Landscape Regeneration of Lurin Valley

Merging Heritage with Ecological Infrastructure

Abstract

The Valley of Lurin, in Lima - Peru, is characterize by its dominant agricultural activity which comes from prehispanic times. Besides being an arid territory, the prehispanic civilizations generated an efficient water irrigation system transforming the landscape into a green one suitable for agriculture. The question this research has explored is “how cities can bring back ancient local knowledge and technologies in order to solve contemporary urban problems?”.

To answer this question, the first step was to make an analysis of the prehispanic cosmovision of landscape following with a territorial and urban assessment. Secondly, identify key elements of the territory in order to categorize dynamics, cycles and problematics. The analysis shows neglection of the river and natural elements along with a disconnection with the territoral components that made its habitability possible. There is also a detachment of the cultural heritage and the agricultural identity generating fragmented landscapes and communities.
According to this, the proposal recognizes the river and the prehispanic irrigation canals, in use nowadays, as the key elements for the regeneration of the territory. The strategy consists in put in value these elements with an Ecological Infrastructure that integrates ecosystem services along the river, an Agricultural Park and an Open Spaces Network based in the irrigation canals present. With this the proposal aims to generate awareness of the cultural heritage that the agriculture represents in the territory along with its direct connection with the components of it.

The project strategy invites to explore sustainable urban developments that intend to involve the stakeholders with their territory, culture and heritage. Leaving behind current unsustainable models giving space to new ones that value the traces of the past in order to build a sustainable future.

Keywords: Heritage, urban agriculture, irrigation, sustainable landscape, river

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01. Introduction to Context

The Notions of Landscape

What is Landscape?

Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors (European Landscape Convention, 2000). Combining both their physical origins and the cultural overlay of human presence, often created over millennia, landscapes reflect a living synthesis of people and place that is vital to local and national identity. Therefore this particular landscape located in the coastal desert of the Peruvian Pacific coast is the the consequence of thousands millions of years of natural phenomena and the perpetual inhabitation of the territory for at least 10,000 years.

The Collision

Lurin Valley has been inhabited by important prehispanic civilizations including the Inca Empire until the beggining of the Spanish Colonial Period in the XVI century. The Andean civilizations shaped drastically the landscape mainly by transforming their natural environment into an highly efficient agricultural landscape.

This particular territory in the new world was home to a civilization and a way of thinking that evolved undisturbed for thousands of years. If the landscape is defined by the perception of the mind of the subject which reads the landscape, this will be heavily influenced by the cultural mindset of his culture. After colonization, the Western mindset arrived and by this a new way of understanding the landscape was imposed by the new rulers.

The Western notion of lanscape which evolved from Europe and its a consequence of its particular geography varies from the Andean notion which developed locally for thousands of years. The subject, the human being, is separated from the object, the nature and acquires protagonism. This anthropocentrism was justified by religion that saw the man as the image of God and nature as his subordinate. With the expansion of the European culture to America and the rest of the world this idea of division remained. In addition to that, the concept of "modern progress" saw the natural environment as a source to get the resources for the human well-being (Crousse 2019:145)

The andean vision of the world is immanent in which everything is a living organism and there is no separation between human being and nature; the human being is a life form of nature as it is the soil, the mountains, the stars, the gods and even the artifacts and human actions (Crousse 2019:30). Their relationship of prioritizing efficiency and not exploiting more resources than needed shared contemporary sustainabilty principles.

The main difference is in the way in which the subject relates to the landscape; the Western model suggests a subject-object relationship between the observer and landscape and the Andean model suggests that there is no distinction between these by all being part of the same. This huge gap in the understanding of the landscape was responsible mainly for the way in which the humans intervene in the landscape and in new classifications of landscapes.

The Region

The landscape in Peru is one of the most unique and diverse in the world. Most of its diversity derives from the physical processes that has sculpted this territory for millions of years. The Andes are the result of tectonic plate processes, caused by the subduction of oceanic crust beneath the South American Plate. This process is generated one of the most impressive mountain ranges in the earth.The Andean range extends for almost 7,000 km from north to south of the continent and has an average height of 4,000m. The magnitude of this mountains is responsible creating a wide range of climates and ecosystems along its extent and altitude.

Peru in the Central Andes contains many of this diversity. Its territory can be divided in three geographical regions: Coast, Mountains and Jungle. The landscape in study is part of the coastal region and is characterized by its arid climate. The high altitude of the Andean Range prevents the precipitation of the Trade Winds of the Equator to reach the pacific coast. Therefore, the west flank of the Andes suffers from very low precipitation in contrast with the very humid Amazon Rainforest in the east flank. This conditions develop a coastal desert that stretches along the totallity of the Peruvian coast. The only source of humidity and water is the evaporation from oceanic breeze and the rivers that originate in the snowy peaks. Human presence had to learn to inhabit this hostile territory by settling in valleys in proximity to this rivers and by taking advantage of the subterranean waters.

Metropolitan Lima and the Problematic

The Metropolitan City of Lima is conformed by the watersheds of the rivers Chillon, Rimac and Lurin that start in the peaks of the Central Andes. The city´s area is composed by the coastal litoral, the valleys, the desert plain and the andean foothills up to 850 m.a.s.l.

It has a population of 9' 320, 000 inhabitants (INEI, 2018). A number that represents almost 1/3 of the national population in a territory that is barely 0.22% of Peru´s total area. This becomes evident in the horizontal urban sprawl that is continuosly growing in the three valleys and that in the process had already urbanized completely the Rimac Valley and a major portion of Chillon Valley wihtout major concern of the water cycle or the environment. In that scenario the agriculture activity that was predominat in the valleys since prehispanic times had been seriously affected.

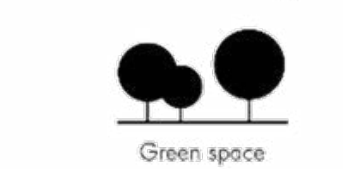
Nevertheless, the city presents an extraordinary heritage and knowledge from civilizations that could transform the arid desert with low water resources into a productive area through techniques and territorial management based on understanding their landscape.

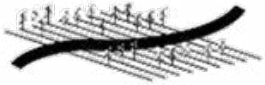
Lurin Valley as an Opportunity

Lurin Valley nowadays is the one with more concentrated agricultural areas (MML, 2014). Besides the constant threat of urban expansion it had mantained the agricultural scenario still on going. It is also the greeneast area near the metropoli which lacks of public space. How ever, the agricultural activity along the valley is decaying. With an inneficcient water management and a lack of primary production development it became more difficult for the farmers to mantain their land. In addition to that, there is no diversity of economic income for the population as well as a bad road connection across the valley which also makes difficult to enhance the touristic sector.

The valley also represents an important archeological location with the Pachacamac Santuary, temple of the former Coastal God of the prehispanic civilizations. The presence of this deity in the site gave place to the most important cermonial urban development in the prehispanic Peruvian Central Coast (Canziani xxx, 48) and nowadays gives the valley an invaluable heritage layer directly connected with the agricultural activity that was the main tool of landscape transformation.

Therefore, an intervention in the Lurin Valley represents an opportunity to give the city public green space, enhance the agricultural activity and protect the heritage value from a new vision of sustainable development.





The Sense of Place

The Architect and Urbanist José Canziani mentions that, in the "Plan de Manejo" (Management Plan) to designate the Pachacamac Sancturay as a UNESCO World heritage, it was considered that the extraordinary history of the place and its relevance today can not be conceived without its special integration with the territory and the landscape. This is beacuse the sanctuary structures were organized and built in armony with the elements that compose the landscape.

"...from its origins, the structures were placed in an strategic location, from where it can be strablished a visual dominance of an armonic group of landscape components allowing to see in this way the coastal litoral, the river and the agricultural valley of Lurin as also the desert plain and the foothills... " (Canziani xxx:48)

It is also mentioned other components as the islans, the wetlands, the riparian forest and the lomas ecosystem.

02. Methodological Approach

Research

A recollection of information regarding the Prehispaninc Landscape, their territorial occupation and the strategies used to transformed their territory is made. In addition to this, a reseach in contemporary landscape strategies and water management tools was also studied.

Analysis

The Analysis is based in understanding the heritage as an structurant element of the landscape composition and its value towards the design. Therefore it is divided in understanding:

1. The Landscape System: The spatial, historical and so cial analysis.

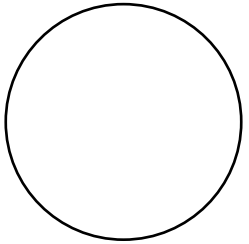
2. The tangible and Intangible Values: The inherent values in the valley, the spatial characters, the attitudes towards change, the identification of what is protected and the relationship with the stakeholders.

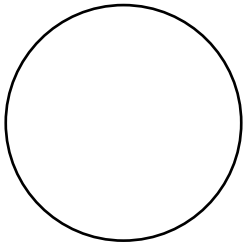
Proposition

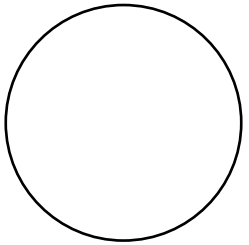
Divided in three stages; macro-scale, medium-scale and micro-scale to show the different scopes of the design steps.

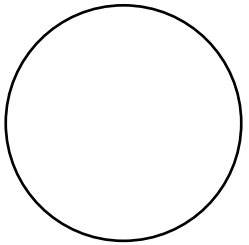
Conclusion

What was learned and suggestions for future researchs.









03. Reading the Landscape System

03.1 The Lurin River Basin

03.1.1 Spatial Analysis

Location

The Lurin River Basin is located in the south part of Metropolitan Lima occupying the political area of two provinces, Lima and Huarochiri. Geographically it is located on the western flank of the Western Andes. The basin has a drainage area of 1658.19 Km^2 with a perimeter of 257.53 Km and an average slope of 4.76% (ANA 2004, 27).

Geomorphology and Hydrogeology

The basin contains 6 geomorphologic units identified by their altitude: The Valley, Hills, Andean Foothills, High Andes, Plateau and Snowpeaks.

In addition to that, 6 types of hydrogeologic units are present in the whole basin. A Porous Aquifer present in the Valley, a Fisured Aquifer present in the Desert Plain, Intrusive Aquitard in the Hills and Andean Foothills, Volcanic Cracked Aquifer and Sedimentary Volcaninc Aquitard and Volcaninc Aquitard in the Plateau and parts of the Snowpeaks.

According to the Autoridad Nacional del Agua, ANA, (National Water Authority) the basin morphology favors a good water retention (ANA 2004,40).

Lurin River

The Lurin River has its orgins in the snowy peaks of the Surococha Mountain at 5,300 m.a.s.l. starting first with the name of Chalilla River. Then it changes its name to Lurin when the waters of Taquia River combine with it. From there the river continues its course until the Pacific Ocean. In this process 10 sub-basins can be identified according to their physiographic and hydrologic characteristics (ANA 2004, 29). The Lurin Lower Basin from 0 m.a.s.l to approximately 200 m.a.s.l., near the Pacific Ocean, it´s where the study site is located.

On the Final Report ANA eloborated in 2004 for the basin it was stated that it can be divded in two hydrologic sectors: Dry Basin and Humid Basin. The Lower Basin is located in the Dry Basin which meanst he rain precipitations in this zone are practically nil (ANA 2004, 41).

Water Cycle

The Lurin River gets its water from the andean parts in the rainy seasons from january to march and lower down in april. From june to august precipitations are low. The Lower Basin is highly influenced by the andean rainy season the high humidity levels present in the winter fog.

Climatic Zones

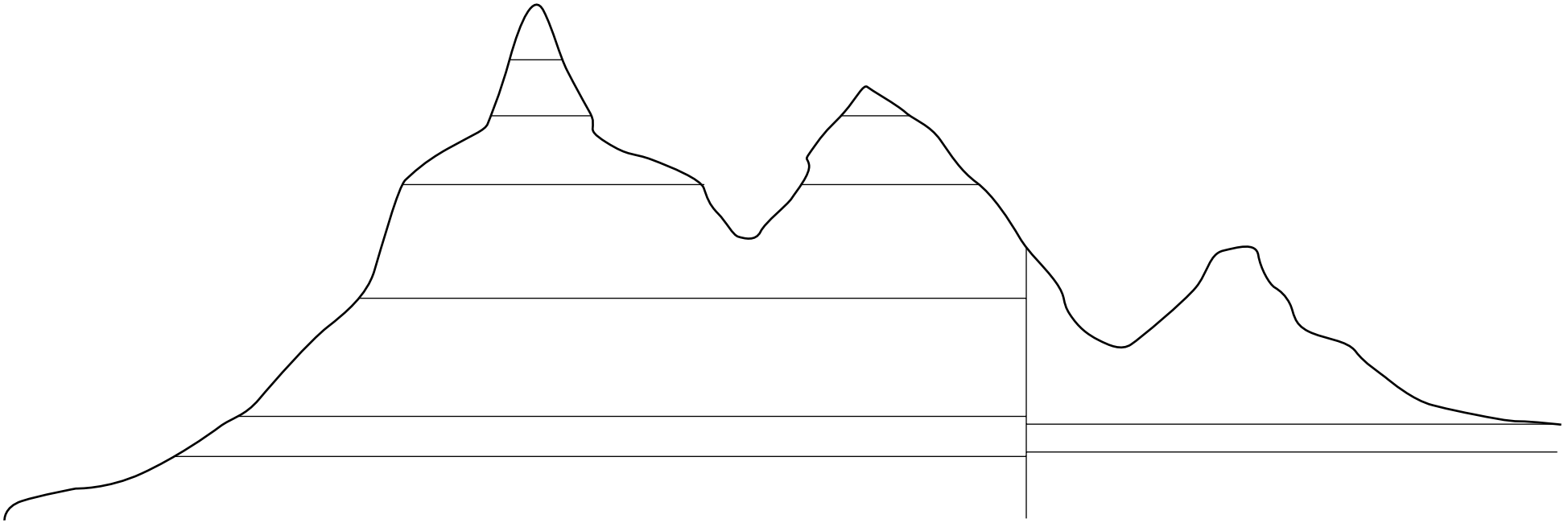
The climate is directly link to the altitudes along the basin. According to that parameter 6 Life Zones (IDMA 2001). According to that division, the Lower Basin presents a desertic climatte conditions with low presence of rain.

Lifes Zone	Altitude (m.a.s.l.)	Anual Average Temperature (C°)
Subtropical Desert	0-800	18.60
Subtropical Desert Scrub	800-2200	18.00
Low Montane Thorny Steppe	2200-3200	14.40
Montane Steppe	3200-3800	10.00
Very humid Sub-Alpine Paramo	3800-4800	5.00
Alpine Rainy Tundra	4800-5000	2.00

Natural Regions (Ecological Floors)

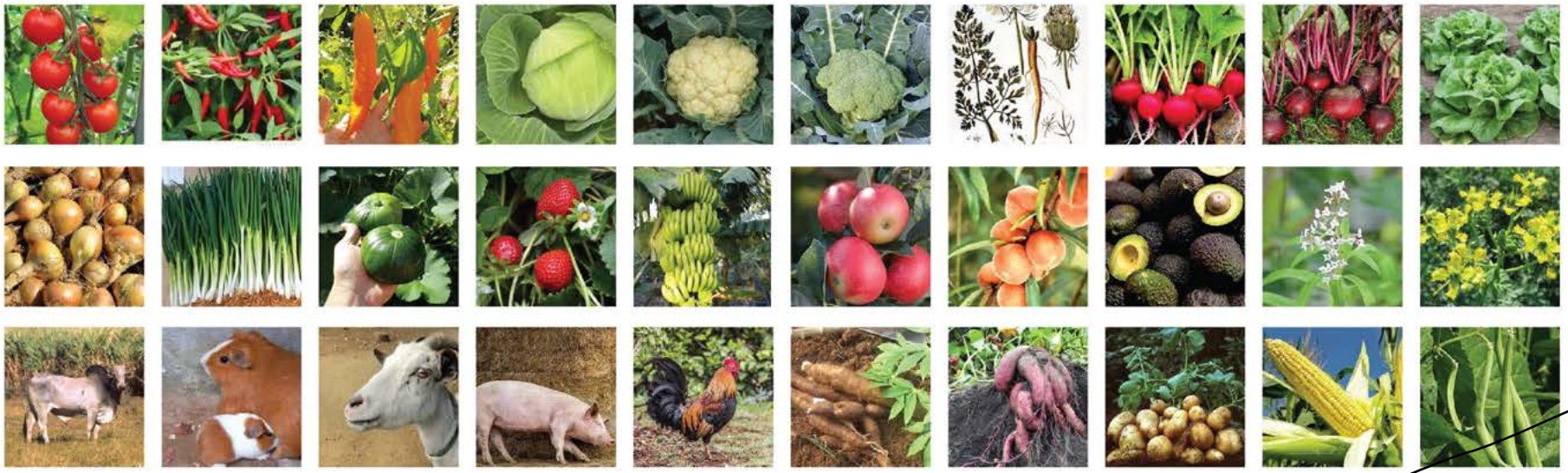
The peruvian geographer Pulgar Vidal divided the country in his tesis "The 8 Regions of Peru" taking in account the Altitudinal Floors, the Flora and Fauna. With this we passed from an horizontal way of understanding the peruvian geography (Coast, Mountain and Junlgle) to a vertical one. In addition to that, Pulgar Vidal stated that to analyze the territory is necessary to consider all the natural elements combined with the historical process and adaptation the human being had realized in the territory (Pulgar Vidal 1987:12)

In the Lurin River Basin we can find 5 of the Natural Regions stated: Chala (0-500 m.a.s.l.), Yunga (500-2300 m.a.s.l.), Quechua (2300-3500 m.a.s.l.), Suni (3500-4000 m.a.s.l.) and Puna (4000-4800 m.a.s.l.).



Biodiversity

The vertical division of the basin makes easier to understand the the diversity of vegetations and animals as well as ecosystems that co-exist along the river line. Acording to Pulgar Vidal, the prehispanic man and some of the current farmers had a clear image of their landscape and how to take advantage of their resources and generate a network for exchange.

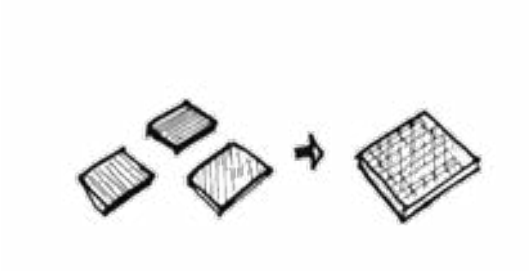


03.1.3 The Andean Landscape Characteristics

The architect Jean Pierre Crousse in his book "The Peruvian Landscape" states the andean vision of the world is immanent in which everything is a living organism and there is no separation between human being and nature; the human being is a life form of nature as it is the soil, the mountains, the stars, the gods and even the artifacts and human actions (Crousse 2019:30). In this context he explains that there are some singularitues that define the prehispanic landscape:

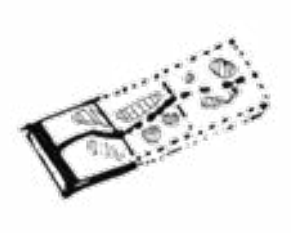
1. Systemic Order:

The pre-hispanic inhabitants organized their territory by establishing relationships of duality and parity between the three comunities that conformed their world, Nature, Gods and Humans. These three communities inhabited the Pacha which means, in modern terms, landscape. This relationship privileged diversity, in which human actions where included, through the mutual upbringing of these communities. The relationship was called Chachra which means "to upbring"and it was the essential key for co-existence and the transformation of the territory and the cultural development. In other words, Chacra, means in our context, Cultural Landscape (Crousse 2019:49).



2. Metavisibility:

The understanding of the landscape was not limited by what the eye could see but to the knowledge of the Natural Regions and the Ecological Network. With this, an strategic use of resources was developed based on the productive comeplementarity. In other words, the civilizations understood that their Chacra was part of a bigger one.



3. Continuity:

In contrast with how we understand time nowadys, for the andean civilizations time was a cycle. Not a linear process but a constant living where the nature, gods and human actions transformed the reality. This way to see time made possible to understand natural cycles and combined with productive ones as seen in the agricultural processes.

4. Aesthetic Will:

The aesthetic value was centered in the relationship between the three communities and their mutual development, not in the look. In this way, mantaining an equilibrium was the main purpose. The agriculture helped to transform the nature generating a productive landscape. The function had an aesthetic value and this function was inmerse in a sacred land therefore the mutual upbringing must have an equilbrium for the benefit of all.

5. Predication:

The understanding of the relationship between human being and the landscape is not understood as subject and object but more as subject and predicate. The landscape had a purpose and an identity resulting from the human actions.

The architect Willey Ludueña writes that the way of living and transforming the landscape in the prehispanic world must be explained in a mythopoetical vision of the reality (Ludueña 2008: 60). And he explains that the relationships between the human bein and the nature was not a relationship of violence but of concordance and mimicry.

"The cosmovision these civilizations had of the world transformed the elements of landscape like the trees, the mountains, the rivers into mythical entities loaded with sacred meaning. The aesthetic of the landscape was about the concordance or the ontological mimicry with the landscape" (2008: 60).

The domestication and cult of the soil and water became main mythical and aesthetic components in the imaginary of these civilizations. The landscape was composed by the natural elements and the human actions that happened on it. The aesthetic and the utility functions were combined and form a unique understanding of the territory (Ludueña 2008: 60).

He also states that

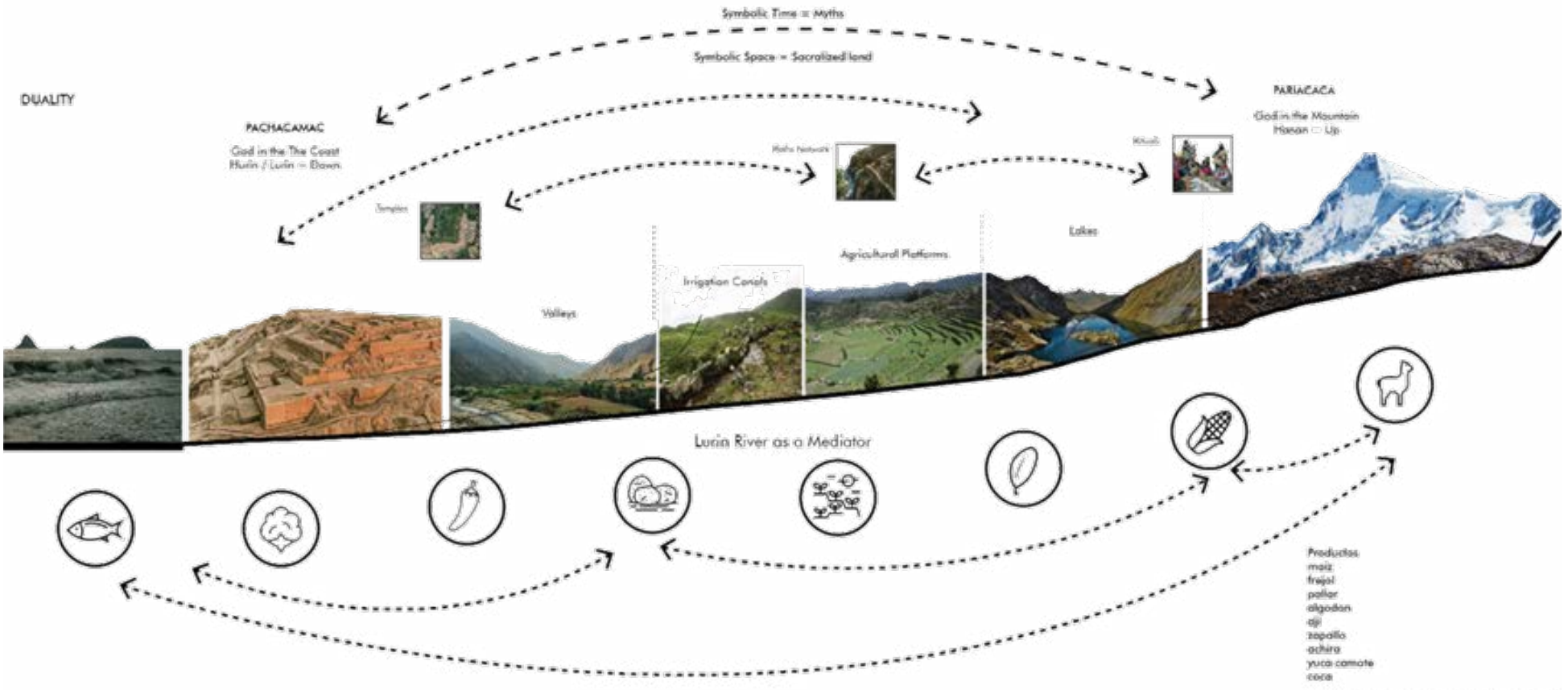
"The cult to the water was essencial in the andean cosmovision. The water is source of life and fertility. In hte collective imaginary the water flows through the underground from the ocean to the snowpeaks. To then distribute through the rainbow and return again to the source matrix transformed into lagoons and rivers" (2008: 64).

Verticality

In the Lurin River Basin we can find the characteristics Crousse describes and also the values Ludueña mentions.

The Systemic order was established by the duality generated between the two main deities, Pariacaca and Pachacamac. One in the upper zone called hanan and the other in the lower part, hurin, which is where Lurin takes its name. These duality organization can be seen in the juxtaposition of symbolic time and space represented in the territory as myths and a sacralized lands.

The combinations of these elements explained the origin of lakes, valleys, temples, irrigation canals and also gave sense to the roads, rituals, the agriculture activity and the exchange of products between communities along the basin. The river, as a sacred element, played the role of mediator between all these interactions.

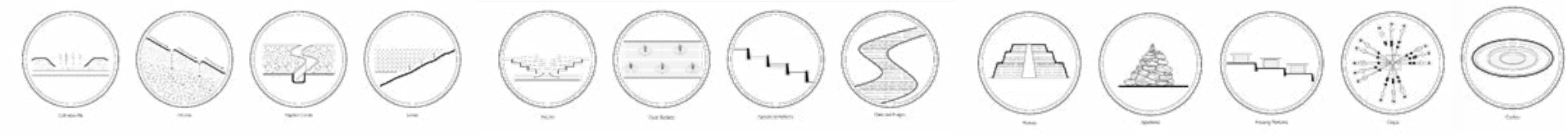


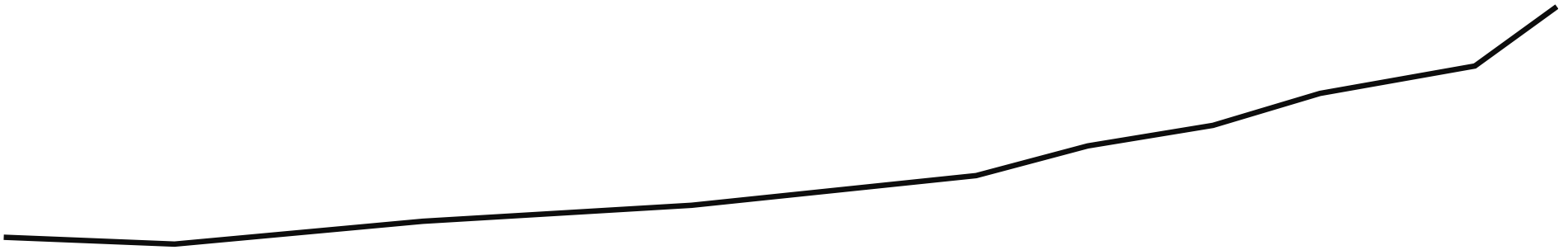
Prehispanic Landscape Transformation tools

The "mutual upbringing" of the three communities that conformed the andean world, nature, gods and humans, is the key for the tools that are used in order to recreate the nature.

"This elements, identified by all the peruvian researches studied, constitute elements for the recreation of nature, but they acquire a holistic sense only as they continue to be raised by the communities that use them" (Crousse 2019:63)

The agriculture as a main activity in the landscape transformation had to adapt to the lack of ideal agricultural land. That in addition to the different Natural Regions made possible different strategies and tools in order to made possible the habitability in the territory. Some of them can be identified along the Lurin River Basin.



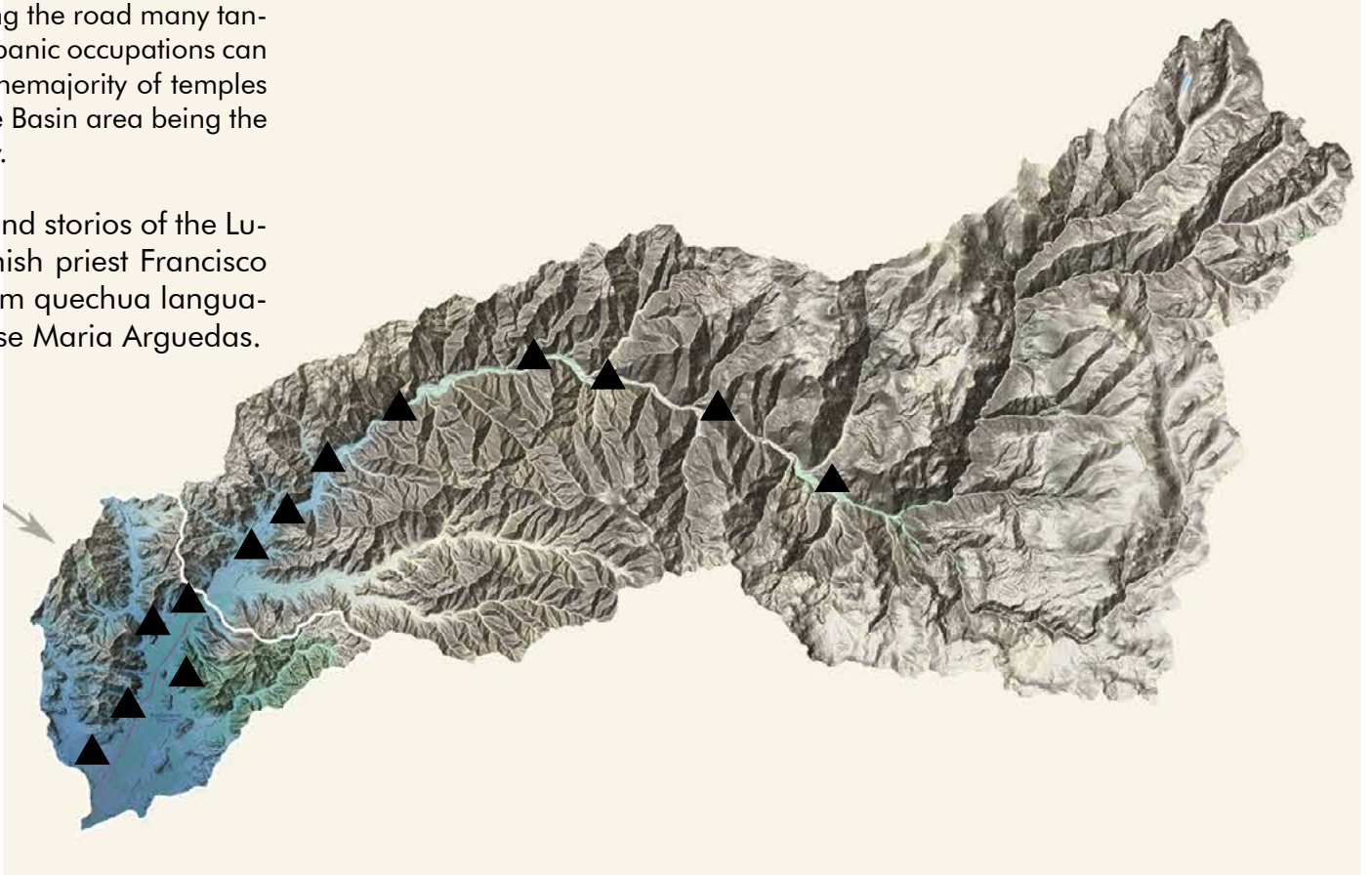


Qhapaq Ñam and the Archeological Sites

The Lurin River Basin had an important meaning for the prehispanic inhabitants. In the Lower Basin was located the Pachacamac Ceremonial Urban Center for the deity of the same name and in the upper basin the Pariacaca mountain, place of rest fot the deity of the same name. They organized the basin in a sense of duality that was expresed in myths and physical interventions in the territory.

The connection was physically expresed in the form of a road along the basin called Qhapaq Ñam. Along the road many tangible and intangible evidence of the prehispanic occupations can be found. It is important to mention that themajority of temples and public structures are found in the Lowe Basin area being the most important the Pachacamac Sanctuary.

()...fortunately some interesting myths and storios of the Lurin River Basin were saved by the spanish priest Francisco de Avila in 1538 and the translated from quechua language to spanish by the peruvian writer Jose Maria Arguedas.



03.2 The Lurin Valley

03.2.1 The Lurin River and the Natural Elements

Geology

The geology of the Lower Basin, is characterized by the presence of groups, formations and members, which constitute a package sedimentary and volcanic that was intruded by the batholith of the coast. [ANA,2019]. In general, three lithological units are identified that emerge and are classified according to their origin and composition in:

a. Superficial deposits

Alluvial deposits: made up of accumulations of materials carried by surface runoff, deposited far from their place of origin. Along with instrusive rocks, this deposit constitute the majority of surface in the basin. Consists mostly in in conglomerate and gravels. They're characterized by the predominance of urban an agricultural use. Wind Deposits: deposits generated by the action of the wind that redistribute sands fines and silts. Fine sands are used as construction material and where numerous settlements have been installed by humans.

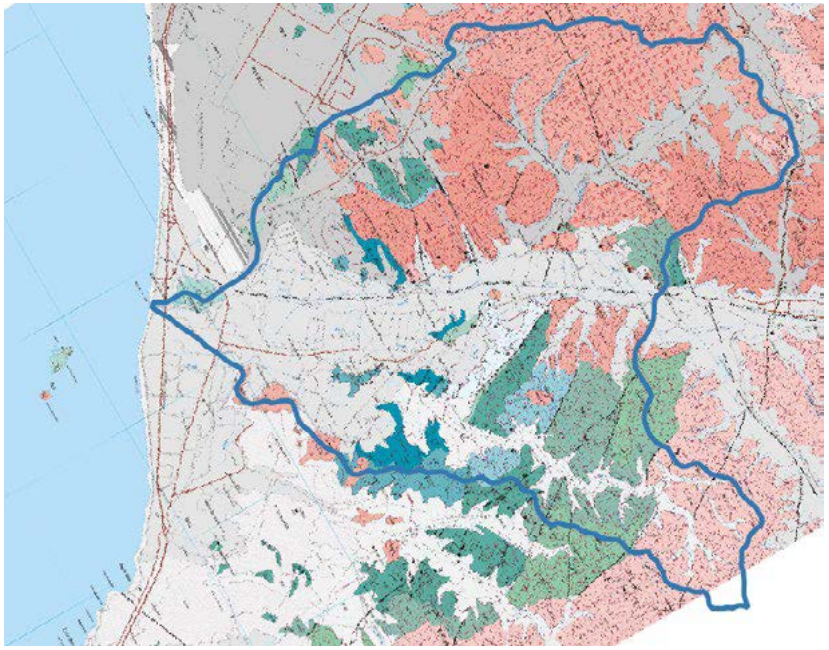
b. Intrusive rocks

Occupy a large proportion of the basin and consists mostly in the superunit Santa Rosa, the Tiabaya superunit (tonalita, greenstone); and to a lesser extent by the superunity Atocongo (monzogranite) and the Patap superunit (gabrodiorite).

c. Sedimentary rocks

Consists mostly in sedimentary rocks from lower cretaceous. It is com43posed of thin layers of dark gray siltstones that form bundles and are interspersed with light to dark gray limestones, marls, altering reddish limolitas, and also with the presence of ferruginous materials that oxidize.

This rocks are exploited as a material for construction in the form of limestone, clay and raw material for cement production.



Geomorphology

The study area contains various types of landforms scaterred along the territory. They can be classified in: a) mountains b) hills or knolls c) mantles d) dunes e) floodplains f) foothills g) anthropic h) riverbed i) marine terrace. The most important in terms of area covered are mountains, hills or knolls, foothills and floodplains.

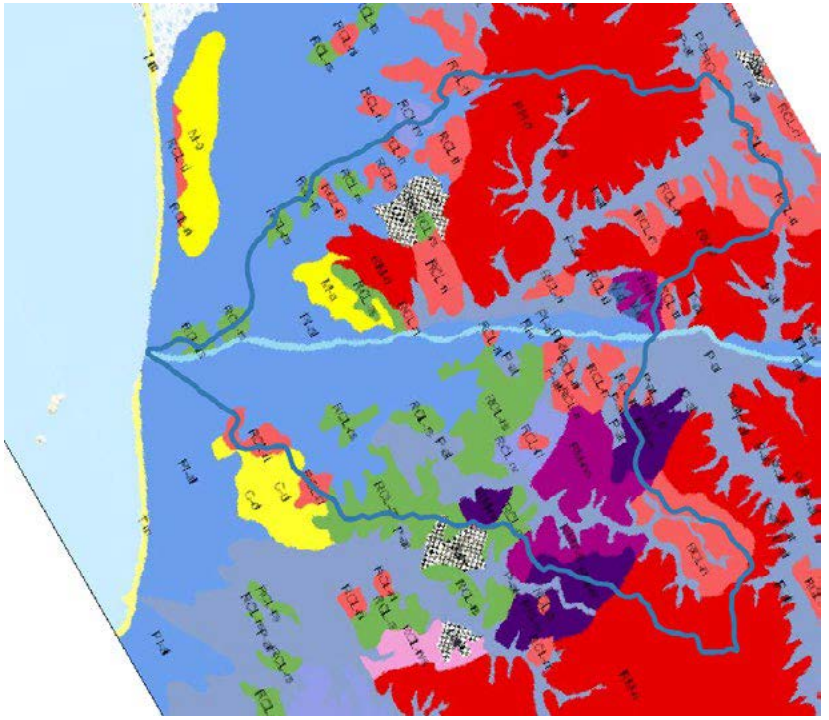
Floodplains were created by the action of the river and provide the surface in which most of the human activity takes place. Agriculture and settlements are the most common activities in this landform. Because of the longitudinal distribution of this landform across the territory, floodplains are the most effective way of connecting the territory. After floodplains, foothills host many of the human activity but lack agricultural development due to the scarcity of water.

The mountains and hills are mostly made up of the outcrow of intrusive, sedimentary and volcanic rocks and is the most predominant landform type in the area. In general, they are inhabited but carry activities related to mining and eco-tourism. Sand mantles, dune fields and the marine terrace occur in proximity to the coast and together with the hills and mountains have the most important scenice potential.

Hydrogeology

Climate

Soils



03.2.3 Historical Analysis

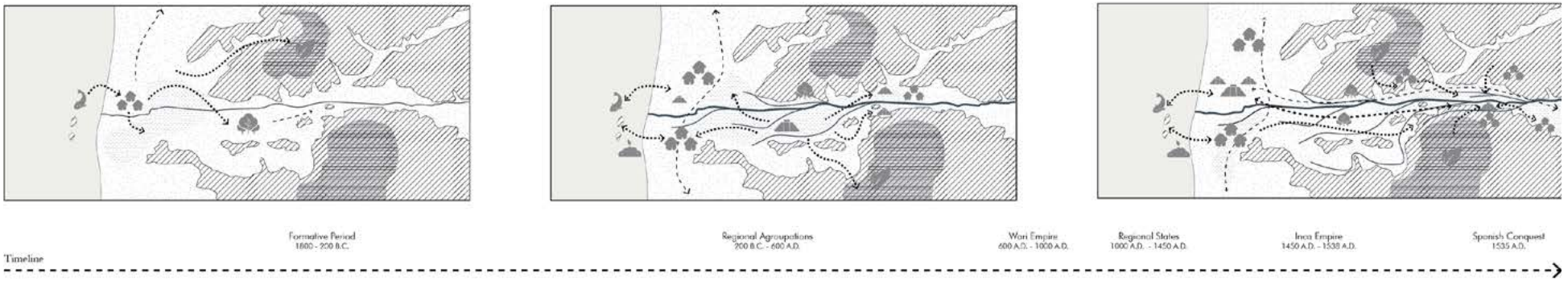
The architect and urbanist José Canziani explains that in the conception of the andean world the territory is assumed as a extension of the human body, a second skin. According to this, he explains we can assumed that the implementation of urban centers was as a part of an integral development of the territory and not as a disruption between the city and the territory (Canziani XXXX: 32).

In this way, the city, the road network, the irrigation canals for agriculture fields and other human built elements conformed a cultural landscape. The role of the urban centers as well as the monumental architecture was focus on enhancing the rural territory making possible the sustainble development of human settlements.

"A kind cultural landscape as a result of the contruction of a fertile habitat in the coast valleys not only made possible the economic excedents that supported civilization processes but also generated a cultural identity." (Canziani XXXX: 32)

<u>The Role of the Irrigation Canals</u>

In order to transform a desert plane in a fertile land the inhabitants generated a network of irrigation canals in a progressive way directly connected to the valley occupation. By achieving this they passed from collectors that extract resources from the sea and lomas to settlements with public architecture and an increasing agriculture activity fo finalize in ceremonial urban centers with extense agriculture (Canziani 2009: 47-50).



Diachronic Maps - Prehispanic Occupation

The Current Occupation

Since the Spanish arrival in 1535 the valley had followed different parameters in its occupation. With the excuse of the evangelization, the Spaniards tried to erradicate the existent cults and customs at the time. The loss of the landscape memory starts from there.

In the Lurin Valley we can find some of that evidence in the book "La Revisita de Sisicaya, 1588" (The Revisit of Sisicaya, 1588). Here are collected interviews to the local population at that time grouped in small settlements with some of the remaining prehispanic social structures (Feltham 2009:57). Nevertheless the author explains that:

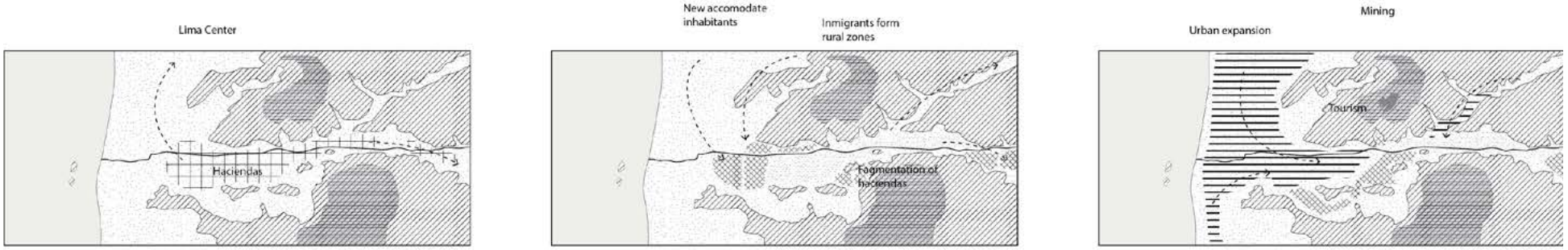
"It is interesting to see that, 55 years after the arrival of the Spaniards, the residents of the valley had erased the Incas from their memory, since they did not mention them either in the revisit or in the appraise." (2009:101)

The author also mentions that churches were built where prehispanic ceremonial centers had important congregation and the reduction of the native population.

The author also mentions that churches were built where prehispanic ceremonial centers had important congregation along with the uses of other ritual structures. Another important event is the reduction of the native population.

The Lurin Valley was transformed into ranch for noble spaniards mixed with the native farmers that were the workers of those ranchs. The same figure and stayed even after the Republic times until the "Agarian Reform" in 1969. With this, the owners of the agricultural lands passed to the people who worked on it. Many of the owners at that time decided to sell their land or even the new owners, the farmers, decided to divided the ranch and sell it. With this, a new user entered to the valley. People of medium and medium high social class who bought the lands for country houses or small agricultural activity (Mamani 2018:47).

Nowadays the valley represents a dispute between the remaining agricultural activities and the residential and industrial urbanization.



Diachronic Maps - From Spanish Colony to Current Occupation

The Lurin Valley, like the rest of the peruvian landscape, is the result of the superposition of two cosmovisions. From one side the prehispanic present somehow in the oral traditions and agricultural techniques and the occidental brought by the spaniards and the modern context present in the way nowadays the population interacts between the nature and the human actions (Crousse 2019:54).

In addition to that the architect Willey Ludueña explains that Peru does not have with a written story refering to Landscape and this absence becomes more evident in the constant omissions related to the Inca or Aztec landscape (Ludueña 2008: 59).

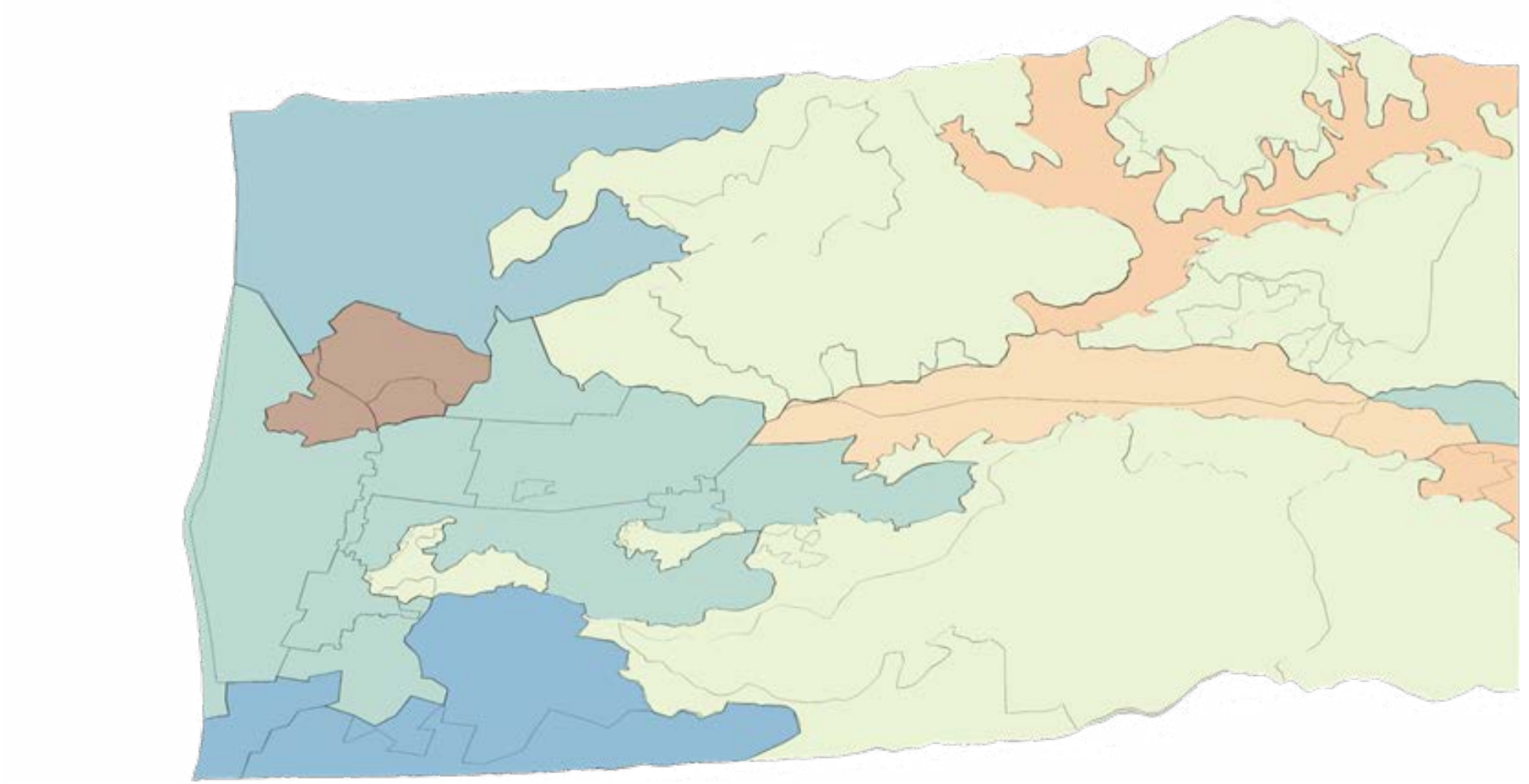
Therefore the problematic we faced is the absence of the landscape memory inherited from prehispanic civilizations and a unsustainable understanding of a modern city.

"It seems that the colonial syndrome of the city of Spaniards as opposed to the indigenous territory was projected to a modern city ... and that in doing so it devastates all signs of appreciation of the rural territory and the memory of the indigenous past and even the most recent one." (Canziani xxx:34)

Synchronic Map - Superposition of two cosmovisions

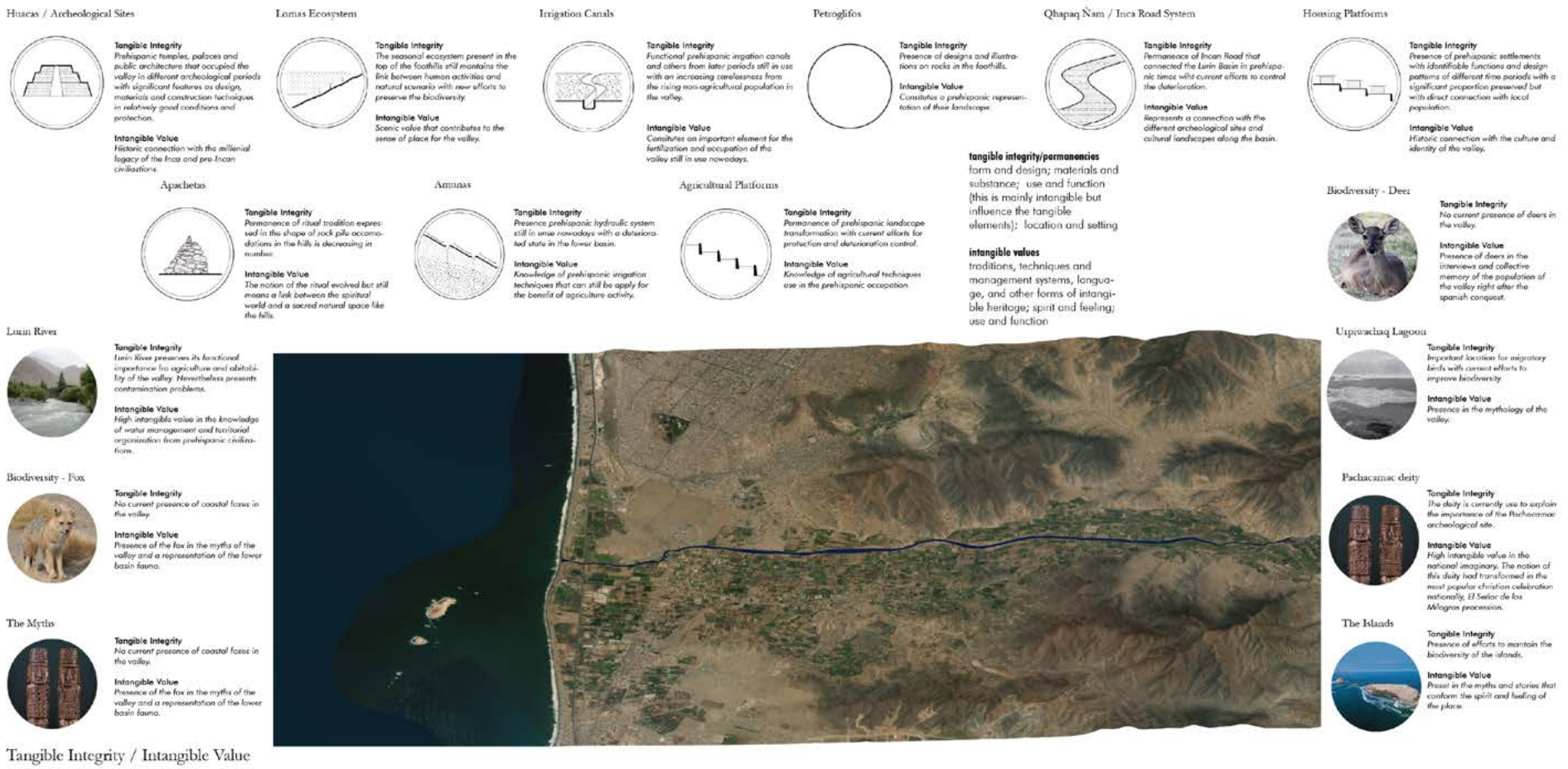
Landuse

03.3 The Landscape Character Assesment



04. Recognizing the Value

04.1 The Tangible Integrity and the Intangible Value



04.2 Spatial Character and Attitude to Change

Urban Desert

Spatial Character
Urbanized areas related with housing and industry in constant growth. Limited public areas.

Attitude
Housing, working, high dense transportation.

Archeological Desert

Spatial Character
Desert plane with important archeological heritage sharing space already consolidated urban invasion that started in 1970's.

Attitude
Tourism, pedagogical activities, housing, reflexion, raise awareness activities.

Urbanized Agricultural Land

Spatial Character
Urbanizations in the valley that with low density surrounded by the agricultural field and direct or indirect contact with the Lurín River.

Attitude
Housing, recreational restaurants, festivity places, community meeting centers, agro-tourism, countryside activities.

Coastal Urbanized Agricultural Land

Spatial Character
Industrial plots and urbanizations in the coastal part of the valley with still low density surrounded by industrial plots. Limited public areas.

Attitude
Eco-tourism, bicycle rides, contemplation space, beach related activities.

Agricultural Land

Spatial Character
Extense historical agricultural lands worked since prehispanic times with heritage elements still in use like irrigation canals.

Attitude
Agro-tourism, walking, bicycle rides, contemplation space, pedagogical space, raise awareness activities.

Agricultural Land - Transition Zone

Spatial Character
Agricultural lands with high class countryhouses. Land use passes from a productive activity to a residential one.

Attitude
Housing, commerce, integration, raise awareness.

Hills and Lomas

Spatial Character
Seasonal ecosystem with native flora and presence of archeological elements as well as agricultural communities at the bottom.

Attitude
Eco-tourism, hiking, bicycle rides, contemplation space.

Foothills - Rural Communities

Spatial Character
Rural communities dedicated to the agriculture located between the lomas and the agricultural land.

Attitude
Eco-tourism, agro-tourism, reflexion, raise awareness activities, agriculture support activities, horticulture, pedagogical spaces.

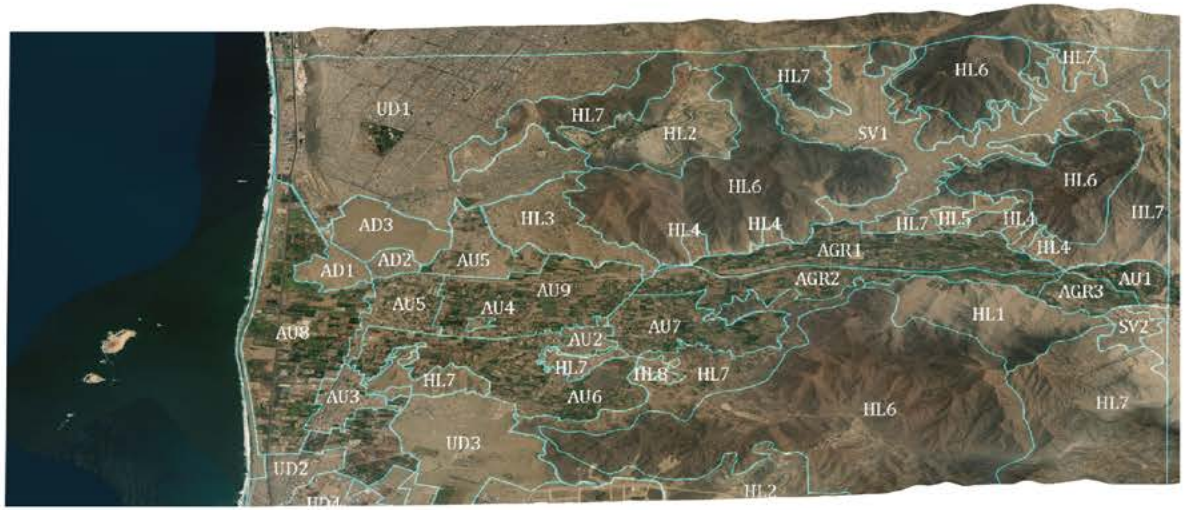
Stream Valley

Spatial Character
Urbanized zones between the foothills with limited green and public spaces.

Attitude
Housing, commerce, connection, working spaces.

Activities

Housing
working
high dense transportation
Tourism
pedagogical activities
reflexion
raise awareness activities
recreational restaurants
festivity places
community integration places
agro-tourism
countryside activities
Eco-tuorsim
Walking
bicycle rides
contemplation space
beach related activities
commerce
agriculture support activities
horticulture



Spatial Character / Attitude to Change

04.3 Stakholders and Protection

Burocratic Actors

Regional Government (Municipality of Lima)
National Water Authority (ANA)
Ministry of Culture
Ministry of Energy and Mining
Ministry of Economy and Tourism
Ministry of Construction and Sanitation
Water users associations (Juntas de Agua)
Ministry of Agriculture

Political Actors

Local Governments
Non-agricultural users

Special Actors

Agricultural users
Rural communities
Chamber of Tourism
Entrepeneurs
Land Owners
Tourists
Population of the Valley

Expert Actors

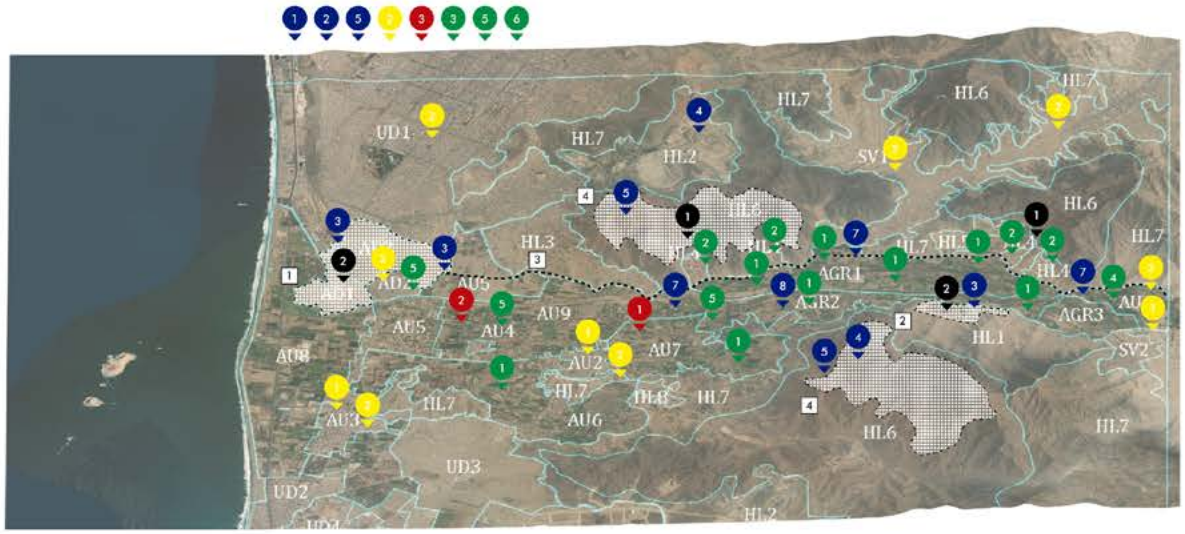
Schools
Universities
Professional associations

General Actors

NGO's
UNESCO

Protection Plans

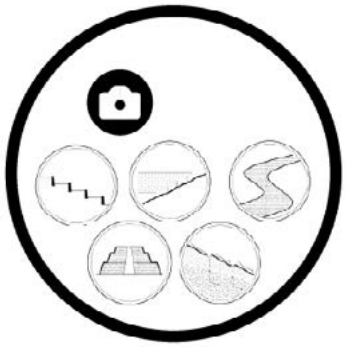
1 Pachacamac Cultural Landscape Project
2 Pampa Flores Unesco inscription
3 Qhapaq Ñan Project
4 Lomas Protection Legal Frame
5 Archeological Sites Protection Legal Frame



Stakeholders / Protection

04.4 Design Principles

Diversity



There must be a balanced system that integrates nature, human actions and the collective imaginary in order to transform the landscape in a sustainable way.

Continuity

The landscape must be preserved allowing it to be productive and to allow human interactions with the nature and its resources enhance the biodiversity.

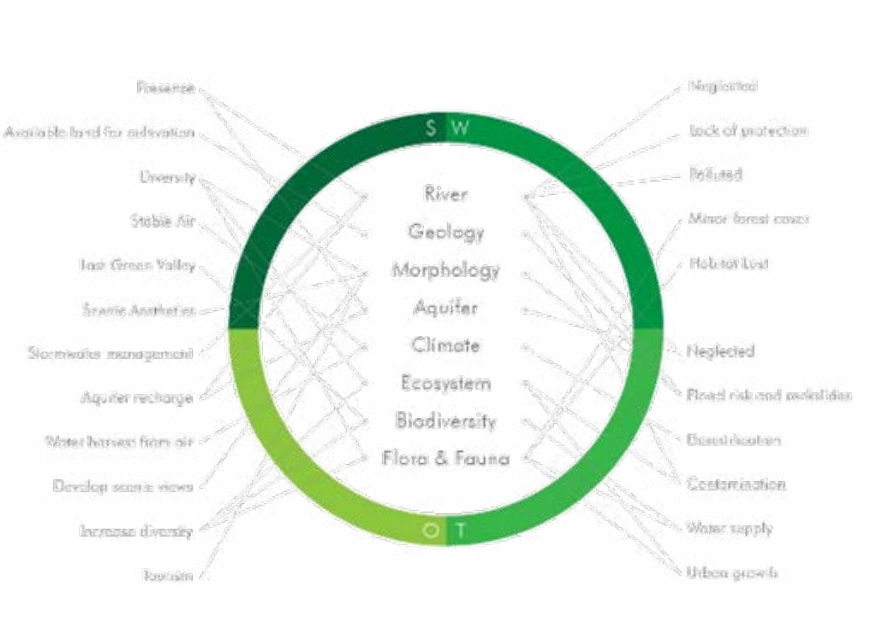
Connectivity

An intervention in the territory can be an opportunity to connect the landscape not only in the sense of space but also in time. Allowing people to connect with their heritage and exchange human experiences.

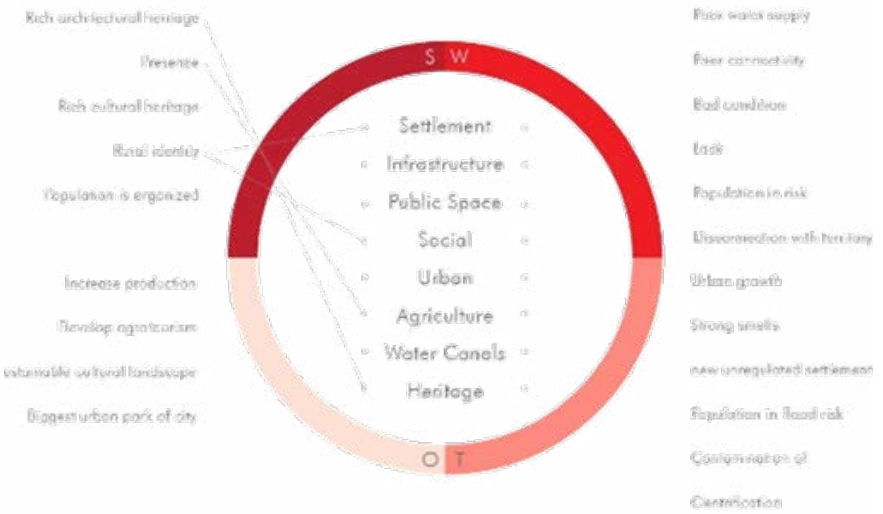
06. Proposition

06.1 SWOT Analysis

Natural Elements



Anthropic Elements

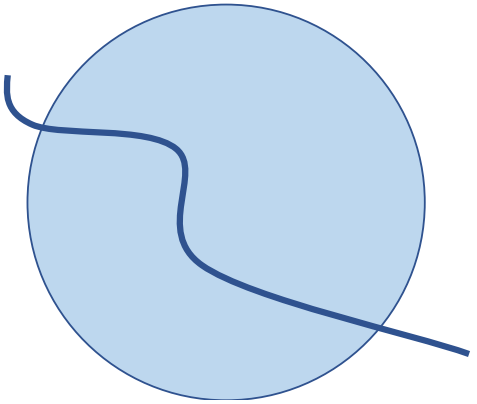


Swot Matrix


OPPORTUNITIES + STRENGHTS = ATTACKING STRATEGY
BUILD STRENGHTS FOR ATTACKING STRATEGY
BUILD STRENGHTS FOR DEFENSIVE STRATEGY
STRENGHTS - THREATS = DEFENSIVE STRATEGY

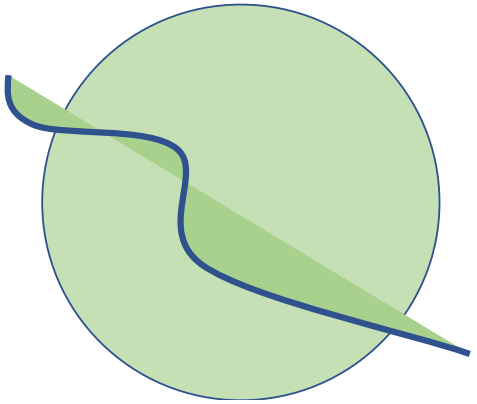
06.2 Design Strategies

Diversity



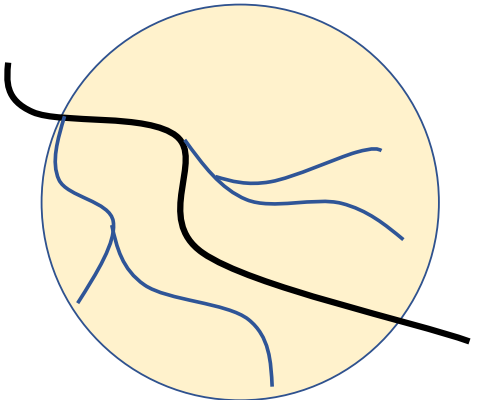
Provide Ecological Infrastructure

Continuity



Secure the Agricultural Scenario

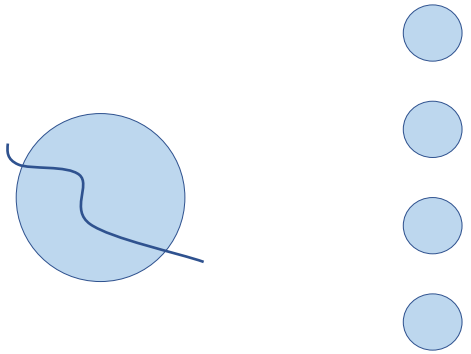
Connectivity



Requalify the Irrigation Canals Network

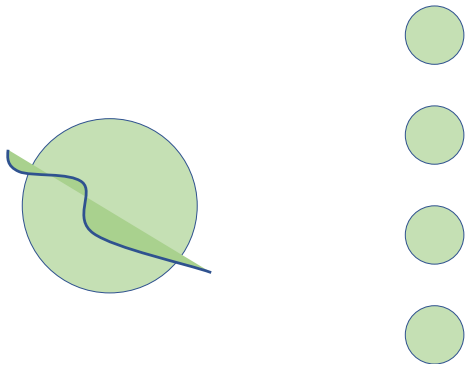
06.2.1 Provide an Ecological Infrastructure

Functions



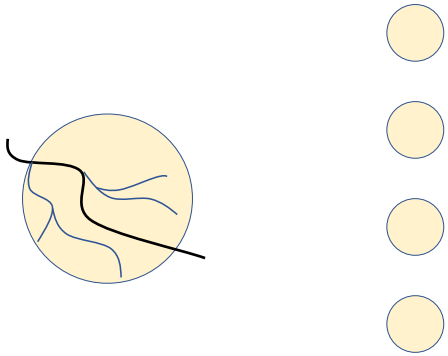
06.2.2 Provide an Ecological Infrastructure

Functions



06.2.3 Requalify the Irrigation Canals

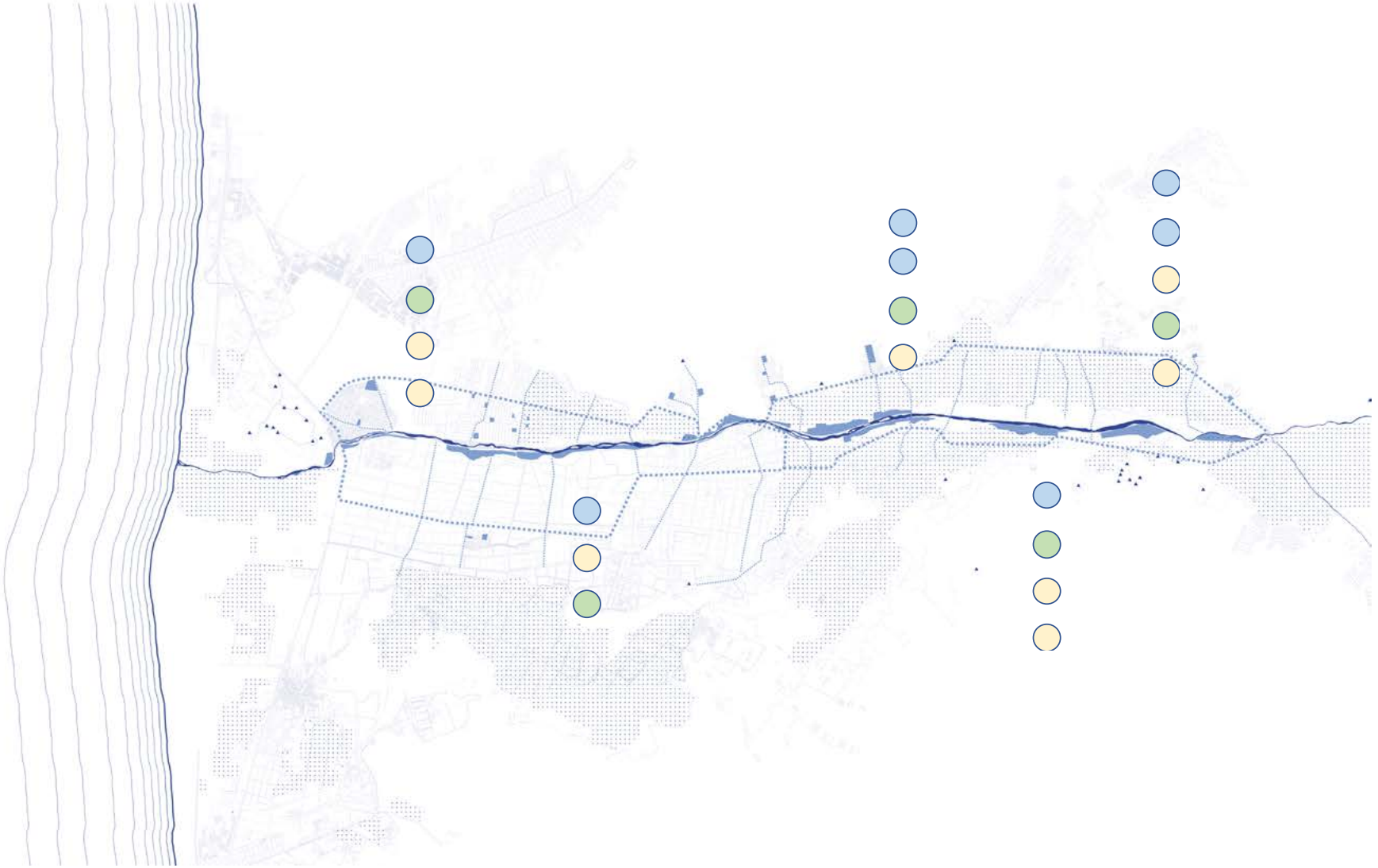
Functions



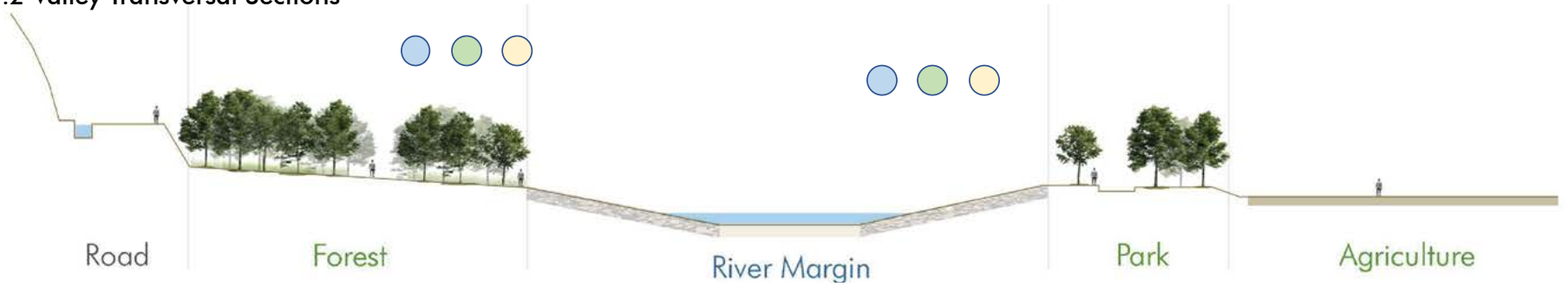
07. Design

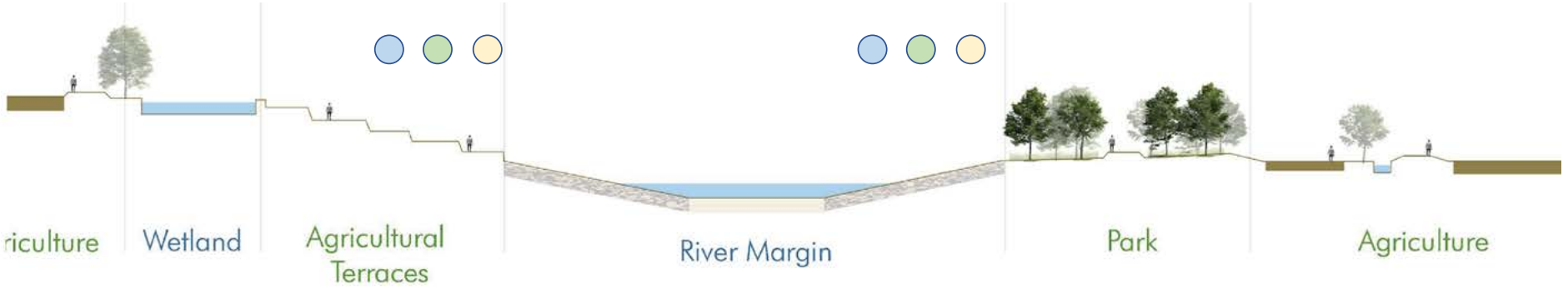
07.1 Macro-Scale

07.1.1 Masterplan

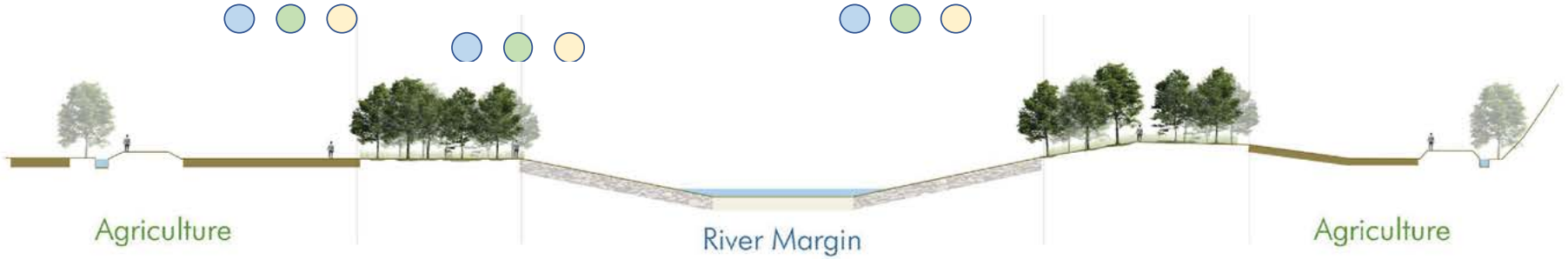


07.1.2 Valley Transversal Sections





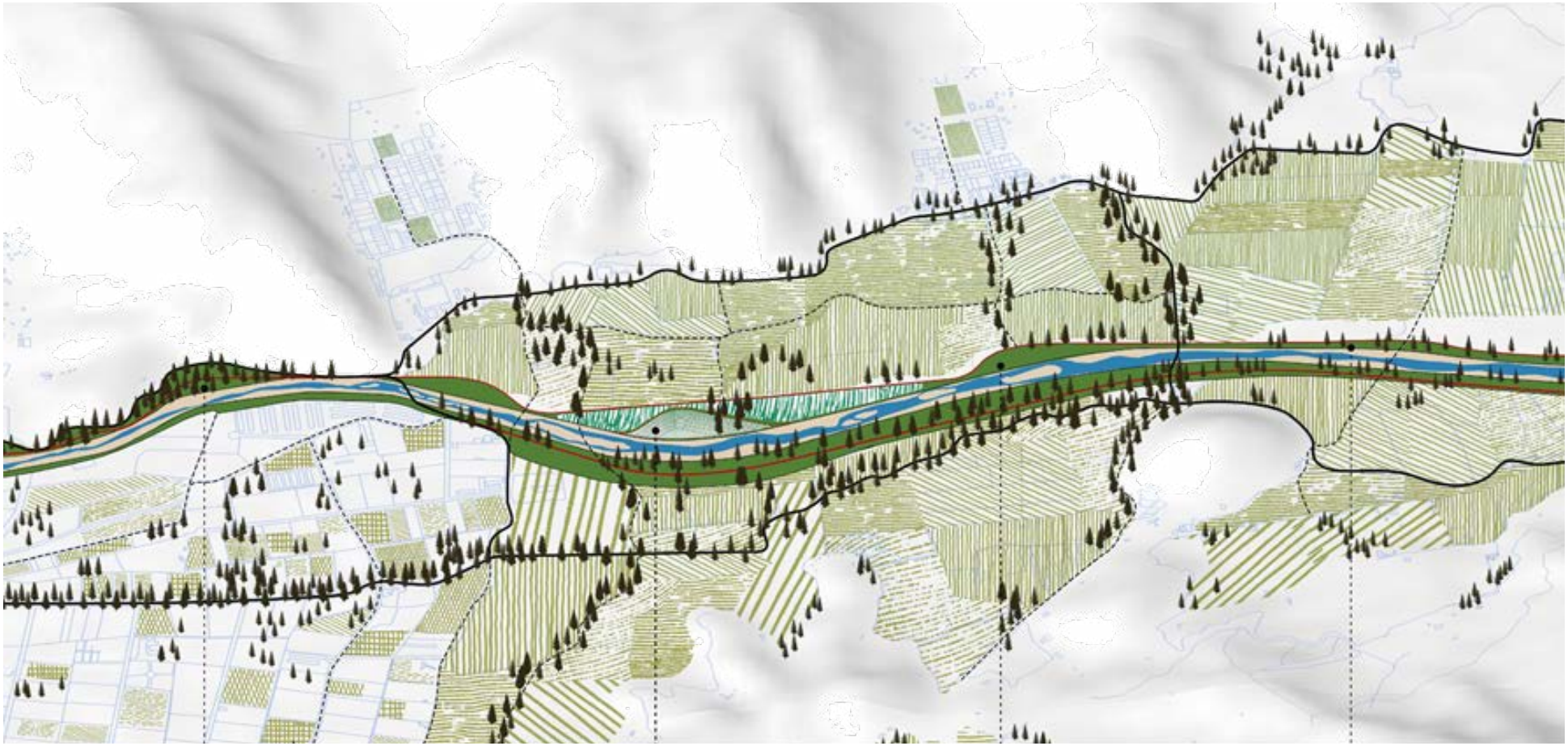
Section B - B



Section C- C

07.2 Medium-Scale

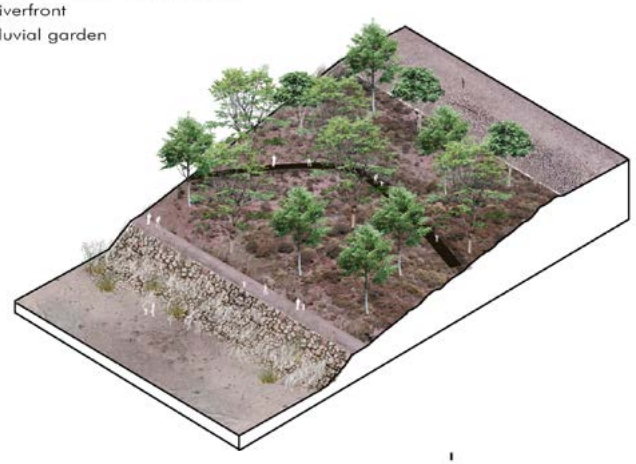
07.2.1 Visualizing the Strategies



07.2.2 Design Tools On-Site

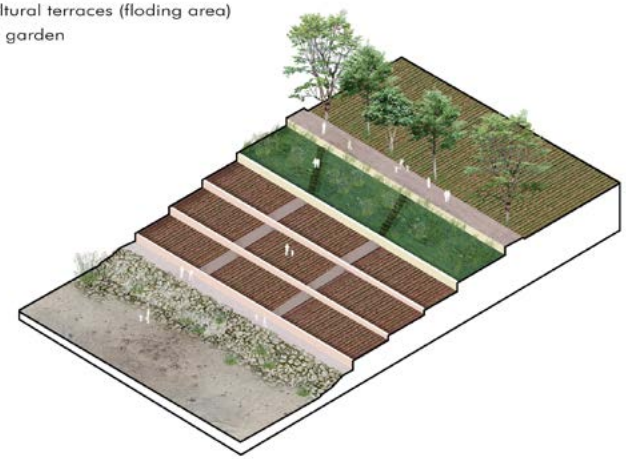
Forest

Erosion control - Reforestation
Riverfront
Fluvial garden



Water treatment

Artifitial wetlands
Agricultural terraces (floding area)
Fluvial garden

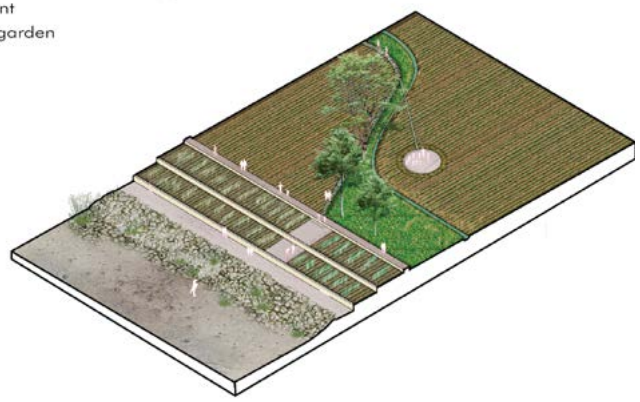


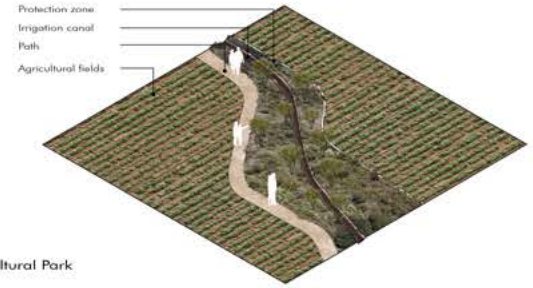
Water storage

Agricultural Park
Water resorvoir
Riverfront
Fluvial garden

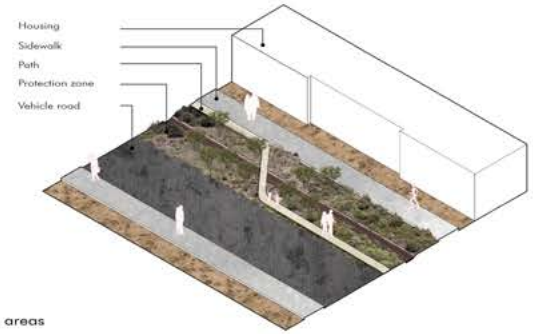
New conections

Restored irrigation canals
Agricultural Park (Education spaces)
Agricultural terraces (floding area)
Riverfront
Fluvial garden

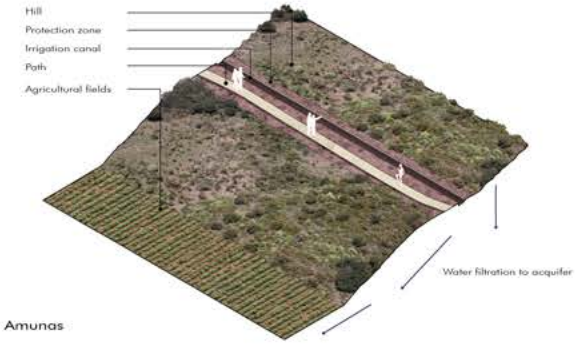




In Agricultural Park

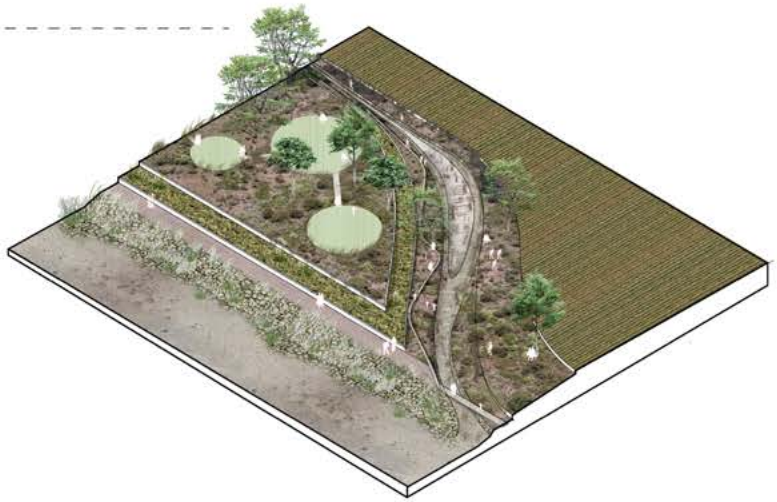


In Urban areas



In hills - Amunas

Types of Irrigation canals



Bocatoma Park

Water intake for irrigation canals

07.2.3 Sections

Agricultural Park Section

Forest Section

Urban part Section

07.4 Vision