and Industrial Hazard Risk



- Large portion of parcels affected by **a high degree of exposure to natural and industrial hazard risk,**
- **Disparity between owners** exacerbated by future development,
- Risk to **compromise the economic and social balance**

Land Valuation Evolution



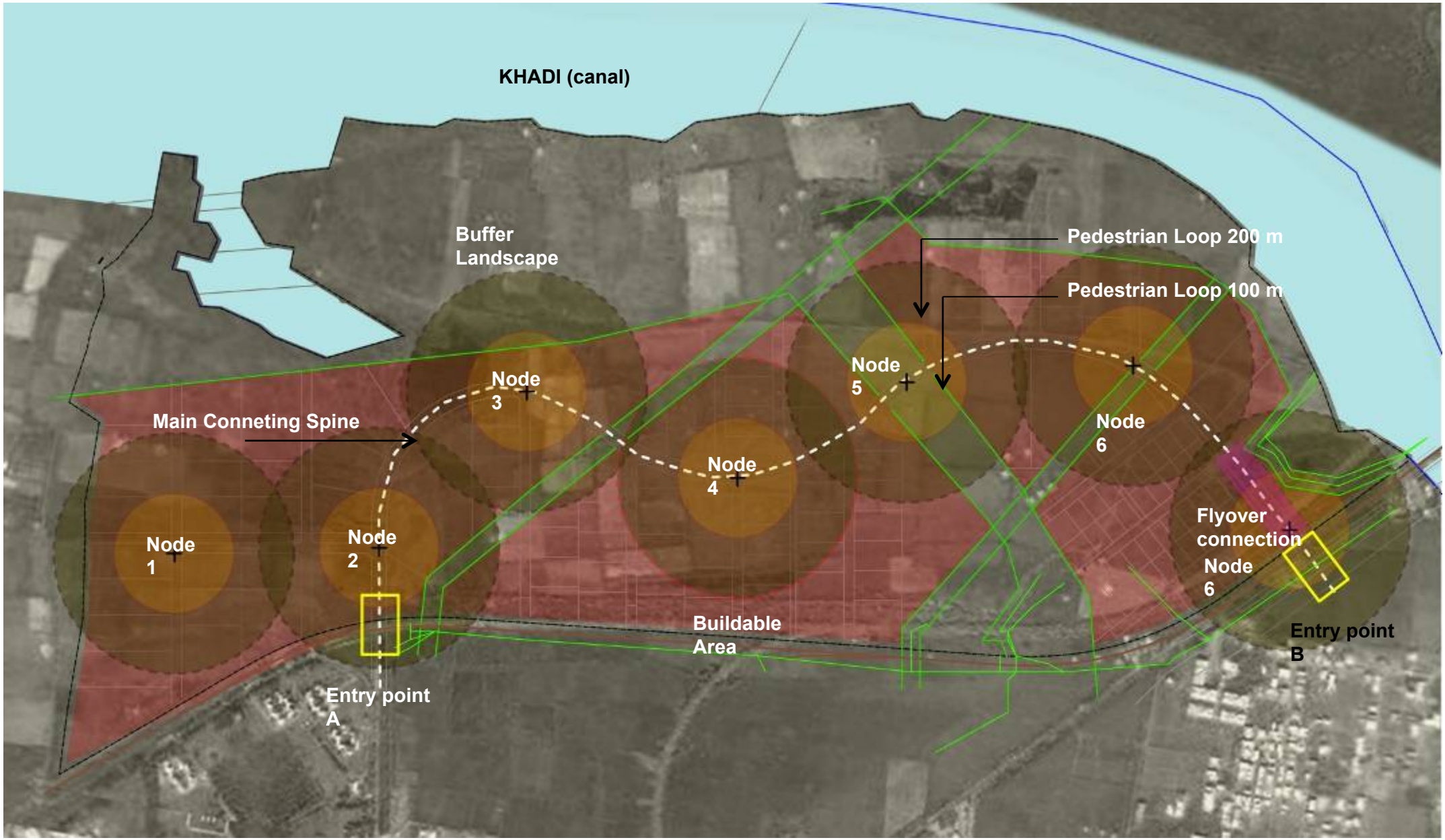
72 plots of 155 affected by a high degree of risk from industrial and natural hazards.

46 % of the owners with a decreased value of their land after 5 years compared to others.

– 23 % after 5 years for land with risk

+ 61 % after 5 years for land without risk.

Water System restructuring



Schematic Plan

Ecological Matrix

	Rainwater Management		River Edge		Open-Space		Mobility		Water Mar
	Soft rainwater management	**Drained rainwater management**	**Soft River Edge**	**Hard River Edge**	**Productive**	**"Un-Productive"**	**Soft**	**Motorized**	**Decentralized**
Design									
Principles	-Bio-swale, - Permeable parking surface, - Infiltration System	- Storm-water drainage system	- Flood plain with streamside wetland, - Gabion placement, Joint Planting	- Embankment of the river edge, - Built canal	- Urban Farming - Community sharing open-space	- Park and Playground (natural or impervious ground)	- Dedicated and secured pedestrian and cycle paths - Proximity with public Transport	- Road widening	- Phytoremediation and treatment plant, - Artificial wetland
Objectives	- Promote natural infiltration of rainwater, - Limit impervious surface	- Collect rainwater in drains	- Leave natural space to allow water spread	- Raise an artificial bank to contain / redirect water	- Plant open spaces, grow food + animal husbandry - Create non-built space	- Create non-built space for social and collective usage	- Dedicate space for pedestrian and cyclist	- Increase performance of motorized transport	- Treat and recycle water closest to its usage
Time of implementation *(1=long, 2 = medium, 3=short)*	2	3	3	1	2	1	1	1	2
Cost of implementation *(1=high, 2 = medium, 3=low)*	3	1	3	1	2	3	2	1	3
Skills Required *(1=high, 2 = medium, 3=low)*	2	1	2	1	3	1	2	2	1
Implementation Index (100)	**78**	**56**	**89**	**33**	**78**	**56**	**56**	**44**	**67**
Frequency of maintenance *(1=high, 2 = medium, 3=low)*	3	1	2	3	1	2	2	2	2
Cost of maintenance *(1=high, 2 = medium, 3=low)*	2	1	1	2	2	1	2	2	2
Skills/Materials *(1=high, 2 = medium, 3=low)*	2	3	3	2	2	2	3	3	2
Maintenance Index (100)	**78**	**56**	**67**	**78**	**56**	**56**	**78**	**78**	**67**
Run-Off Volume *(1=High, 2=medium, 3=low)*	3	1	3	1	3	1	2	1	3
Resilience *(1=High, 2=medium, 3=low)*	3	1	3	1	3	1	3	1	2
Velocity *(1=High, 2=medium, 3=low)*	3	1	3	1	3	1	2	1	3
Flexibility of the system *(1=low, 2=medium, 3=high)*	3	1	3	1	3	1	3	1	3
Downstream Impacts *(1=High, 2=medium, 3=low)*	2	1	2	1	2	1	2	1	3
Flood Mitigation Index (100)	**93**	**33**	**93**	**33**	**93**	**33**	**80**	**33**	**93**
Increased biodiversity *(1=low, 2=medium, 3=high)*	3	1	3	1	3	1	3	1	3
Erosion Prevention *(1=low, 2=medium, 3=high)*	3	1	3	1	3	1	-	-	3
Water Recycling *(1=low, 2=medium, 3=high)*	2	1	2	1	3	2	-	-	3
Waste Recycling *(1=low, 2=medium, 3=high)*	2	1	2	1	3	1	-	-	2
Absorption/Reduction of Pollution *(1=low, 2=medium, 3=high)*	3	1	3	1	3	1	3	1	3

Establishing an equitable model for development

Distinct from a regular ownership right, the Development Right encompasses the productive performance of the land, either built and non-built. Its value is hence defined accordingly to its inclusive development potential.

Productive Landscape Index

As demonstrated earlier in the ecological matrix, the productive landscape obtains a sustainability index of 87/100 while the non-productive landscape obtains a sustainability index of 49/100. (for the details of the sustainability index, please refer to the ecological matrix presented on page 9).

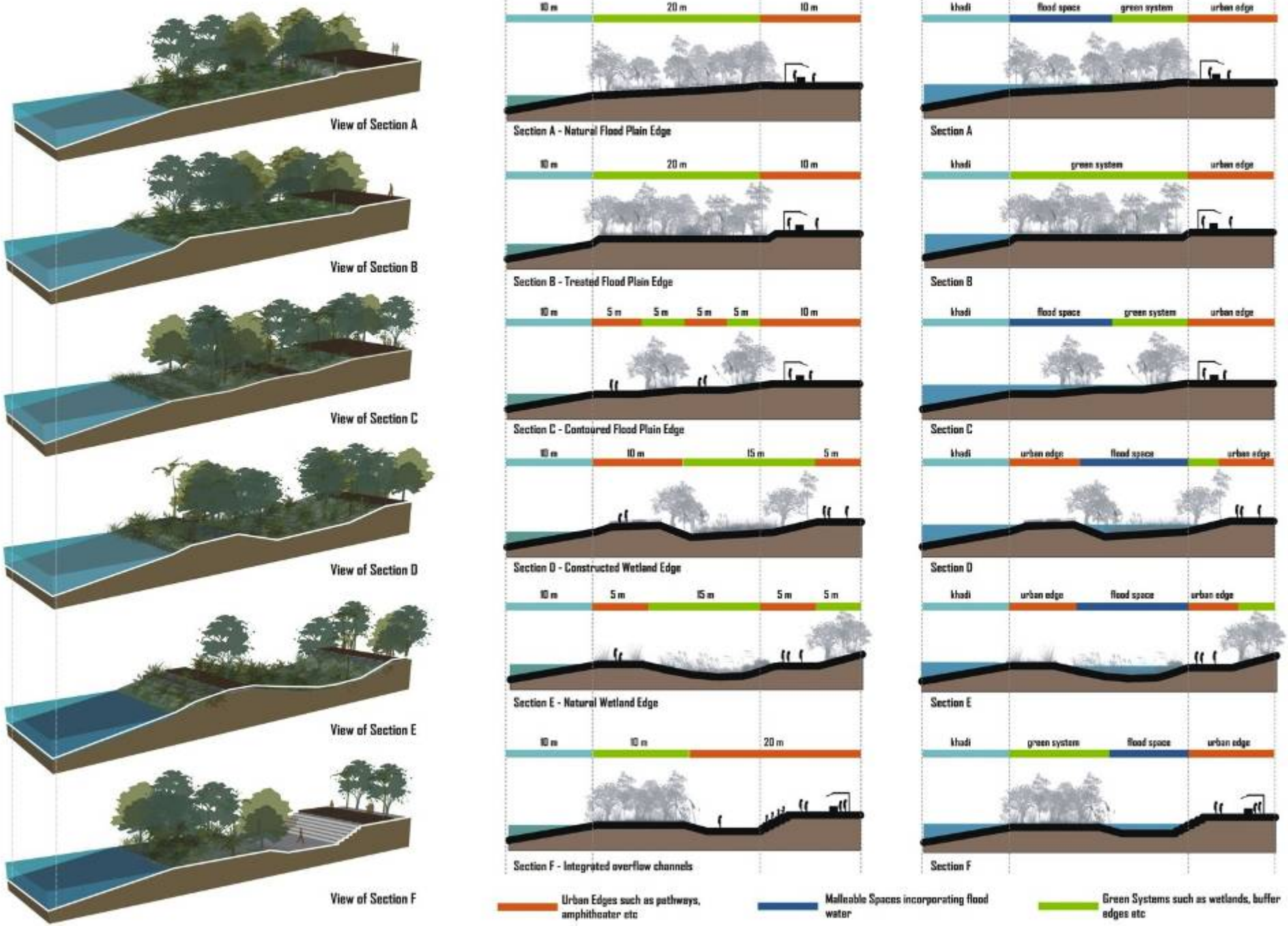
	Productive Landscape	Non-Productive Landscape
Implementation Index	78	56
Maintenance Index	56	56
Flood Mitigation	93	33
Environmental Index	100	40
Social Index	100	60
Economic Index	93	47
Sustainability Index	**87**	**49**
Added Value of Productive Landscape		**77%**

Hence, Productive Landscape has an added value of 77% compared to Non-Productive Landscape.

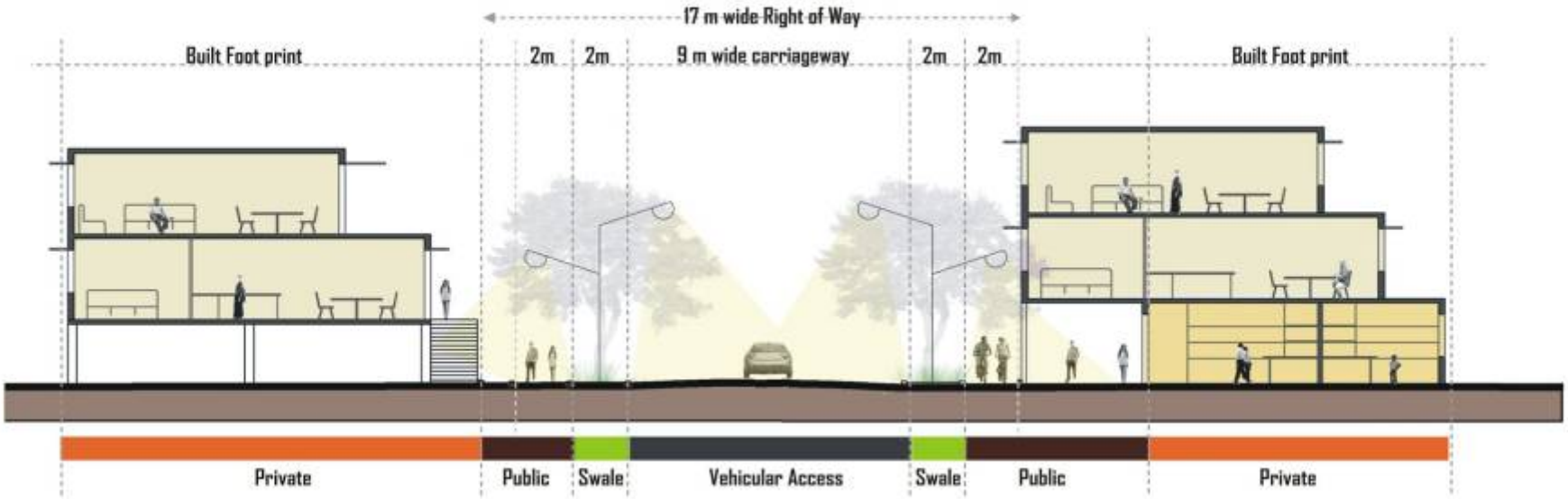
Development Right Valuation and its sharing

		Built Value	Un-built Value
		Buildable Land Value (₹)	**Productive Landscape Value (₹)**
1st Step	Global Development Right Value at Site Level	**Definition of an Average Buildable Land Rate per sq.m. at Site Level** = Cost of land + Cost of Infrastructure Development + Built-up Cost + Overhead /Taxes/Profits (40%)	**Definition of an Average Productive Landscape Rate per sq.m. at Site Level** = Cost of land + Cost of Infrastructure Development) + Productive landscape index + Overhead /Taxes/Profits (40%)
2nd Step	Individual Development Right Value	Individual Built Right (sq.m.) x Buildable Land Rate ((₹/sq.m.)	Individual Built Right (sq.m.) x Productive Landscape Rate ((₹/sq.m.)
	Total Individual Development Value	Built Value + Un-Built Value (₹)	

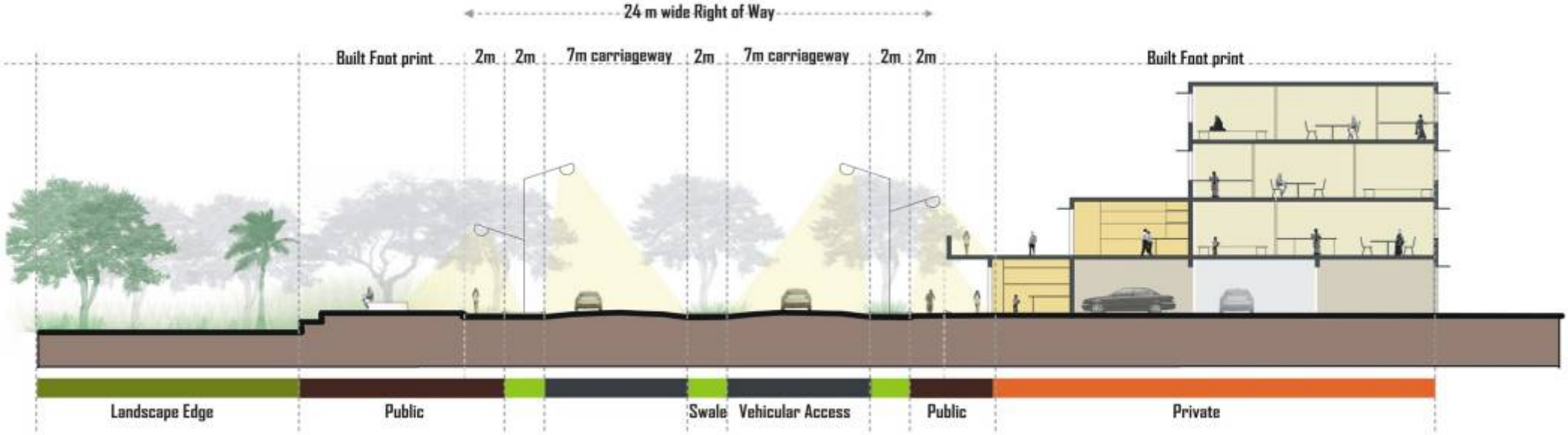
Khadi Performance - Prototype Sections



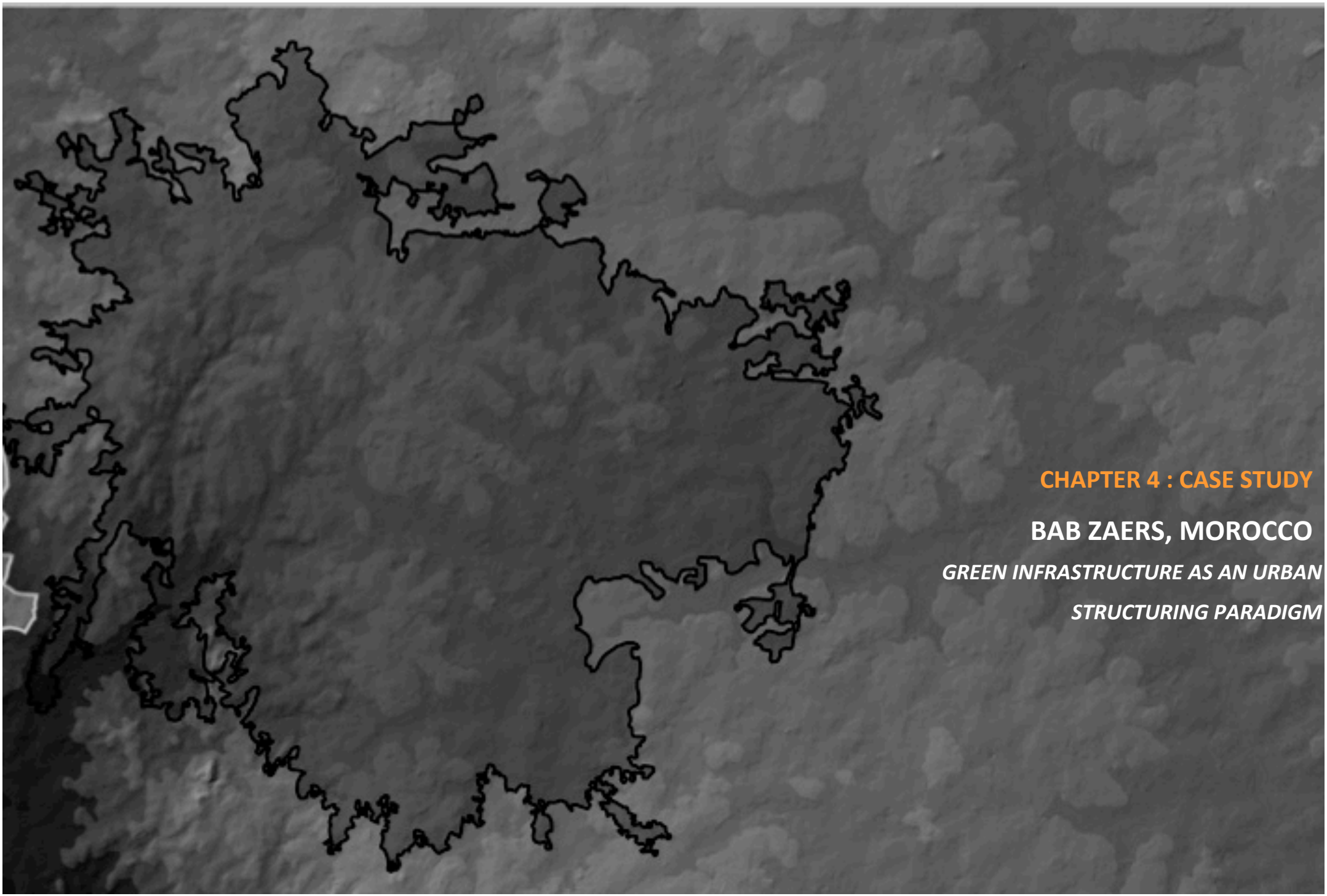
INFRASTRACTURE INTEGRATION



Section A - 17m Secondary Road



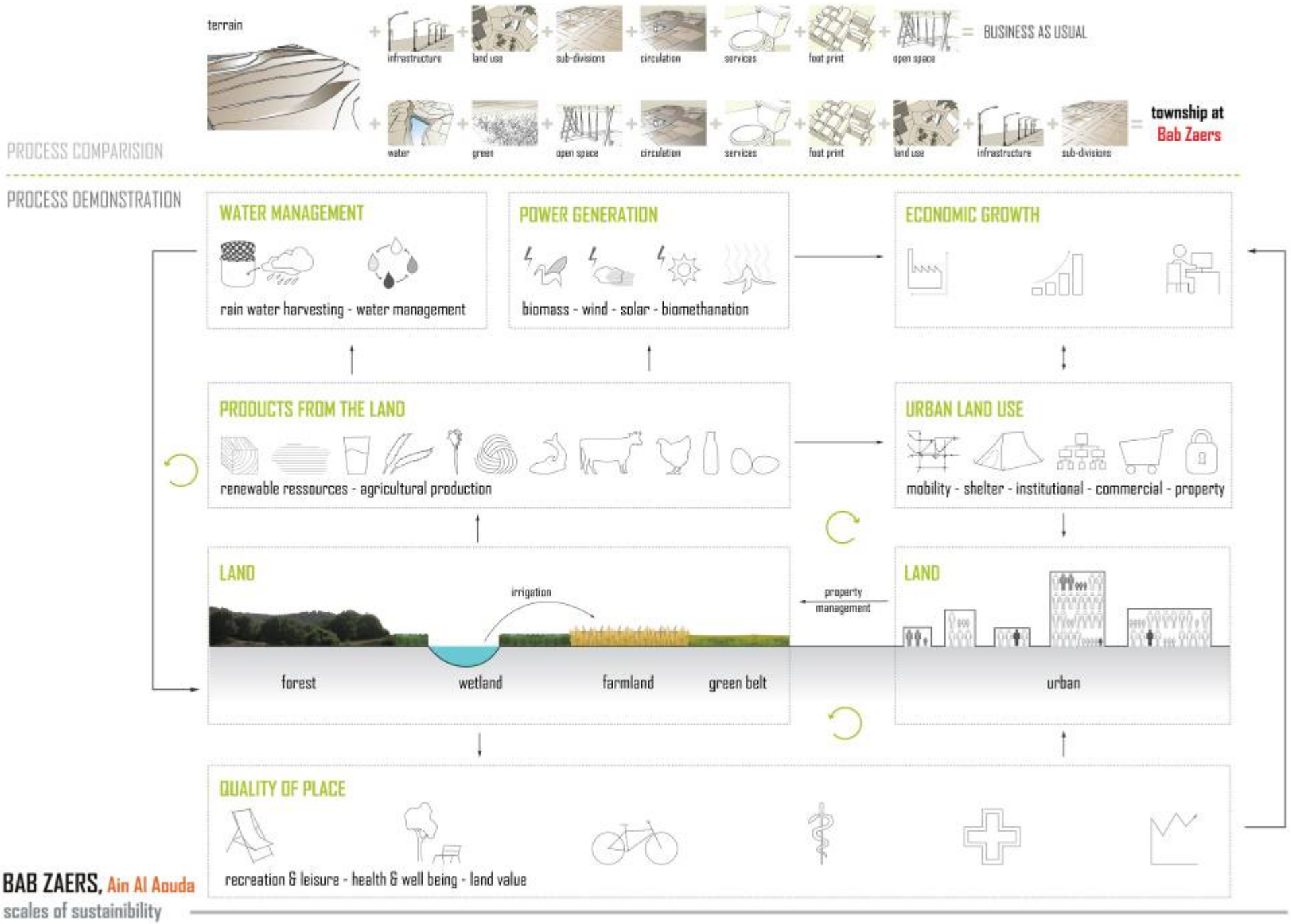
Section B - 24m wide Primary Road

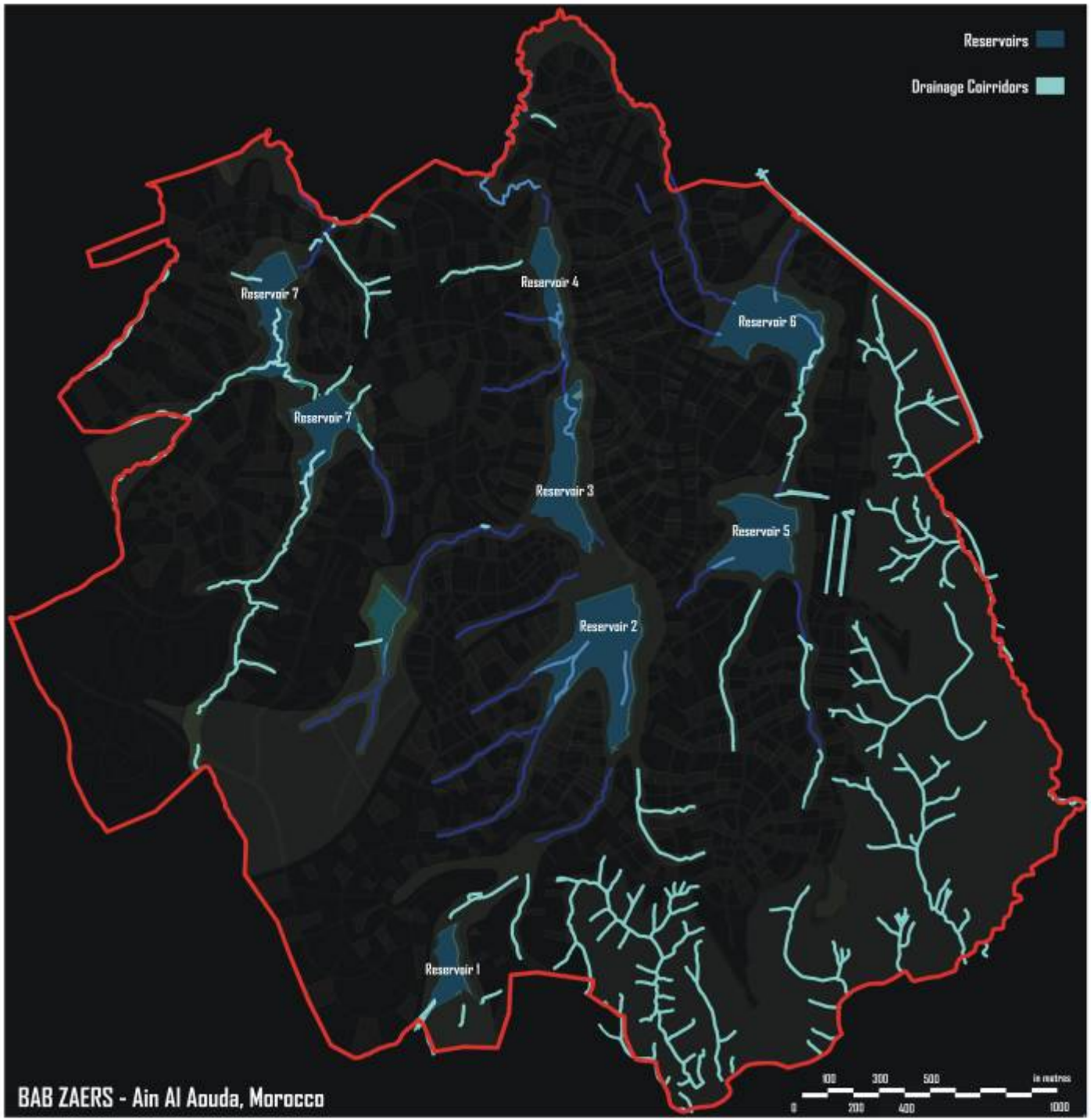


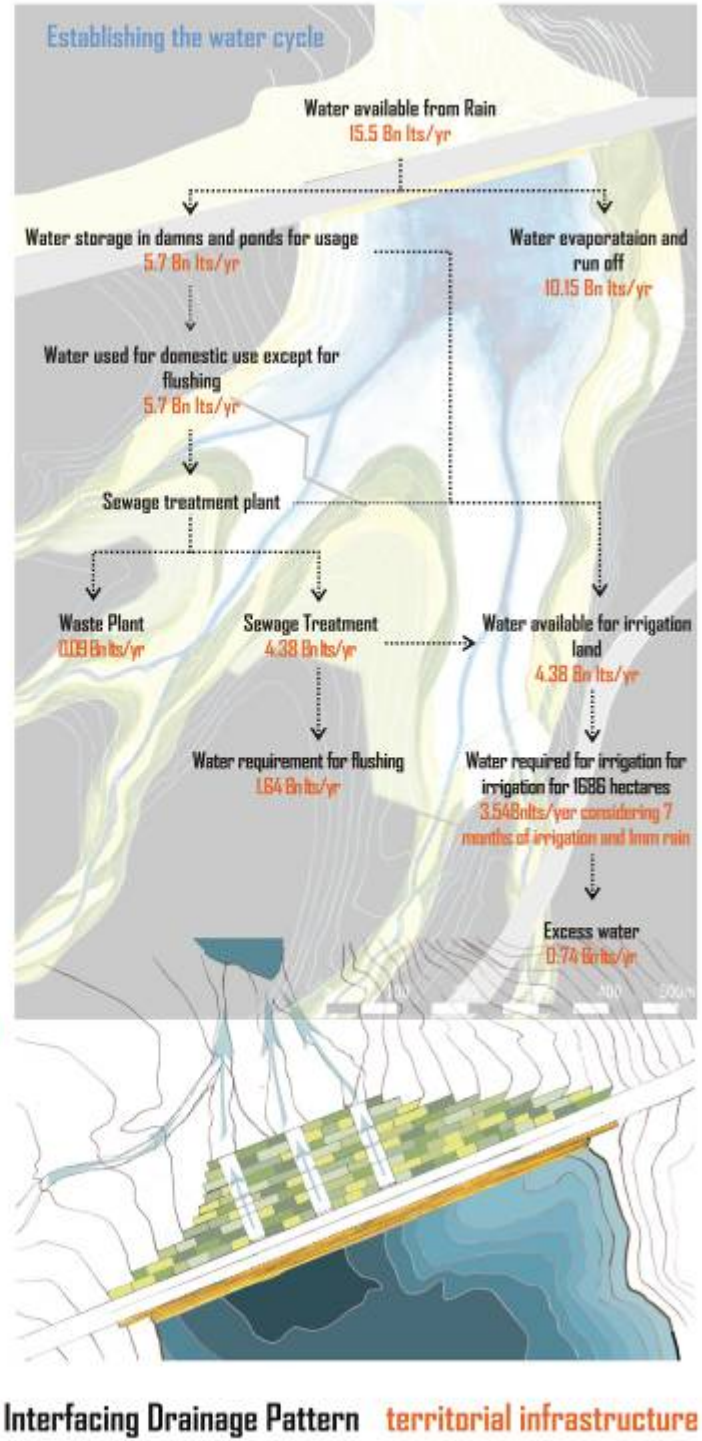
CHAPTER 4 : CASE STUDY

BAB ZAERS, MOROCCO

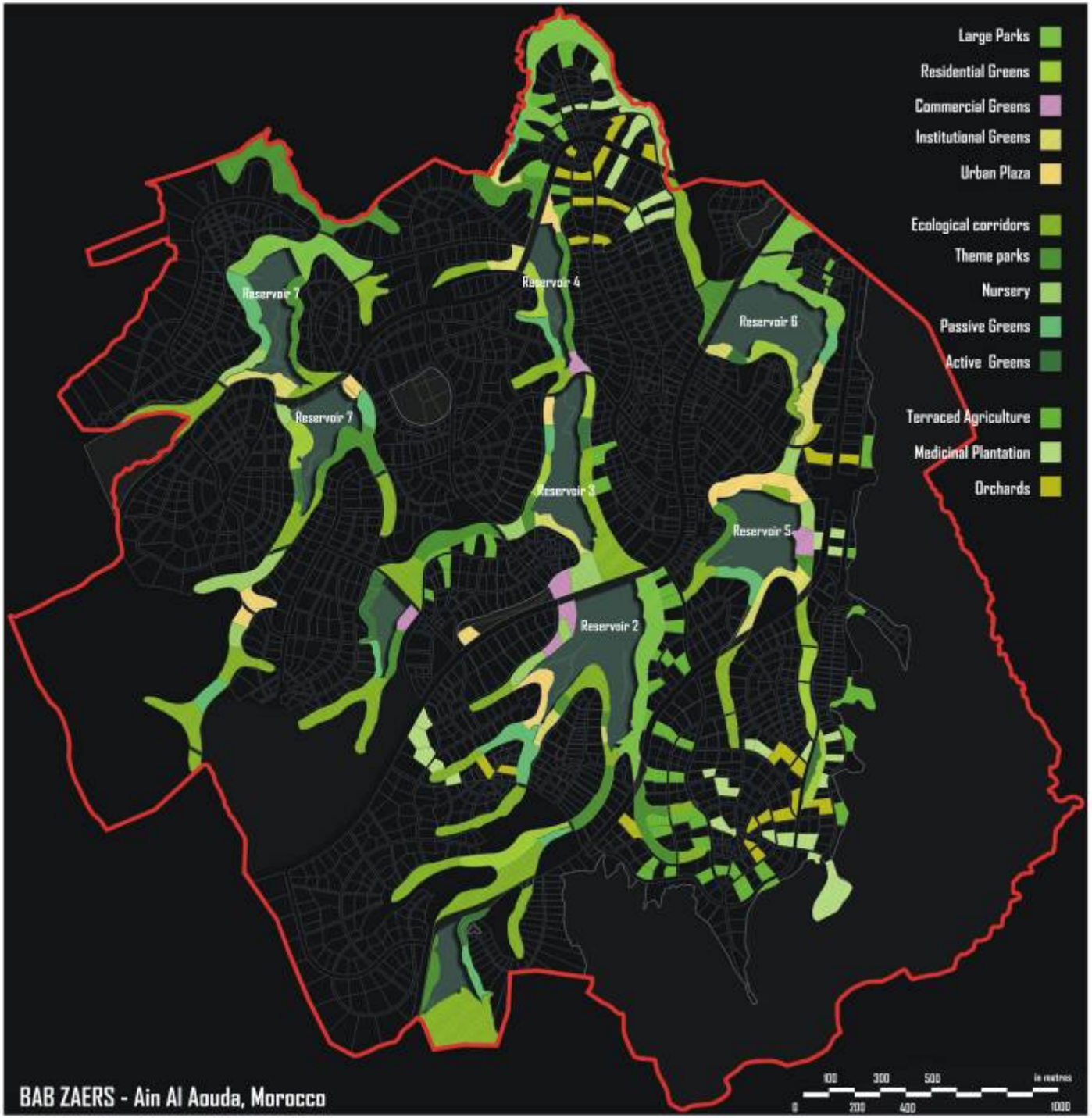
GREEN INFRASTRUCTURE AS AN URBAN STRUCTURING PARADIGM

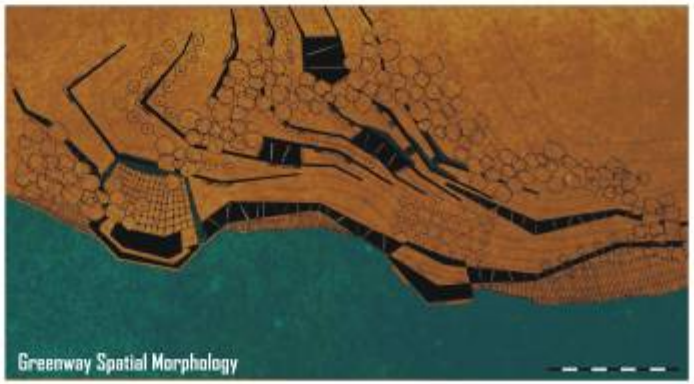

terrain
infrastructure
land use
sub-divisions
circulation
services
foot print
open space
= BUSINESS AS USUAL
water
green
open space
circulation
services
foot print
land use
infrastructure
sub-divisions
= township at Bab Zaers
PROCESS COMPARISION
PROCESS DEMONSTRATION
WATER MANAGEMENT
rain water harvesting - water management
POWER GENERATION
biomass - wind - solar - biomethanation
ECONOMIC GROWTH
PRODUCTS FROM THE LAND
renewable ressources - agricultural production
URBAN LAND USE
mobility - shelter - institutional - commercial - property
LAND
irrigation
forest
wetland
farmland
green belt
property management
LAND
urban
QUALITY OF PLACE
recreation & leisure - health & well being - land value
BAB ZAERS, Ain Al Aouda
scales of sustainibility





Interfacing Drainage Pattern territorial infrastructure





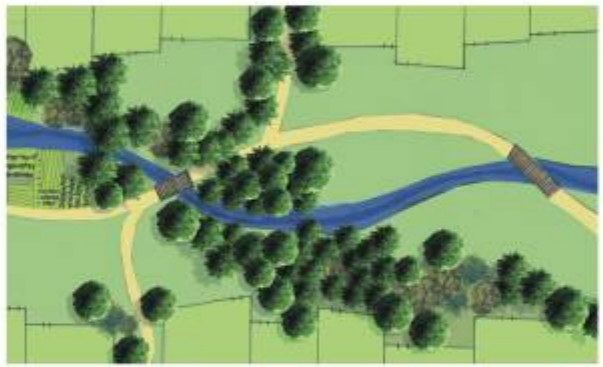
Greenways programmation - urban infrastructure

GREENWAYS

PUBLIC PARK ALONG THE GREENWAY

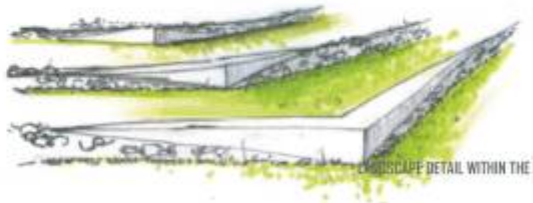
TERTIARY LINKAGES ACROSS THE RESERVOIR

GREENWAYS AS AN EXTENSION OF URBAN OPEN SPACES



RESIDENTIAL LINKAGES ALONG THE GREENWAY

DETAIL OF LAND FORMATION ACROSS THE GREENWAY



LANDSCAPE DETAIL WITHIN THE GREENWAY

BAB ZAERS, Ain Al Aouda

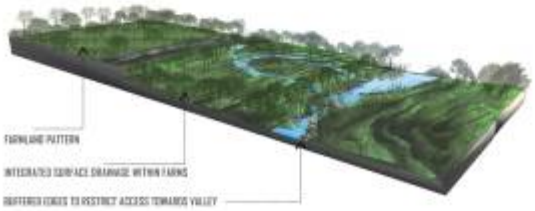
scales of sustainibility

SOCIAL LINKAGES

RESIDENTIAL GREENWAYS LAND USE TREATED AS A PASSIVE LANDSCAPE PATTERN

INSTITUTIONAL GREENWAYS LAND USE TREATED AS A EXTENSION OF THE URBAN SPACE

COMMERCIAL GREENWAYS LAND USE TREATED AS AN OPEN ENDED LANDSCAPE PATTERN



GREENWAYS ADJACENT TO FARMLANDS INTEGRATING SURFACE DRAINAGE PATTERNS

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scales of sustainibility

Pedestrian path landscape relations

Drip trays along the steps transport storm water towards the bottom of the valley and help in preventing soil erosion

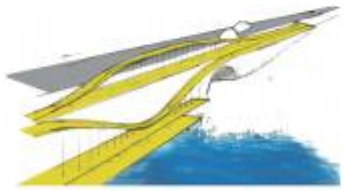
SPATIAL MORPHOLOGY THROUGH AGRICULTURAL PARCELS

SPATIAL RELATIONSHIP BETWEEN GREENWAYS AND URBAN EDGE

SPATIAL RELATIONSHIP BETWEEN GREENWAYS AND FARMLAND EDGE

Section through the valley with varying slope gradient. Where as the steep edge is treated with dense plantation to avoid erosion, the other edge engineered to accommodate social spaces such as an amphitheater

Section through the valley with moderately sloping side. One of the edges is stepped with terraces where as the other edge is uniformly sloped towards the valley

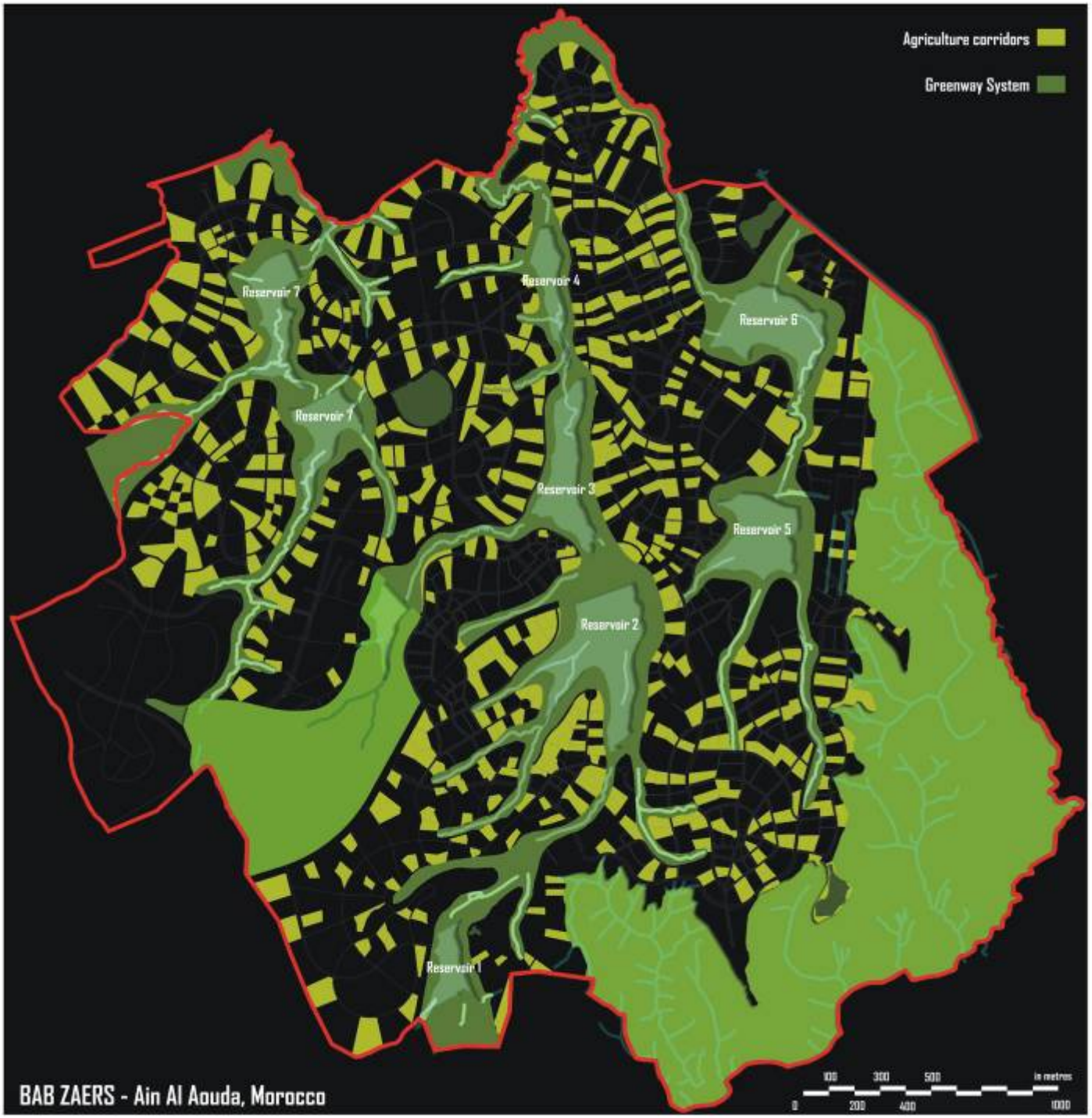


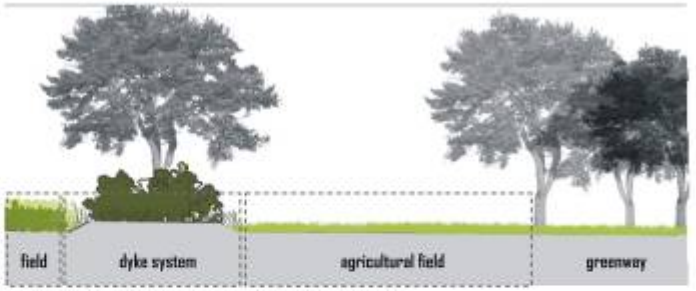
VEHICULAR ACCESS PATH ALONG RESERVOIR EDGE

PEDESTRIAN ACCESSIBILITY TOWARDS THE RESERVOIR EDGE

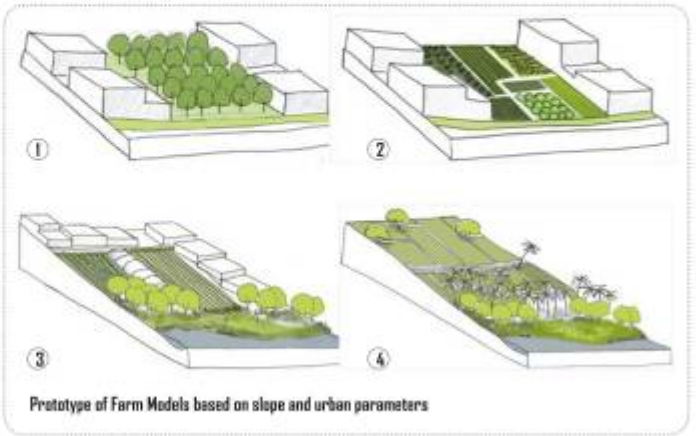
PUBLIC DECKS EXTENDING ALONG THE RESERVOIR EDGE

INTEGRATING PUBLIC MOVEMENT ALONG THE RESERVOIR



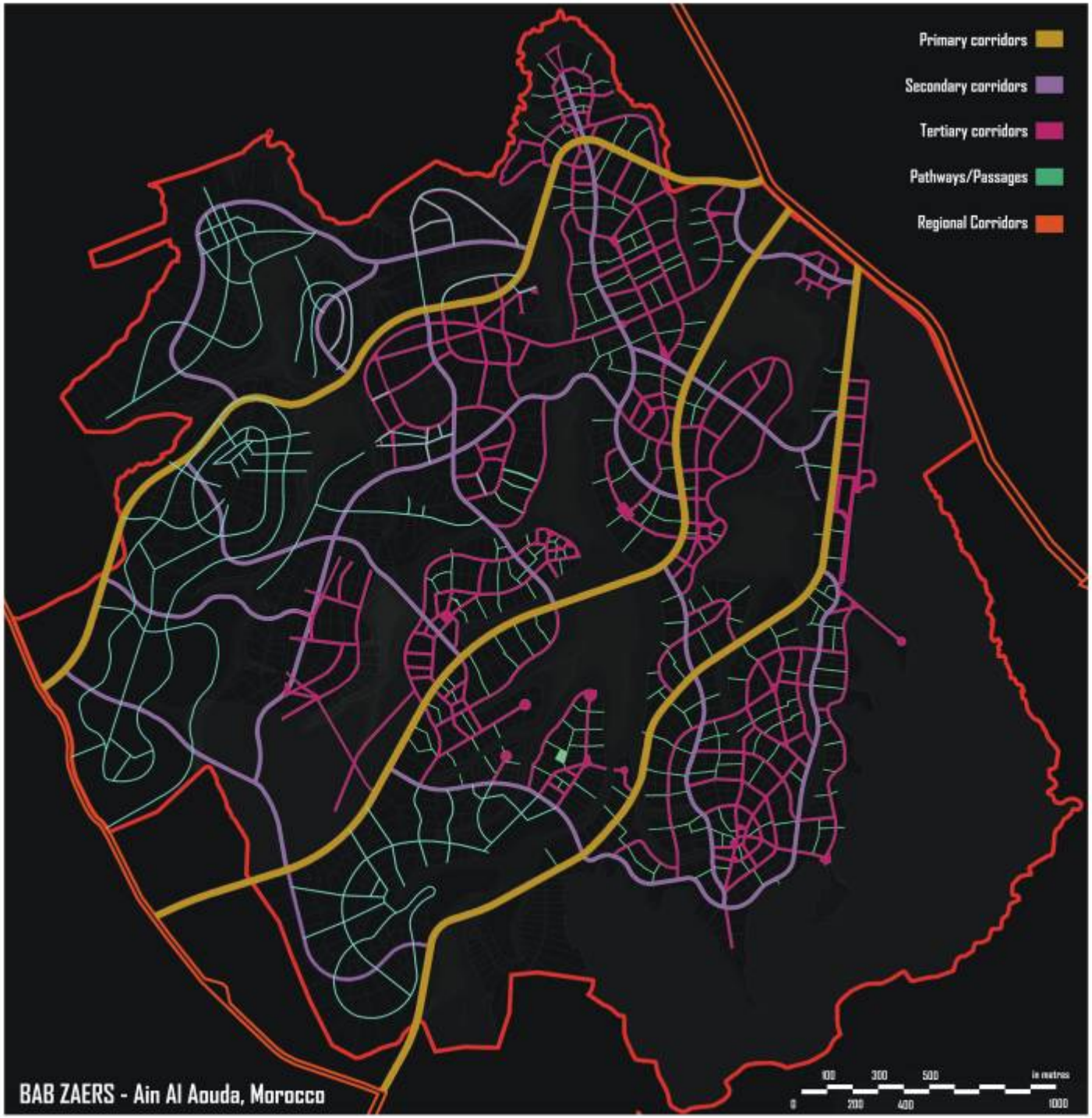


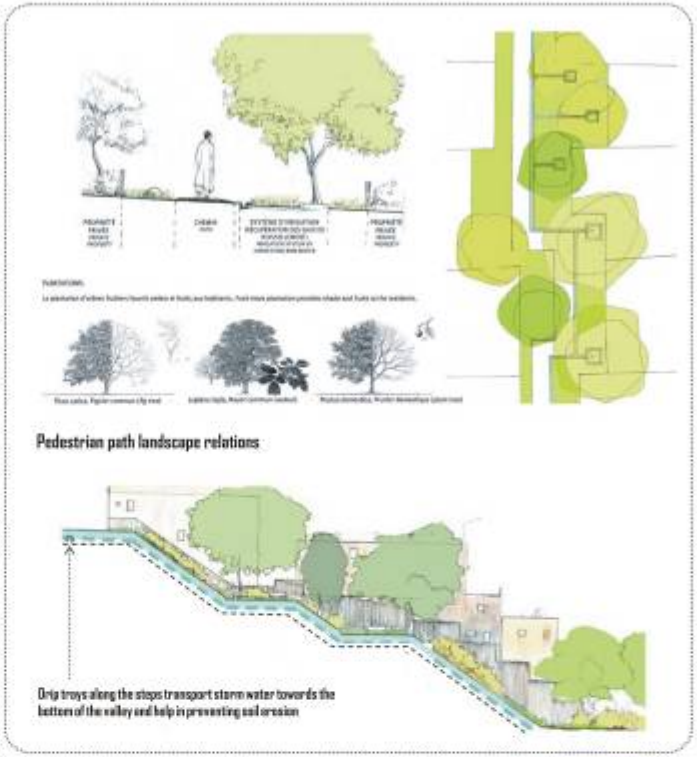
Spatial transition between agricultural fields and the greenways



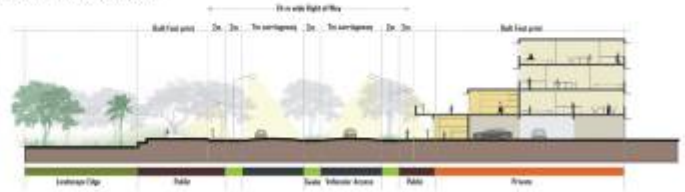
Prototype of Farm Models based on slope and urban parameters

Productive landscapes - environmental infrastructure






Section A - 17m Secondary Road


Section B - 24m wide Primary Road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Mobility corridors social infrastructure