WEAVING THE LANDSCAPE

A SYSTEMIC DESIGN APPROACH TOWARDS RECLAMATION OF ARBATAX FORMER PAPER MILL

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A SYSTEMIC DESIGN APPROACH TOWARDS INTEGRATIVE RECLAMATION OF ARBATAX FORMER PAPER MILL

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Abstract

The thesis investigates an abandoned industrial landscape located in the central-eastern part of Sardinia. The 35 ha of the Paper Mill land has been abandoned for almost 22 years which has affected the local economy adversely and has created a void between the city and nature. In a Systemic Design approach, the project seeks to interact with environmental, economical, and programmatic stresses across regional territories. Understanding how natural and artificial systems dynamically function in regional territories and small locals, and ultimately feedback into both scales from new design and planning intervention. With this logic as the theoretical framework of the thesis, the design tries to regenerate the land as a productive agent for the economy of the territory and to reconnect people to nature by binding together different flows of energy and assets of the landscape and introducing a language for a new system that helps to conduct an integrative reclamation of the economy, ecology and cultural heritage of the site.

A primary goal of the design is an ecological renewal of the industrial site to promote new economic development and to envision the social and cultural unity of the area as a fishery village and agriculture-oriented local economy. The Re-Thinking process reads the landscape across different scales and reacts with multi-layered time-based strategies and will create a substantial, complex, and proactive project scenario that works to reclaim value and increase sustainability in a new productive, Livable, and ecologically democratic peri-urban environment.

This way of designing creates a synergy that the action of its sub-components creates a result much stronger than their individual efforts, turning the site into a canvas composed of multiple elements that reflects the territory within itself.

Acknowledgment

This thesis wouldn't exist without the support of many outstanding individuals worldwide. I especially want to thank my family, for providing me with everything to pursue my passion and always being there for me.

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I'm glad that I can say, every minute of working on this project has been accompanied by joy, passion, excitement, Learning, and hope, in order to achieve my maximum capacity through both pleasant and uncertain times.

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01
Synopsis

INTRODUCTION

The project area is a complex landscape with traces of former regimes, from the Italian economic boom to European deindustrialization. The state of fact is a Terrain vague lost in the Border of conservation and change.

"Cities are not static objects, but active arenas marked by continuous energy flows and transformations of which landscapes and buildings and other hard parts are not permanent structures but transitional manifestations" (Berger, 2006b, p. 203). The general framework of the research is an ecological methodology of sustainable thinking about the design and management of reclaimed, post-industrial landscapes. As a result, a landscape that was not previously considered fit for habitation is now being rehabilitated and redeveloped for new uses. "contemporary modes of industrial production driven by economical and consumerist influences contribute to urbanization and the formation of waste landscapes – meaning actual waste (such as municipal solid waste, sewage, scrap metal, etc.), wasted places (such as abandoned and/or contaminated sites) or wasteful places (such as oversized parking lots or duplicate big-box retail venues)". Berger (2006, p. 203). Wastescapes are an inevitable result of the processes of economic growth that produce waste and emissions that damage land, water, fields, but also buildings, and infrastructures. Therefore, the flows of matter and energy and those of waste that feed or come from the activities of the supply chain, respectively, are also able to shape the territory in its physicality. (Berger, 2007) This generates the development of portions of territory that are no longer able to provide goods and services and, finding themselves at the end of their life cycle, they are like "waiting for spaces" or terrain vague The activation of new urban regeneration processes may be able to give new functions to these portions of territory and to reconnect them to the surrounding urban fabric. This means that the real challenge is to integrate these portions of land into the functioning of urban ecosystems (Berger, 2007). turning useless matter into the useful matter, as it happens in the waste recycling system (Erz,1992; Strasser, 1992), avoiding further land consumption. The disuse can be understood as a "natural" phase of the life cycle of the functions and spaces predisposed to welcome them (Baiocco et al., 2017). This vision determines the consideration of urban ecosystems as endowed with a metabolism capable of digesting, assimilating, and feeding the succession of cycles of production and where space is always small with respect to the number of flows (economic and human) that cross it. According to ISTAT, about 3% of the entire Italian territory is occupied by abandoned industrial areas Arbatax Paper Mill is one of the most renowned ones with a former area of 135 ha of which 35 ha remains today. The municipality of Tortoli

has tried many times to reclaim the former paper mill area but never succeeded due to its strategic location for urban development, the complexity of the site, and the vast, abandoned landscape with multiple demands considering the Arbatax port, Tortoli lagoon and the city of Tortoli and Arbatax hamlet. As a consequence, the re-development of these areas constitutes a current problem of considerable interest, characterized by economic, social, and environmental repercussions and it represents as well an unavoidable opportunity for activating urban regeneration actions and for the valorization and re-connection of peri-urban areas. For this reason, new operational methods and techniques are required, in compliance with environmental compatibility. (Arbizzani and Materazzi, 2012).

The protection of industrial buildings is an important cultural objective and is inherently sustainable in that it encourages the positive re-use of redundant buildings that are part of our industrial and commercial heritage. Conservation can play a very important role in regeneration in raising the quality of the local environment, preserving local distinctiveness, and attracting visitors and new business, and it is very popular with local communities.

JUSTIFICATION

The disused industrial areas are also generally already served by the main infrastructures and are often located near railway plants or important sections of the road network that can determine good accessibility, therefore the return of these areas to the city can constitute an important occasion for the redesign of the local urban fabric (Aiello, 2012).

The recovery of abandoned industrial areas connected to the location of new important urban and productive functions can be configured as a unitary intervention of the metropolitan level, able to define places and relationships related to a large pool of users and able to renew and increase the points of reference in the vast territory (Miano, 2005). Likewise, the rise and fall of Arbatax's former Paper Mill have been connected to the territorial policy and decision making and its abandonment caused multiple issues for the urban realm and city dwellers as can be seen in the closure of the airport of Tortoli in 2005 immediately after the Paper Mill called bankruptcy. One of the aftershocks of this abandonment was the evacuation of a large number of residents due to unemployment and a declining local economy. almost one-third of the total homes in the area are not used by residents. (Relazione Preliminare di Scoping[15-52], Commune di Tortoli). Noteworthy is the fact that this number changes during the tourist seasons of the year as job opportunities arise as a result of the presence of tourists in the area which in essence underlines the importance

of tourists for the local economy and the opportunity for new touristic development.

Additionally, another important element in the area is the Tortoli lagoon (Stagno di Tortoli) which is a biodiversity interest area for immigrant birds and local fauna with a microbiome in danger because of excessive agricultural use and loss of vegetation and connection to bigger ecological hubs. This will lead to an ecological sink for the lagoon and loss of biodiversity if an appropriate ecological strategy won't take over. Due to its particular confirmation and the presence of numerous tributaries, the Tortolì pond is considered one of the fishiest basins in Sardinia, where it is still possible to find different and varied fish species, bred or released for the reproduction and survival of the species. the primary source of livelihood for the population since ancient times. The lagoon also defines the identity of Arbatax hamlet as a fishery village and has already influenced the local economy as traces of fish farming are found related to 70 years ago. But the downside to this is the lack of proper marketing and a sustainable approach to this industry. The relation between the city and the lagoon is not well defined today as the industrial area is located between the city and the area of the lagoon. The site of the Paper Mill is strategically located in a logistic and accessible place which makes it a potential area for a new connection between the city and the Immediate nature. one other reason that makes this potentiality even stronger is the native vegetation inside the site that has grown naturally during the 2 decades of abandonment.

Moreover, the immediate vicinity to the port of Arbatax has made this place of the highest value for the seafront development and a new gate to the city that has been discussed and put in the competition by the municipality but failed to proceed with a successful design proposal. The port is a gate to the Sardinia region also that welcomes commercial and tourist ships from the Italian mainland and other parts of the world.

In conclusion with the justifications discussed, an inclusive reclamation is foreseen for the area that promotes not only the site at the local scale but the territory from which it rises. Once the second-biggest paper mill in Europe is now calling for a new life that is sustainable, and proactive and aims at reclaiming its value while preserving its historical identity. Taking into consideration the complexity of the territory a resilience and adaptive design could only be done when they are in a connected network working together to regain value. This network can only be achieved through Systemic Design.

THEME

A holistic regenerative design strategy at the urban scale and a promotive ecological policy to re-connect discarded ecological hubs with a resilient approach.

The thesis investigates:

How can ecology take part in Wastescape Reclamations?

How would the design promote the economy in a regenerative approach?

To what extent does Systemic Design take the role in shaping new relations between different elements?

Addressing these questions and investigating the relationship between Systemic Design and was escape reclamation is the core subject of the research.

The industrial building reclamation design should integrate similar five fundamental principles: perform well the functions for which they are redesigned; be long lasting and adaptable to new uses; respond well to their surroundings and enhance their context; have a visual coherence and create 'delight' for users and passers-by; be sustainable – non-polluting, energy-efficient, easily accessible and have a minimal environmental impact (Punter, J. 2002)

AIM

The design goal is to re-think the relation between a wasted landscape and the context of the site through a Systemic Design approach. The proposed project will promote the local economy while enhancing the ecological network interrupted by human activities. It is an ecological renewal of an industrial area, which through a networked response system will reclaim the value of a former productive site.

Specifically, the design aims to link environmental improvement to economic developments and on a social scale, the project is a programmatic activator of public activities. These objectives would be achieved through strategies in three different scales:

First, at the territorial scale, the project aims at reconnecting the lagoon as a biodiversity interest area to the larger ecological hub. The connection is now interrupted by agricultural activity. This objective would be achieved through a system of green corridors identified on river basins and riparian woodlands that connect the lagoon near the industrial site to the larger green system.

Secondly, at the medium scale, a resilient green buffer around the lagoon connects the corridor to the site. This green buffer is a place where art and local agriculture plays a key role in social and economical activities while preserving the lagoon buffer from deforestation.

The third is the site of the Paper Mill at the urban scale and the relation of the site to the immediate surroundings such as the Sea, City, and the lagoon. At this scale, the design creates a dialogue between these three agents.

Through principles of Systemic Design, the landscape is transformed into something different, a place sensitive to different transformations, which records the movements and events that cross it.

OBJECTIVES

- To give value to the historical and cultural heritage of the site through reshaping a new relationship between their parts.

- To achieve a multi-layered time-based strategy for ecological renewal of the post-industrial site.

- To regain the value of the area as a productive landscape once was but in a contemporary approach.

SCOPE AND LIMITATIONS

The general scope of the research concerns the possible role that systemic design could have on ecological industrial reclamation in an altered landscape.

In the past, the industry was often abandoned without performing the appropriate reclamation work. Today, with the increased ability of perturbation that affects large portions of the landscape, there is a deep public concern that the industry should not be abandoned without performing any reclamation work. New design strategies to reclaim derelict industrial sites have been devised in recent years, focusing on the sustainability, quality, and multi-functionality of the space, with attention to historic, socioeconomic and cultural aspects (L. Loures & T. Panagopoulos, 2007)

Bagaeen in the book (Redeveloping former military sites, 2006) defines vacant land

as previously developed land which is now vacant and could be redeveloped without treatment where treatment includes any of the following: demolition, clearing of fixed structures, or foundations, and leveling. The same Database defines derelict land as ''land so damaged by previous industrial or other development that it is incapable of beneficial use without treatment'', where treatment also includes anyone demolition, clearing of fixed structures or foundations, and leveling (L. Loures & T. Panagopoulos, 2007).

landscape is not only as a setting in which to intervene, inserting an indefinite variety of objects but as a tool through which to design and manipulate complex material. The understanding of the temporal and dynamic character of any landscape and design solutions, as well as a design process that facilitates a fair representation of the existing attitudes towards and expectations of the site, is paramount for success. (Langhorst, J. 2004)

PROPOSED SITE

The site is in the central-eastern part of Sardinia strategically located at the port of Arbatax with direct access to the sea on one side and the city of Tortoli on the other. The 35 ha of abandoned former Paper Mill Called locally as: (Ex Cartiera di Arbatax) was once 125 ha of land and the second biggest Paper Mill in Europe which now has been abandoned since 2005. The current owner of the site is the Municipality of Tortolì which has constantly called for a reclamation plan but has not yet come to a solid conclusion.

METHODOLOGY

For the territorial identification of potential participants in the Systemic Design, it is necessary to define a precise spatial methodology of analysis that could be systematically replicable. The flows of matters and energy that cross the territory, allowing the carrying out of the activities of the supply chain, cause not only emissions and waste flow, but they also physically shape the territory. There is, indeed, a strict link between territorial processes and waste escapes determination, which can be considered the spatial result of urban Metabolism together with impacts at the Micro, Meso, and Macro scale. Therefore, the metabolic activities of extraction, production, distribution, and consumption that define the supply chain and the activity of Waste Management, affect resources but simultaneously can generate Land Use Functions and provide environmental, social, and economic services as well. At the same time, they alter the territorial performances, generating

multidimensional impacts and in addition a particular form of spatial impact known as was escape. The starting point is the concept that these metabolic activities are powered by resources (EEA, 2015) that feed the processes that act on the territory and generate in the meantime environmental, social, and economic performances. The European Commission's Thematic Strategy on the Sustainable Use of Natural Resources (European Commission, 2005) states that European Economies depend on natural resources which can be defined as anything that occurs in nature that can be used for economic production or consumption (OECD, 2010) or also that can be used for producing something else (UNEP, 2011). Furthermore, spatial planning in general can condition the use of resources, influencing as well the consumption pattern of an urban ecosystem, because the spatial form of cities has a long-standing impact on the daily resources needed (Dijst, 2013). Consequently, urban ecosystems are undergoing multiple and often contradictory changes from expansion to de-industrialization and land abandonment (McPhearson et al., 2016). Once chosen the activity to analyze, it is necessary to define the land cover that hosts this activity and the subsequent land use. On the one hand, the first represents the observed (bio)physical cover of the earth's surface (Di Gregorio, 2005) and it is formed by three main categories: natural vegetation, crops, and human structure, each one generating a certain number of sub-categories. The main reference for the land cover is represented by the Corine Land Cover (CLC) elaborated by Copernicus. On the other hand, land use refers to the human activities carried out on a certain land cover from a functional dimension (Torricelli, 2015b), and the reference can be represented by the categories of land use proposed by the European Environment Agency through Urban Atlas. Land use is a determining factor that influences the ability of ecosystems to provide services (EEA, 2015).

To create a successful and sustainable reclamation design it is important to recognize and interpret the historic and cultural significance of the landscape and to understand how "landscape ecology and design can invent alternative forms of relationships between people, place, and cosmos so that landscape architectural projects become more about invention and programs rather merely corrective measures of restoration" (Corner. J, 1996). Any attempt to define principles for good design must embody the principles of sustainable development. Building design, landscape design, and urban design must be brought together to deliver a more integrated, skilled, and effective design process. (L. Loures & T. Panagopoulos, 2007).

02
Systemic Design

Alan Berger

The term: "Systemic Design" was first used by Alan Berger American Landscape Architect, in a lecture titled as: "Systemic Design Can Change the world". In this Book Berger defines a methodology to conduct a holistic robust design strategy to achieve maximum sustainability.

Berger has worked in the Italian landscape and conducted a spectacular systemic design for Pontine Marshes in Latina Province. In an Interview he attended in Italy he replied to a question concerning the main issues either being addressed well or not, in landscape architecture, He stated that the main issue for him is that landscape architecture is not doing a great job addressing the larger-scale environmental issues that are currently affecting urbanized regions in the world. Rather, landscape architecture tends to still be focused on discrete locations and places and unfortunately too often on superficial cosmetics. He also added that he is interested in how to creatively reclaim and reuse landscape waste, especially in urbanized areas where environmental systems have been permanently altered beyond recognition and function. (Abitare.it, Interview by Matteo Poli)

With this image in mind, we immediately understand the scope of the interventions of the Systemic Design approach and the large-scale logic behind it.

Systemic Design

It is in urbanized regions that the natural production of the waste landscape should be productively exploited through new investment and strategically networked feedback mechanisms. The approach to deal with this is called 'Systemic Design.
Since the 1970s, Systems Theory and Complexity have been explored in the sciences to provide a new framework for non-linear, non-rational decision making and planning. The science of systems theory has evolved and permeated into many fields since its inception. Some of the most profound experiments in regional planning (think Ian McHarg. architecture (think Buckminster Fuller!, and landscape architecture (think Field Operations) have pedigrees in systems thinking. Read almost any noteworthy

landscape architectural criticism today and you'll find the fingerprints of systems thinking. Terms such as ·open-endedness, flexibility, adaptability, resilience, feedback loops, non-equilibrium,' etc. permeate popular design discourse and are highly acclaimed in Design schools today. (Berger, 2009)

Berger defines waste as a natural process of urbanization and he declares that there is no growth without waste he defines that his conception of systems work is much more substantial, complex, and proactive than this, taking aim at changing the world rather than merely reacting to it. The systemic approach implies that there are larger-scale forces in the built and natural environment that if properly understood, will lead to more intelligent project scenarios as opposed to superficial cosmetics or post-rationalized forms. Systemic Design merges the existing stresses on a landscape with multi-layered, time-based strategies that work to reclaim value and increase sustainability in the built environment. Systemic Design seeks to interact with the environmental, economical, and programmatic stresses across regional territories. Understanding how natural and artificial systems dynamically function in regional territories and small locales, and ultimately feed back into both scales from new design and planning interventions, forms the basis for smarter urban landscape projects in the future. The resulting landscape and urbanism are demonstrably more sustainable (able to live without expensive, infinite inputs) if larger-scale logic is encoded in the smaller-scale proposals. Moreover, the design is more intelligent if the landscape systems are retrofitted with robust plasticity rather than with a delicate balance of elements in need of constant maintenance preservation. (Berger, 2009)

Wastescapes and Wastescape determination

As already specified, "cities are not static objects, but active arenas marked by continuous energy flows and transformations of which landscapes and buildings and other hard parts are not permanent structures but transitional manifestations" (Berger, 2006b, p. 203). According to Lynch and Southworth (1990, p.146), waste "is worthless or unused for human purpose. It is a lessening of something without useful results; it is loss and abandonment, decline, separation, and death. It is the spent and valueless material left after some act of production or consumption, but can also refer to any used thing: garbage, trash, litter, junk, impurity, and dirt. There are waste things, wastelands, waste time, and wasted lives". Similarly, Berger (2006, p. 203) states that "contemporary modes of industrial production driven by economical and consumerist influences contribute to urbanization and the formation of waste landscapes – meaning actual waste (such as municipal solid waste, sewage, scrap metal, etc.), wasted places (such as abandoned and/or contaminated sites) or

wasteful places (such as oversized parking lots or duplicate big-box retail venues)". Waste in its spatial connotation is the outcome of urban processes that characterize the activities of the supply chain, i.e. the set of activities that feed the life cycle of a product from the phase of extraction of raw materials up to the disposal of waste materials. The supply chain, in other words, represents the distribution chain of a product or service from the supplier to the customer, starting from the raw materials necessary for its realization, then moving on to the realization of the product, and subsequently to the phases of management and distribution to the customer, which carries out the consumption phase. Every single phase determines the production of waste products and tracing the waste streams starting from the production of the phase of the products allows for analyzing the consumption patterns and identification of better paths to be taken, facilitating the transition from the linear economy model to the circular one. In this perspective, urban ecosystems are characterized by the presence of portions of territory at the end of their life cycle i.e. wasted landscapes or waste escapes (Amenta and Attademo, 2016; Amenta and Van Timmermen, 2018). The concept of Wastescapes derives from that of Drosscapes coined by Berger (2006), i.e. wasted landscapes that are an outcome of metabolic processes. Drosscapes "accumulate in the wake of the socio and Spatio – Economic processes of deindustrialization, post-Fordism, and technological innovation" and they "are located in the declining, neglected, and deindustrializing areas of cities" (Berger, 2006, p. 239). Consequently, there are physical components of the urban structure that lose their function and, at the same time, the economic and social recognition of their usefulness: what occurs is the definitive or temporary suspension of a determined use of a certain space, with its consequent abandonment, the subsequent re-use, and more rarely and more distant in time Its full replacement. Wastescapes are an inevitable result of the processes of economic growth that produce waste and emissions that damage land, water, fields, but also buildings, and infrastructures. Therefore, the flows of matter and energy and those of waste that feed or come from the activities of the supply chain, respectively, are also able to shape the territory in its physicality. This generates the development of portions of territory that are no longer able to provide goods and services and, finding themselves at the end of their life cycle, they are like "waiting for spaces" or terrain vague. The activation of new urban regeneration processes may be able to give new functions to these portions of territory and reconnect them to the surrounding urban fabric. This means that the real challenge is to integrate these portions of land into the functioning of urban ecosystems (Berger, 2007), turning useless matter into useful matter, as happens in the waste recycling system (Erz, 1992; Strasser, 1992), avoiding further land consumption. The disuse can be understood as a "natural" phase of the life cycle of the functions and spaces predisposed to welcome them (Baiocco et al., 2017). This vision determines the consideration of urban ecosystems as endowed

with a metabolism capable of digesting, assimilating, and feeding the succession of cycles of production and where space is always small with respect to the number of flows (economic and human) that cross it. Definitely, waste can be interpreted as a natural and unavoidable component of an evolving and dynamic urban ecosystem and represents an indicator of its healthy growth (Berger, 2007). REPAiR projects identify 5+1 categories of waste escapes that are grouped in Drosscapes and operational infrastructure of waste, the latter represented by the plants dedicated to Waste Management (WM) (Geldermans et al., 2018):

DROSSCAPES
1. Degraded land
2. Degraded water and connected areas
3. Declining fields
4. Settlements and buildings in crisis
5. "Dross" of facilities and infrastructures
+
6. OPERATIONAL INFRASTRUCTURE OF WASTE

Degraded lands inside the site in the Arbatax abandoned former paper mill accompanies degraded water quality of the connected lagoon with declining fields in the buffer of the lagoon and also dross of infrastructures in the site area creates a state of a complete drossscape that could be reclaimed and re-imagined in a safe productive system that activates the landscape it rises from.

How to map wastescapes?

For the territorial identification of wastescapes, it is necessary to define a precise spatial methodology of analysis that could be systematically replicable. The flows of matters and energy that cross the territory, allowing the carrying out of the activities of the supply chain, cause not only emissions and waste flow, but they also physically shape the territory. There is, indeed, a strict link between territorial processes and wastescapes determination, which can be considered the spatial result of UM together with impacts at micro, meso, and macro scales. Therefore, the metabolic activities of extraction, production, distribution, and consumption that defines the supply chain and the activity of Waste Management, affect resources but simultaneously are able to generate Land Use Functions and to provide environmental, social, and economic services as well.

Dismissed Industrial Areas

According to ISTAT, about 3% of the entire Italian territory is occupied by abandoned industrial areas. In Italy, there is a specific distinction between "dismissed industrial areas", which are areas in need of processes of redevelopment, and "contaminated sites", which require processes of reclamation. According to the Environmental Code, dismissed sites, in general, can be defined as sites where production activities ceased. Dismissed sites can be:

- Contaminated;
- Potentially contaminated;
- Non-contaminated.

In the last decades, because of the economic crisis and the changes in the productive sector (especially in the most advanced countries), there has been a progressive reduction of industrial activities. This process has determined the born of large dismissed areas with the presence of abandoned industrial buildings, very often located in peri-urban areas that are strategic for urban development. As a consequence, the re-development of these areas constitutes a current problem of considerable interest, characterized by economic, social, and environmental repercussions and it represents as well an unavoidable opportunity for activating urban regeneration actions and for the valorization and re-connection of peri-urban areas. For this reason, new operational methods and techniques are required, in compliance with environmental compatibility
(Arbizzani and Materazzi, 2012).

The disused industrial areas are also generally already served by the main infrastructures and are often located near railway plants or important sections of the road network that can determine good accessibility, therefore the return of these areas to the city can constitute an important occasion for the redesign of the local urban fabric (Aiello, 2012). The recovery of abandoned industrial areas connected to the location of new important urban and productive functions can be configured as a unitary intervention at the metropolitan level, able to define places and relationships related to a large pool of users and able to renew and increase the points of reference in the vast territory (Miano, 2005).

The Third Landscape

The third landscape is the space unattended by man and ruled over by natural evolu-

tion; included in this category are the nature reserves, deserts, and mountain summits, the untouched spaces that remain in their natural state. Plants that vegetate in hostile conditions, appear unannounced, grow more than expected and then die in one place only to reappear a few meters away have always been a key figure of the métis: sharp metaphors that are far removed from the linear, predictable and appeasing rationale of much Modernist thought. In this little book by Gilles Clément, a landscapist of the Ecole Nationale Superiéure pour le Paysage in Versailles, plants are real aids to observation, visibly showing change and serving as prompts for reflections on the landscape, actions, and aesthetics.

The landscape first and foremost. An interstitial landscape that Clément calls the Third Landscape, meaning what is neither light nor shadow: the remainder, separate both from the spaces never exploited ("primary ensembles"), and the protected spaces of human activity ("reserves"). A fragmentary Territory, imbued with great symbolic value but nevertheless residual, undecided, suspended. diversity (to which we usually attribute the same, if not greater, importance as the social differences that are showing signs of suffering in today's urban environments). Clément's text is constructed around spaces of this kind; it is divided into short chapters that retrace the origins of the Third Landscape, its extension, character, statute, challenges, mobility, evolution, scale, limitations, and its relationship with time, society and culture. These are the 12 sections into which the Manifesto proper is organized, like the argumentation that precedes it. Within an assertive language reminiscent of another famous Manifesto, collectanea, from a few years ago (Mouvance. Cinquante mots pour le paysage , Paris, 1999), the Third Landscape changes, vitalism, constant shifting for subsequent adaptations, which alternate shock Darwinian moments and slow Lamarck moments. Mouvance is the affirmation of biological order.

Acting on the Third Landscape is going with, not against nature, complying, observing, and intervening as little as possible. Avoiding the regulations and remaining indifferent. Avoiding the assumption of wanting to create models. The game of leaving things as they are (and as they evolve) does not, of course, avoid a decision. The action is there and it is traditional, wise, calling the skills of observation, classification, and deduction into play. It is that of the scientist, not of the DIY enthusiast, although in this case you start from what is already there and try to turn circumstances into opportunities. The gardener, however, observes and gathers experience. The garden is a laboratory in the sense of the strictest disciplines, a closed space. Even when planetary, it communicates a sense of the finite (Clément,Le jardin planétaire , Paris, 2000). As noted by Maria Valeria Mininni, the expanded microcosm of the garden is where a different concept of nature planted solidly in contemporary times takes firm root. It is

no longer autistic heterotopia, that other place in the weave of the modern city. Nor is it the representation of a possible city, a utopia, and the symbolic form of a balance, the place in which to develop ideas on the urban. These two forms, heterotopia, and utopia have constructed a major bond between garden and city, on which some urbanists (eg Bernardo Secchi) have insisted. Here the plan is reversed. The city fades and the friches come to the fore.

Form. The garden is not a legacy: a further radical disalignment from urban thought. It is not something that can be handed down and is of value for this reason. Nor does it require an aesthetic approach in the commonest sense, but rather an aesthetic bound to science (the afterword on this) that plays nonetheless with the décalage, the change in scale, the surprise. Challenging Dadaism and leaving the harsh concepts far behind it, highlighted against a background (Mininni) of green belt, fingers, green hearts, with which people worked, throughout the 1990s at least, drawing them back from remote experiences and readapting them to the most recent concerns of planning that should be sensitive to the landscape. (Manifesto del Terzo Paesaggio , Gilles Clément Quodlibet, Macerata 2005)

Figure 1: Third Landscape - Image showing natural habitat appeared after 20 years of abandonement.
Source: www.sardegnaabbandonata.it/cartiera-di-arbatax/

Figure 2: Third Landscape - Image showing natural habitat appeared after 20 years of abandonement.
Source: www.sardegnaabbandonata.it/cartiera-di-arbatax/

03
Introduction to site

Figure 3: Abandonment - Brutal BeautySource: https://www.youtube.com/watch?v=PoH93qy_ipY

Site Location

Figure 4: Location of the site - Map showing the location of the site in relation to the region and urban fabric.
Source: Author

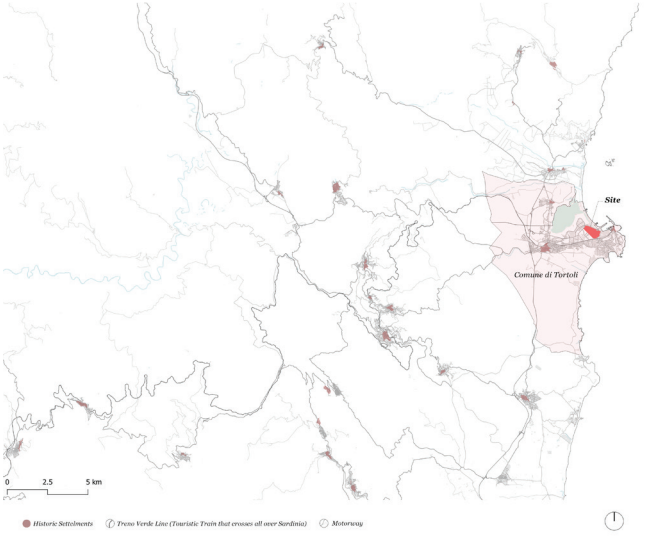


Figure 5: Map showing comune of tortoli - cities and built up areas in relation to site.
Source: Author

The site is in the central-eastern part of Sardinia strategically located at the port of Arbatax with direct access to the sea on one side and the city of Tortoli on the other. The 35 ha of abandoned former Paper Mill Called locally as: (Ex Cartiera di Arbatax) was once 125 ha of land and the second biggest Paper Mill in Europe which now has been abandoned since 2005.

Figure 6: Sattelite image of the regional scale - Image showing Tortoli and Arbatax in a frame and the location of the site in relation to the infrastructures.
Source: Author

Figure 7: Site Sattelite image - Sattelite Image of the Paper Mill site.
Source: Author

Tortolì

The harbour and the coastal towers of Arbatax

The hamlet of Arbatax is situated at the centre of the Sardinian eastern coast, in a place where the coastline is characterised by promontories and inlets, close to Cape Bellavista and to the pond of Tortolì, in an area that has always been favourable for the human settlement. This coastal structure has encouraged the exploitation of the site particularly thanks to the security of the natural harbour and that is why the researchers have situated the Phoenician-Punic and then Roman harbour at the pond of Tortolì, even if it is not impossible that that were some harbour structures also in the site of the actual harbour of Arbatax. Whatever was its position, it is certain that it represented an important stop-over along the commercial routes that led towards the central-western coasts of Italy or towards the North Africa, as attested by the finds of amphorae and of metal ingots in the sea just before Cape Bellavista. The place kept its importance also in the following ages so that between the 16th and the 17th century they built three sighting and defending towers to protect the territory from the pirates' incursions. The towers of San Miguel and that of San Gemiliano are still in place, while a third, called "di Largavista", was demolished during the second half of the 19th century to make way for the lighthouse of Bellavista. In Sardinia the construction of the first towers for the coastal defence dates back to the first years of the 8th century A.D., when the Arabs started to assault the island's coastline. From the 9th to the 15th century, during the age of "Giudicati", they built numerous fortifications to control the Sardinian coasts. During the Spanish domination of the island, in particular at the beginning and during the first half of the 16th century, the pirates' incursions increased considerably so that in 1570 they started to plan a network of fortresses to defend the coastline. In 1587 the king Philip II of Spain created the "Royal Administration of the Towers", entrusting it the task to build new towers, to provide for its management, to enlist the soldiers equipping them with weapons. The phenomenon of the piracy stopped at the beginning of the 19th century and thus the coastal towers lost their role and functions. Generally speaking, the towers were erected in strategic spots from which it was possible to control wide sea stretches and to communicate through bright signals with the nearby towers. The tower of San Miguel, originally called with the Arabian name of "Arba a Tasciar", that is "the fourteenth tower", probably gave its name to the hamlet of Arbatax, which in fact spread in the course of the centuries all around it. Its imposing structure, built in the second half of the 16th century with the use of granite and po phyry blocks, is 15 metres high, presents a truncated cone shape and at the interior is divided in two storeys that are linked by an inner stone staircase. The tower controlled the harbour and was equipped with cannons and punt-guns and in the course of time it faced lots of attacks and landings.

Figure 8: San Gemiliano Nuraghi - Source: TripAdvisor.com

Figure 9: Areal View of the Site - Source: TripAdvisor.com

In 1846 the building ceased its role of sighting and defending structure to host the headquarter of the "Guardia di Finanza". The tower of San Gemiliano, built in 1587, was originally called with the Arabian name of "Taratasciar" ("the thirteenth tower"); in the 17th century it was called "tower of Zacurru" and only in 1767 it took the present name. It stands at an altitude of 43 metres above the sea level and on a small pro ontory monitoring the bay of Porto Frailis, at about 4 km from the town of Tortolì. From the building you can control about 25 km of coastline. Erected with the use of local granite blocks, it presents a truncated cone shape and a slender structure with a 7-metre-diametre and a remaining height of 12 m. The 4-metre above- ground entrance, which assured a better protection of the tower, was reachable by a rope or wood ladder. The small room where the soldiers stayed was vaulted with a 13-square-metre dome, provided with two embrasures for the guns.

Girasole Nuraghe of Santu Tomau

The village of Girasole lies in a particularly advantageous position, at about one kilometre from the sea. The human presence in the territory dates back to the Middle Bronze, as attested by four nuraghi, among which Nuraghe Santu Tomau. Even if it is not in good conditions, it is characterized by an imposing polygonal structure: it was probably part of a complex structure and was built with big granite blocks; it keeps 3-m-high walls and its inner chamber. At a brief distance from the nuraghe, in the locality of Birdesu, the finding of some Roman ceramic fragments attests that the area was frequented also during the successive ages. According to some researchers, Girasole could be the Sulpicius Portus cited by the old sources (Antonine Itinerary, 3rd-2nd century A.D.), but there are no evidence that could confirm this theory; it is probable that the Phoenician- Punics built a harbour on the Ogliastra's coast that could be situated close to the actual pond of Tortolì. The origin of the toponym of Girasole appears in the form of "Gelisoi" in a 1140's document. At the centre of the village stands the church of N.S. di Monserrato, built between the 16th and the 17th century.

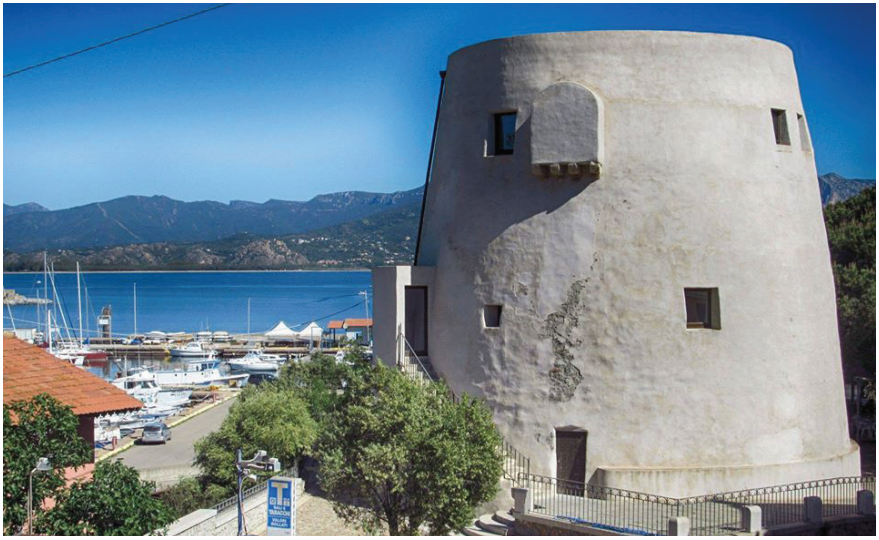


Figure 10: Torre di Arbatax -
Source: vistanet.it

Figure 11: Santu Tomau Nuraghe-
Source: sardiniapost.it

The History

The history of Tortolì is closely linked to that of the Arbatax paper mill, the largest factory in Ogliastra and the second of its kind in Europe.

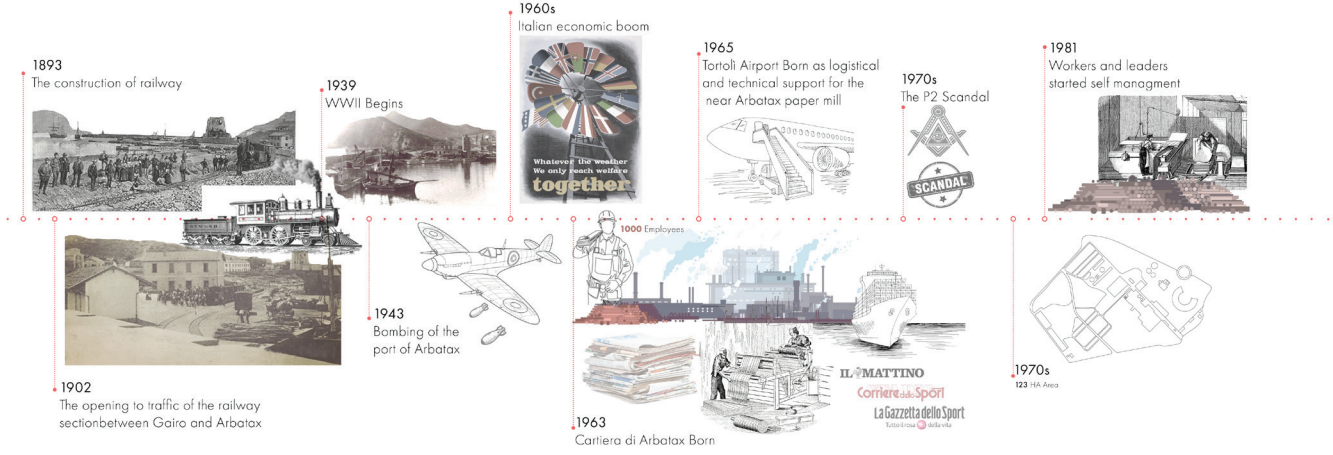
We are in the 60s, the years of the economic boom in Italy, and precisely in 1963 when the Arbatax paper mill was born: it spread over 120 hectares of land, powered by a gigantic thermoelectric power plant, and was one of the most modern and avant-garde structures of the period.

With its continuous machines called Arborea and Bonaria (the latter activated in 1970), about 400 tons of newsprint were printed a day and then specialized in other sectors such as weekly paper, and telephone books.

Figure 12: Time Line - Arrival of Significant Events.
Source: Author

In those years the workers were about 730 with an induced that employed as many workers, not to mention the dockers, truck drivers, and maintenance workers who lived thanks to the paper mill.

In the 1970s, salaries were even higher than those of state employees, working as a papermaker was a privilege and the economy of the area underwent a significant economic increase: the first 500 and 126 arrived and the workers from neighboring countries moved to Tortolì, thus helping to make it a real city.



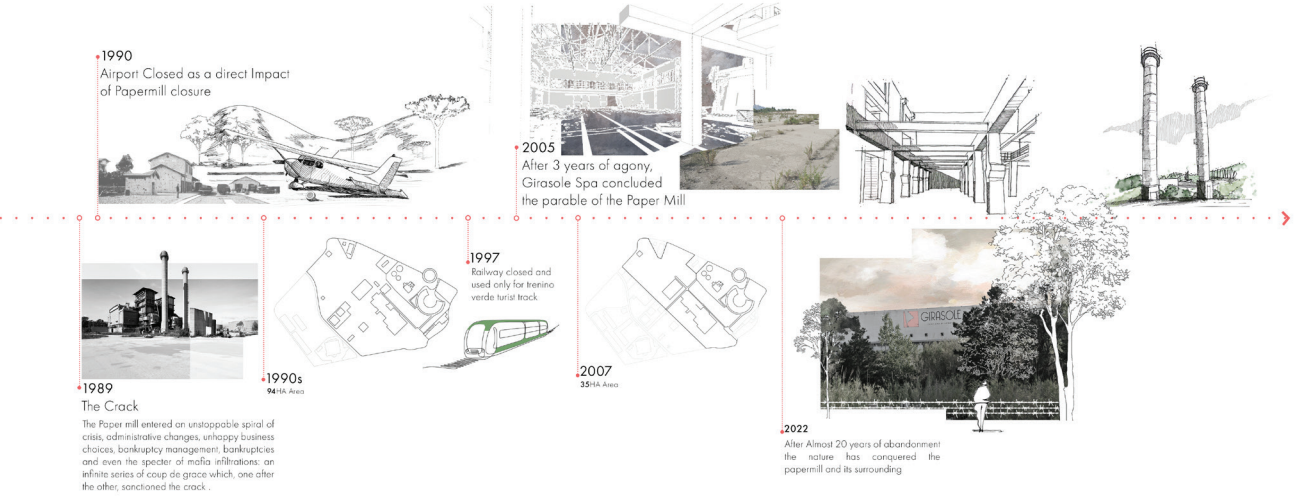
With the advent of the paper mill, the Tortolì-Arbatax airport was also born, which also managed two flights a day but not only: the paper mill had its ships, the Latina and the Arbatax, with which the finished products were transported. exported throughout the Mediterranean basin.

Before the paper mill, the economy was solely agro-pastoral and based on fishing but with this new reality the port of Arbatax, which previously only welcomed fishing boats, knows the traffic of merchant ships with the large oil tankers that once or twice a year brought the crude oil it fed. the power plant.

In the 1970s, the paper mill almost unscathed the political earthquake caused by the acquisition by Fabocart of Giovanni Fabbri, a Milanese figure linked by close ties with Licio Gelli's P2.

Then came self-management, bankruptcies, and various administrative changes, including the extreme rescue attempts by the Cagliari entrepreneur Nichi Grauso. The last management was that of the Girasole SPA, whose writing still stands on display in one of the buildings. The epilogue is what is expected in these cases: the dismemberment of the paper mill with the demolition of its buildings and the two continuous machines that are dismantled and fed to the foundries.

Of the initial 120 hectares, only 35 remain today.



04
Case Studies

Emscher Park

Rhur Valley, Germany
17 Cities, 300 sq km, over 20 years

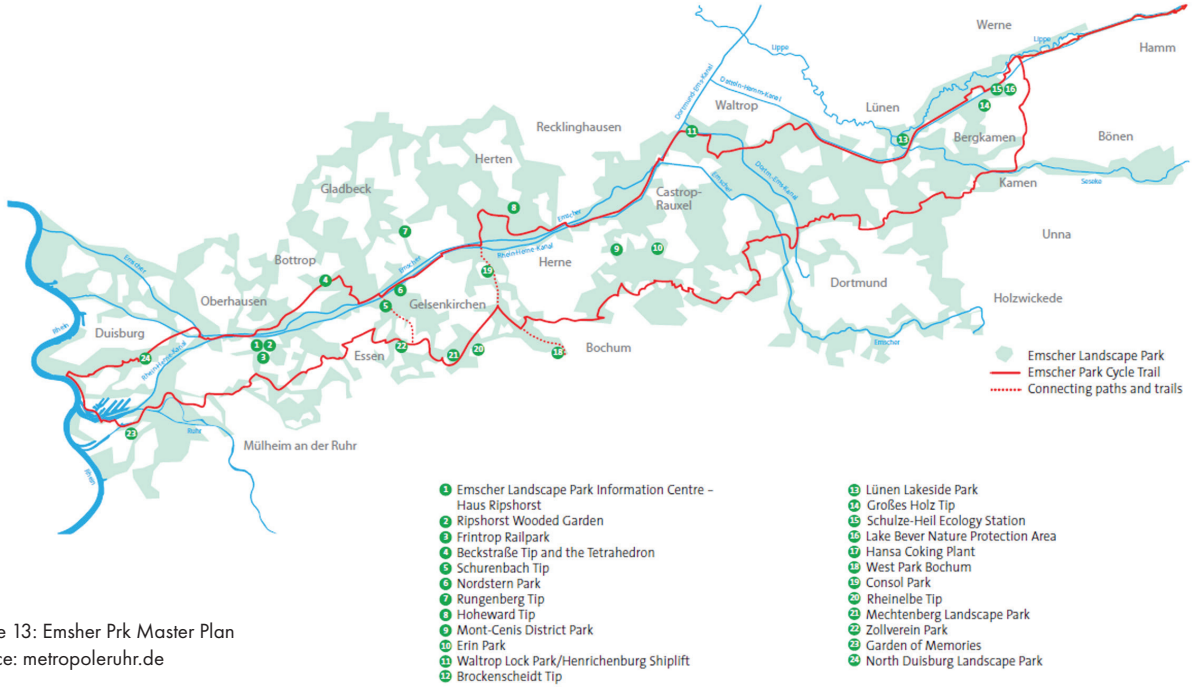


Figure 13: Emsher Prk Master Plan
Source: metropoleruhr.de

The Emscher Park project in the middle of the Ruhr area - Germany's most industrialized zone is one of the most comprehensively thought through and innovative urban regeneration projects. Emscher Park in Germany is the name given to the 70 km long area comprising 800 sq. km straddling the Emscher river in which 2 million inhabitants live in 17 cities. It lies at the heart of the Ruhr area - the Ruhrgebiet - a dense urban agglomeration of 5.3 million people and one of Europe's most heavily urbanized and industrialized areas. It is within the Land North-Rhine Westphalia with 17.6 million people and is located around the valleys of the Lippe, Ruhr, and Emscher rivers and their confluence with the river Rhine. It includes the principal cities of Essen, Dortmund, Bochum, Gelsenkirchen and Duisburg. It has been a crucible of intense economic and social development in both the past and current industrial revolutions.

In The Emscher Park, The sub-title of the 10-year project is: "A Workshop for the Future of Old Industrial Areas" which encapsulates the core concept of an experimentation zone, mutual learning, and learning by doing. The main purpose of the strategy was to show models of the future and the major role the public sector could play in making it happen. The over 100 projects cluster around five themes for which proposals were invited, they are :

° Ecological regeneration of the Emscher river system - the complete rebuilding and 'renaturation' of 350km of polluted watercourses over a 30 period.

° Working in the Park - creating a chain of 22 science and technology centers on old industrial sites.

° Housing construction and integrated district development - refurbishing or building new 6000 properties according to ecological and high aesthetic standards.

° New uses for old industrial buildings - finding radical alternatives instead of demolishing former mines, steelworks, or factories.

° Creating an Emscher landscape park and series of seven green corridors to distinguish major centers from each other.

An industrial heritage scale park system born out of an intense industrial fabric that once was the world's steel capital. This project is a spectacular example of intelligence systemic regeneration on a large scale.

The Emscher project was a deliberately planned cluster of projects that simultaneously pursued goals of economic restructuring, physical rehabilitation, and environmental improvement: What makes the IBA outstanding is the synergy between them, which makes the whole achievement much greater than the sum of the parts. The project has strong creative elements undoubtedly, yet the extent to which Emscher has become the seedbed for an innovative milieu remains in the air.

Landschaftspark Duisburg-Nord

In 1991, a co-operative-concurrent planning procedure with five international planning teams was held to design the park. Peter Latz's design was significant, as it attempted to preserve as much of the existing site as possible (Diedrich, 69). Unlike his competitors, Latz recognized the value of the site's current condition (Weilacher, 106). He allowed the polluted soils to remain in place and be remediated through phytoremediation and sequestered soils with high toxicity in the existing bunkers. He also found new uses for many of the old structures and turned the former sewage canal into a method of cleansing the site.

Figure 14: Landschaft Park
Source: Duisburg.de

The park is divided into different areas, whose borders were carefully developed by looking at existing conditions (such as how the site had been divided by existing roads and railways, what types of plants had begun to grow in each area, etc.). This piecemeal pattern was then woven together by a series of walkways and waterways, which were placed according to the old railway and sewer systems. While each piece retains its character, it also creates a dialogue with the site surrounding it. Within the main complex, Latz emphasized specific programmatic elements: the concrete bunkers create a space for a series of intimate gardens, old gas tanks have become pools for scuba divers, concrete walls are used by rock climbers, and one of the most central places of the factory, the middle of the former steel mill, had been made into a piazza. Each of these spaces uses elements to allow for a specific reading of time.

The site was designed with the idea that a grandfather, who might have worked at the plant, could walk with his grandchildren, explaining what he used to do and what the machinery had been used for. At Landschaftspark, memory was central to the design. Various authors have addressed the ways in which memory can inform the visitor of a site, a concept that became prevalent during Postmodernism.

Memory has re-emerged as an important aspect of design, and has been addressed by authors such as Sebastien Marot, Frances Yates, Robert Smithson, and Peter Latz himself. For them, memory does not equal preservation but instead has a transient quality. It implies a re-representation or understanding of the past, as memories constantly shift and change as one experiences life. Marot believes that the memory of a site should be used as a design strategy, as it shows depth and a process of connection. Yates' argument for the importance of memory comes out of her concern that architecture has become too uniform, removing the particularities of a place. These idiosyncrasies have a history with the art of memory which uses the principle of association with places. Smithson's assertion, in his article "A Tour of the Monuments of Passaic," is similar, in that memory recalls the past but in a way that applies it to new things. Finally, Latz claims that interrelations must be made concrete and visible and that the viewer will create their own picture of a place, not the designer (Latz, 94, 96).

These ideas of memory encompass Landschaftspark. A series of pathways at multiple levels connect sites scattered throughout the project, allowing visitors to construct their own experiences. These sites include the bunker gardens, where the fern garden is located. This garden was formed using railroad ties collected from other locations at the site, which might remind someone of the old railway that is now an entrance to the park. It is similar to the way Smithson's essay, "A Tour of the Monuments of Passaic," incorporates elements of the past to aid in giving meaning to things of the present

(Marot, 42). By walking through the garden, an individual's memory may be sparked when they see the typical railway ties. This might then reveal new connections, as these railway ties occupy a different space than the long lines with which they are typically associated.

The sewage canal, which was believed to be in the same location as the 'Old Emscher' river, could not remain as it existed on the site, and was placed underground (Diedrich, 73). A new canal has taken the place of the sewage canal but is now flowing with fresh rainwater. Instead of creating a more "naturally" shaped waterway, this new canal, the Emscher River, was kept as straight as the canal before. The canal aids in one's understanding of water processes and changes in time. Markers made by soil mounds (these also break up the culvert form) allow the depth of the water to be read by the visitor to the site. Here the visitor is able to understand on a seasonal basis the process of the site and mark their experience of the park by how high the water was.

Finally, Piazza Metallica also works with ideas of temporality and memory: the landscape architects took 49 steel plates that formerly lined the foundry pits at the site (Diedrich, 70) and installed them to mark a gathering place, intended for events and performances. However, the steel plates are not meant to last; rather, they will gradually erode and decay, portraying the natural processes occurring at the site (Steinglass, 129). In a way, this piazza represents the site as a whole: as the plates decay (like the other steel on the site), a succession of plants will grow between them. Plants will eventually fill the space, with the remains of the rusted steel among them.

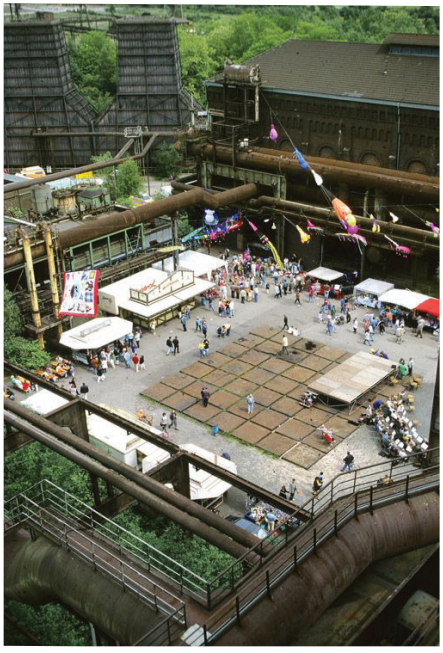


Figure 15: Piazza Metallica - Image showing Piazza Mettalica hosting a pop up market
Source: Duisburg.de

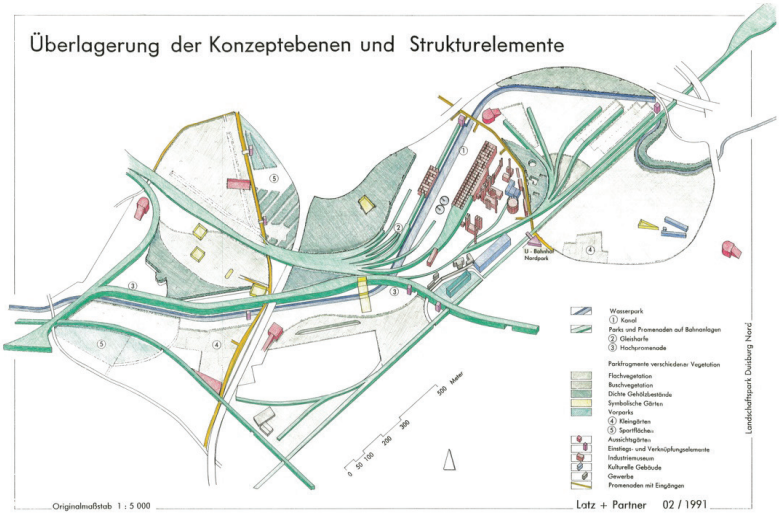


Figure 16: Landschaft Park Initial Masterplan
Source: Duisburg.de

zollverein park

approach and handling of Zollverein is based on several principles: emphasis on the architectural ensemble, restraint in landscape design, reduction of elements and materials, respect for the existing, preservation of industrial origin, acquisition of space by the visitors, making the transformation from a hermetically sealed-off industrial site to a public tourist highlight visible and experience-able. Zollverein Park – which has developed on industrially embossed terrain and does not deny its origins by gently adding and classifying – keeps its unique selling point by the high-contrast interacting between the clear, simple forms and structures of industrial architecture and the variety of spontaneous vegetation. The shape and outer appearance of Zollverein Park are being developed by a systematic and continuous maintenance.

The long-term concept of development by maintenance goes hand in hand with the gradual realization of the elements of Zollverein Park. Over a relatively long period, a forbidden zone develops to a park which is ready to get explored. It is not about establishing a museum-like industrial landscape, yet about composing a landscape with already existing elements; this concept consciously includes historical and current developments and signs in a credible manner and offers surface and room for future developments and purposes – open to interpretation and offering a pragmatic dys function.

With the concept of design by maintenance, the gentle approach to emphasizing the existing vegetation and to dispensing with any large intervention is linked. The vegetation is given time and calmness to develop naturally, and any potential intervention in the existing and future vegetation is being executed very carefully. Therefore, Zollverein became a place that develops a special atmosphere and energy out of itself. The cautious care and maintenance is at the same time easy to be arrangeable and practicable, and relatively cost-effective.

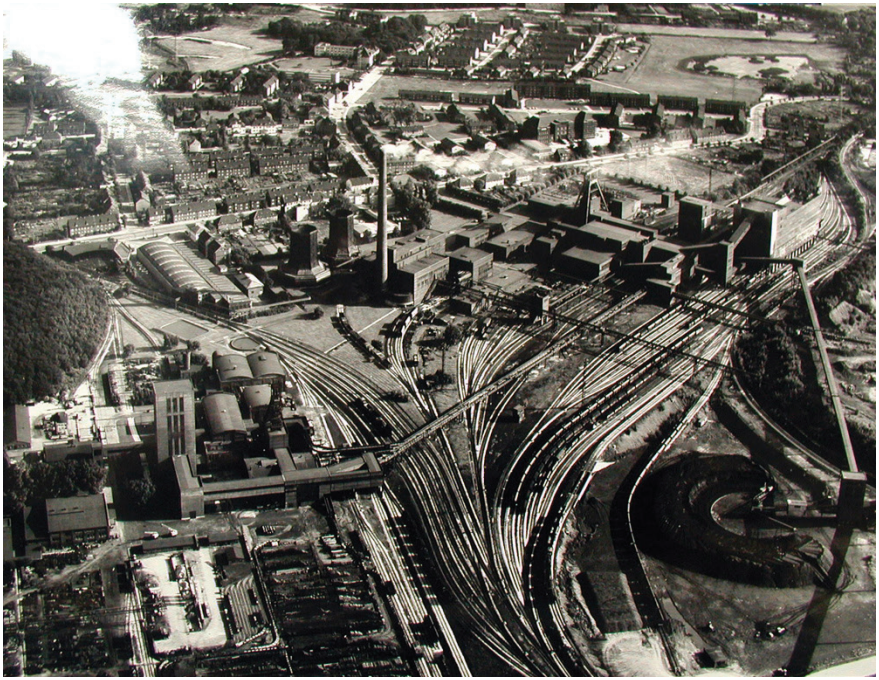


Figure 17: Areal Image of Zollviren Park
Source: http://recycledlandscapes.alterv-ista.org/

With its status as world heritage site, Zollverein has a very high radiance and attraction for the city of Essen and the Ruhr region. At the foreground is the impressive industrial architecture of the mine plant. The open spaces have an unobtrusive look which creates a surface to take an appropriate effect on the architecture; they complement the ensemble to a formal framework that makes the dimensions of the site tangible. Zollverein Park is an exceptional open space, which offers a unique experience with its complex offer of open spaces in conjunction with the mine facility, and attracts tourists and local residents equally. The visitor is invited to individually discover the park.

Figure 18: Public Spaces among industrial remainings.
Source: urbannext.net

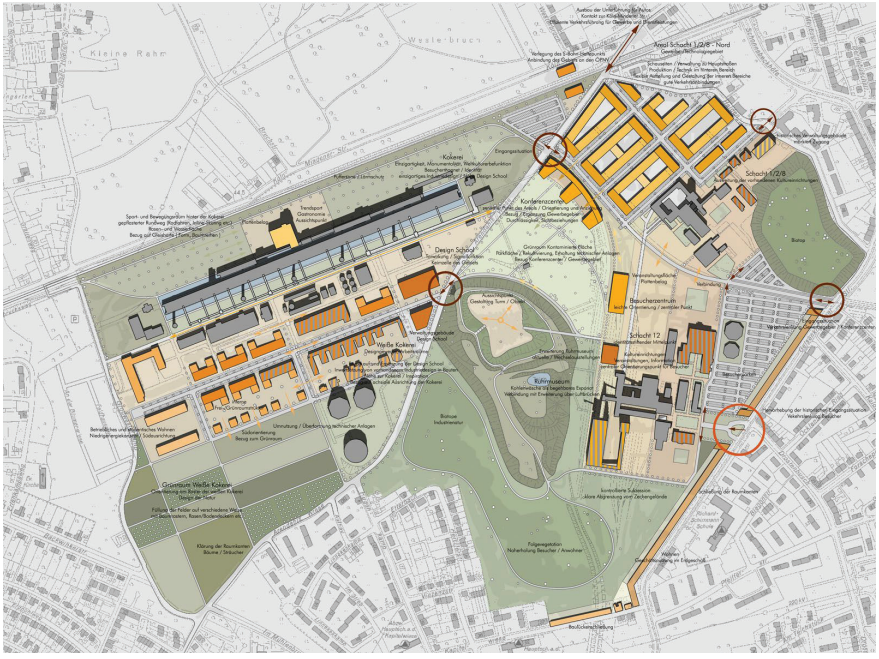


Figure 19: Zollviren Park Master Plan Source: landezine.com

Parco Dora, Italy

From Turin's largest intra-urban industrial wasteland emerges a park near the city centre.

The industrialisation of Turin began at the end of the 19th century along the banks of the River Dora. It reached its zenith in the early 20th century with the construction of the Fiat Ferriere Piemontesi steel and sheet metal works and the Michelin tyre factory. The factories shut down in the general decline of the industry during the 1980s. They left a large area of urban dereliction in the city centre, in addition to many small pockets of disused land.

An urban renewal programme (Programma di Riqualificazione Urbana PRIU) was launched in 1998 to regenerate these areas of post-industrial dereliction and to give them a new use. Reminiscent of a necklace, the interventions line up along a development axis called the "spina" (backbone). With 45 hectares "Spina 3" is the largest project within the comprehensive structural redevelopment. Due to the positive inclusion of its industrial heritage the Parco Dora signifies a new understanding of inner urban landscapes that reflects the transition of society.

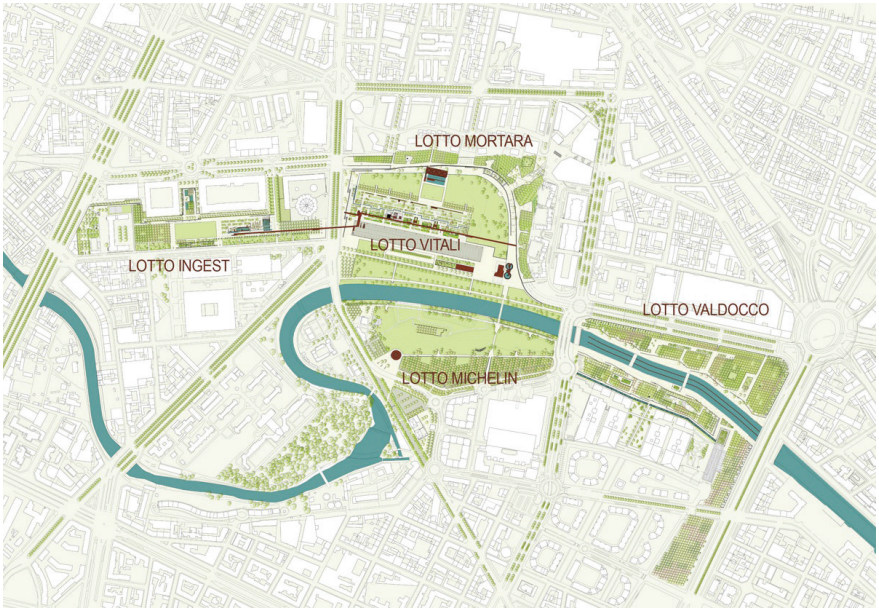


Figure 20: Parco Dora Masterplan.
Source: acomeambiente.org

Figure 21: Children Playing across a water chanel in Parco Dora.
Source: guidatorino.com

The park comprises five separate areas ("Lotti"), three of which are named after the industrial companies that used to occupy the site: Ingest, Vitali and Michelin, in addition to Valdocco North and Corso Mortara, situated above the new tunnel. The site is dominated by the River Dora, main traffic arteries and new residential areas, but its true and unique character is derived from the remnants of its industrial past.

The connection between the park's five areas and the links into the surrounding neighbourhoods were an essential element in the sustainable concept for the new park. The aim was to incorporate the individual character of each area, to strengthen and enhance them with new elements and create a unified park experience.

Constituent elements

The following elements or "layers" determine the content and spatial framework of the Parco Dora:

...what was left of industry

The most important elements are the large hall of the sheet metal works in the centre of the park (Capannone di Strippaggio), the widely visible Michelin cooling towers, the substructure of the Ingest laminating works and the concrete canal of the Dora lined with rows of massive supports in Valdocco.

The element water

Water in various forms influences the perception of the park. A six-metre level change reminds of the force of the river that once shaped the topography in the north of the park. In the west, the Dora looks natural, with tree-lined banks that change their appearance with the seasons. In Valdocco, the eastern section, the river was completely covered by buildings and is still concealed by a massive concrete cover. Cooling towers, canals and slurry tanks evoke the importance of water in industrial processes. The embankments of the Dora in the west will be opened so that the river can be experienced once again. The cover will be removed in the east and the Dora made into a "wild river" flowing over "rocks" made of concrete. The cooling and slurry basins will be integrated into a sustainable water management system that harvests rainwater and stores it for irrigation use and temporary water features.

Linking elements

Promenades, ramps, steps and bridges connect the five different areas and help to create one large continuous park.
The most important and central linking element is the Passerella, a 700-metre long elevated walkway made of steel which connects the three northern park sections. It starts at the promenade above the new cover of the Corso Mortara, crosses Vitali and Via Borgaro at six metres height and ends at the gardens of Ingest. The walkway provides a new layer of perception and vistas which extend beyond the limits of the park.

Space defining vegetation

The scale of the massive and tall buildings is emphasised by the level change in the north and still dominates the park. Tree planting is used to define the space and create buffer zones that screen the public recreation areas inside the park from the residential use in the immediately vicinity, and facilitates a range of activities in the shelter of the tree canopies. The large copses, avenues, clumps of specimen trees and shrubberies will make the surrounding buildings recede into the background over time. They will frame the remnants of the industrial past and give the former manufacturing site a new face.

The five areas of the park:

Ingest

Ingest is the narrowest area of the park with the most design input. At the uppermost level carefully designed squares and promenades link into the adjacent built-up areas and form the entrance points in the west of the park. Ramps and steps along six-metre high walls lead to the southern part, which offers space for many different activities as well as contemplation.
The impressive substructure of the former laminating works was transformed into water gardens and the gutted building into a "hortus conclusus", which screens the park from the road. A line of imposing steel columns supports the elevated walkway that leads across Via Borgaro to Vitali in the centre of the park.
The elevated viewpoint reveals the harmonious interplay of sacred and industrial architecture – the seven towers, the industrial chimney that was transformed into the campanile at the new Santo Volto church by Mario Botta and the tall steel columns at Vitali.

Vitali and Corso Mortara

The huge structure of the hall at the former Vitali steel mill forms the fascinating and vibrant centre of the park. After the outer skin and large sections of the roof had been dismantled, the 30-metre high red steel columns now look like a "futuristic jungle". Lush vegetation and public life have taken over this artificial environment, the vast concrete towers and foundations are being turned into fantastic playgrounds.
The section of the hall that still has a roof has become a sheltered multi-functional event space.

In the north, the grid of the columns extends towards a large meadow with the trunks of flowering trees. The space within the park is contained by the wall of the new road tunnel. A broad promenade with pergolas and tree canopies links across it to the adjacent residential area. Not only does it provide a pleasant environment but also offers exceptional views of the landscape that has developed since the demise of the industries.

The Passerella crosses the steel heart of the park from the west, traverses the adjoining meadows and leads to the new "city balcony". A wide ramp with tree planting along the tunnel wall connects the two levels of the park which are flanked by the impressive Vitali cooling towers.

The towers and the slurry basins now hold clean water. They are part of the storm-water management system that collects rainwater from roofs and surfaces in open rills and channels, and stores it in pools and cisterns. A light installation projects the play of the waves onto the walls of the towers.

Night-time illuminations turn the industrial monuments into widely visible landmarks and create a mysterious new world on the inside. The lower level of the "blue hall" is softly lit, light bands follow the walkway and trace the outline of the former hall.

Michelin

The site of the former Michelin plant is developed into a spacious meadow park that is characterised by its landscape and topography. A newly constructed tidal pool opens up the edge of the Dora; the excavation material is used in a sheltering earth sculpture towards the road and the buildings. A path along the river allows access to the water, steel bridges cross the pool and link up with a footbridge to Vitali on the opposite bank. Rows of different tree species are planted on the shallow slopes of the earth sculpture where they provide shadow. A "high route" follows the crest and offers views of Ingest and Vitali, as well as impressive vistas to the Superga pilgrimage church in the east and the Alps in the west. The widely visible landmark of the cooling towers in the south-west of the park will become a walk-in light and sound sculpture.

Valdocco

In Valdocco, the Fiat steel works extended over the entire site as well as across the river. A concrete slab covering three-quarters of this section of the park is all that remained. The solid slab will be removed above the Dora, but the river kept in its concrete bed. Water rises out of darkness into the light of day and flows through the pierced wall, like through a wild gorge. The opened up water course is flanked by walled-in promenades. On the terraces, which have been constructed with excavation material on both sides of the river, hundreds of trees are reminiscent of the grid of the former buildings. Their canopies provide shady spaces for diverse activities, and the tranquil setting creates the perfect backdrop for the "technical ravine" of the freed water course. Walkways erected on the old substructure connect the north of Valdocco with the south. The southern section of Valdocco was completed in 2011 and, in line with the Kyoto Protocol, implemented carbon neutrally ("impatto zero").

Figure 22: Elevated Walkway Crossing Industrial heritage site.
Source: guidatorino.com

05
Analysis

Theoretical Framework

The methodology for the analysis made in this project follows the principles of Systemic Design and the large-scale flows of energy that cross the territory and the relation between agents of the landscape at multiple scales. Tracing the flows and bundling them is essentially the way Systemic Design Works, a combination of local realities and conditions and regional flows forged together to make the landscape.

Another POV that has been taken into consideration while analyzing the region is the relation between People, Ecology, and Economy and all the related factors that interact with each one of these elements. Interpreting the research and data of the local people reveals the culture and what is considered heritage in the area. During the analyzing part, special attention was given to the environmental aspects and the impact that a wasted landscape could have on its context. Reading the landscape through analytical software and mapping what already exists in the region revealed the opportunities and threats as well as strengths and weaknesses.

The natural environment is a system of different forces, sometimes unpredictable that are dynamically merged together to create a system that has been able to sustain itself for thousands of years. Systemic Design follows the same concept as it considers all the existing forces of the landscape and aims at developing a system that is adaptable as bare soil, flexible as a river, and open as the planet.

The analysis part studies the territory on multiple scales and maps different layers of land in a knowledge-building process rather than a problem-solving one. The aim is to find proactive strategies that embed in the landscape and celebrates the contextual existence of the landscape.

The interpretation of the territorial scale to find the most logical strategy for the reclamation process was a motive to let the landscape reveal itself.

FRAMEWORK

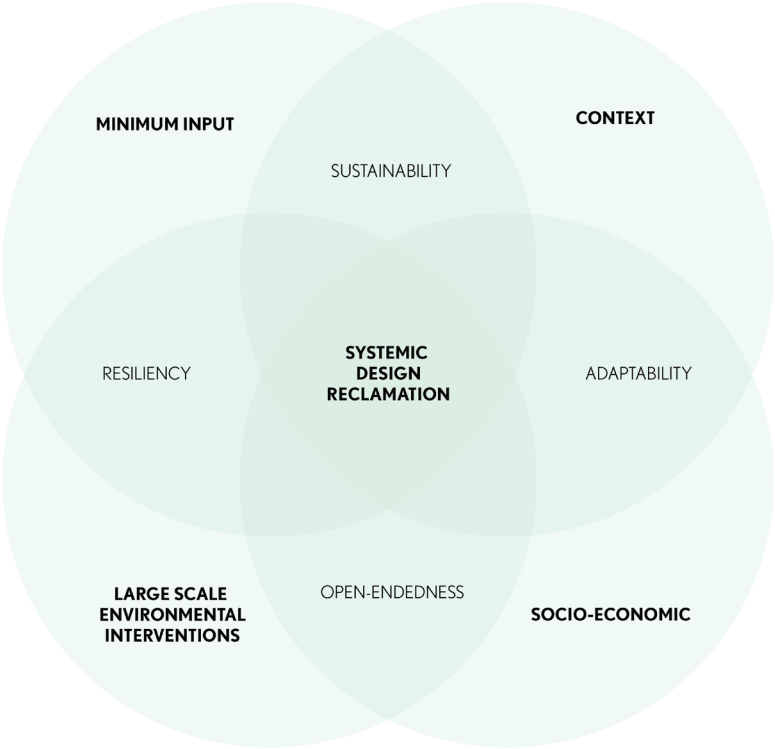


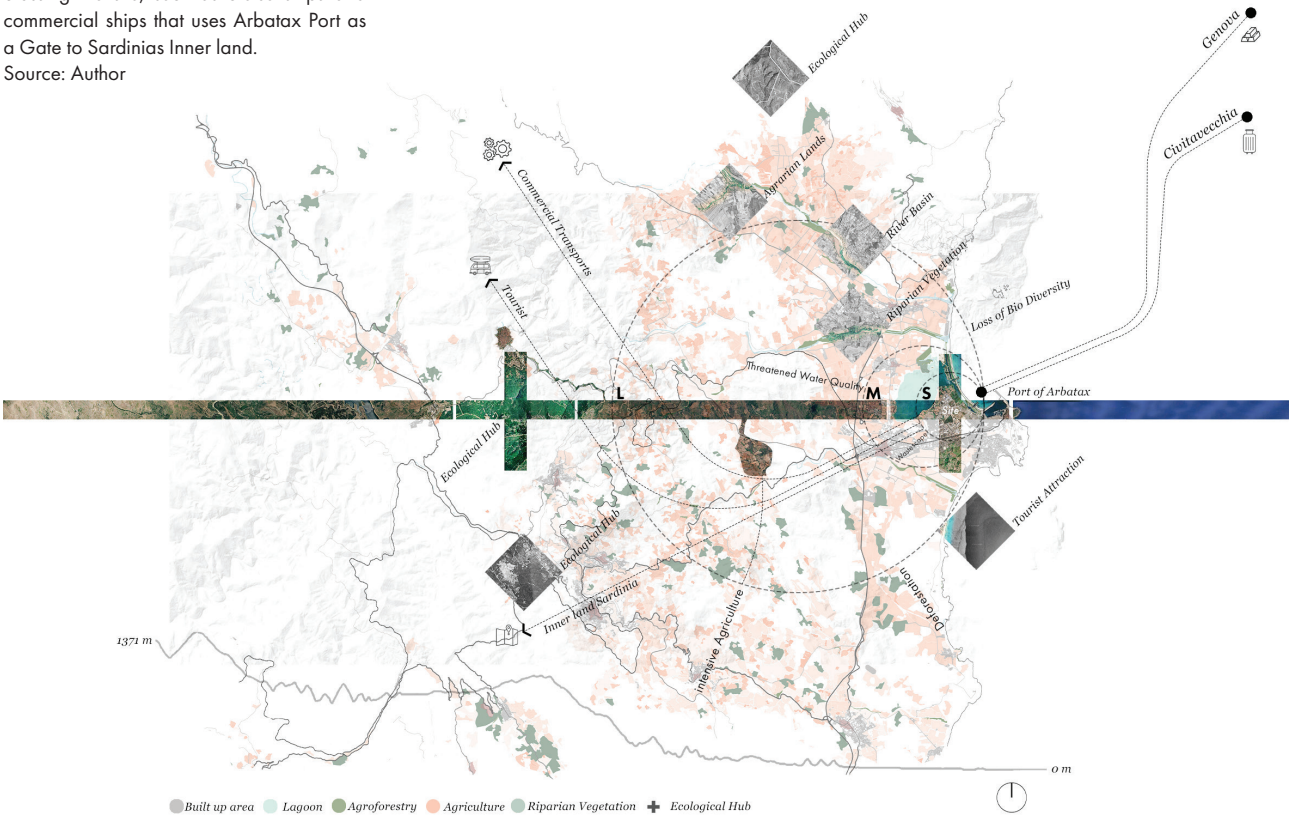
Figure 23: Systemic Design Framework - Diagram showing the fundumentals of Systemic Design
Source: Author

Territorial Scale

Ecological Analysis

The ecological system when being observed along with the economical assets of the landscape such as agrarian lands shows a scattered connection between ecological hubs in the region. The map below demonstrates the area of the 3 different scaleof the project and the main element each scale is dealing with. The final goal is to reconnect the 2 ecological hubs disconnected by agrarian lands. The map also shows how the arbatax port works as a gate for innerland Sardinia for commercial and touristic purposes.

Figure 24: Map Illustrating the scales that project will envolve in and different flows crossing the site, such as cruise ships and commercial ships that uses Arbatax Port as a Gate to Sardinias Inner land.
Source: Author



The history of the landscape in Sardinia has always been strongly correlated with human civilization dominating the island. Colonized since pre-historical times (13,500 years BP according to, the island has undergone a transformation from a landscape dominated by closed primary forests to a mosaic of agro-silvopastoral patches. The Mediterranean basin, one of the four most significantly altered hotspots on Earth, has been intensively used and transformed by human activities for at least the last 15,000 years, significantly longer than any other hotspot; As a result, only 4.7% of its primary vegetation remains, and the existing protected areas are often threatened by intensive human activities. The map below shows the existing vegetation typology of the territory. The large green system on the west is weakly connected to the fauna interest area

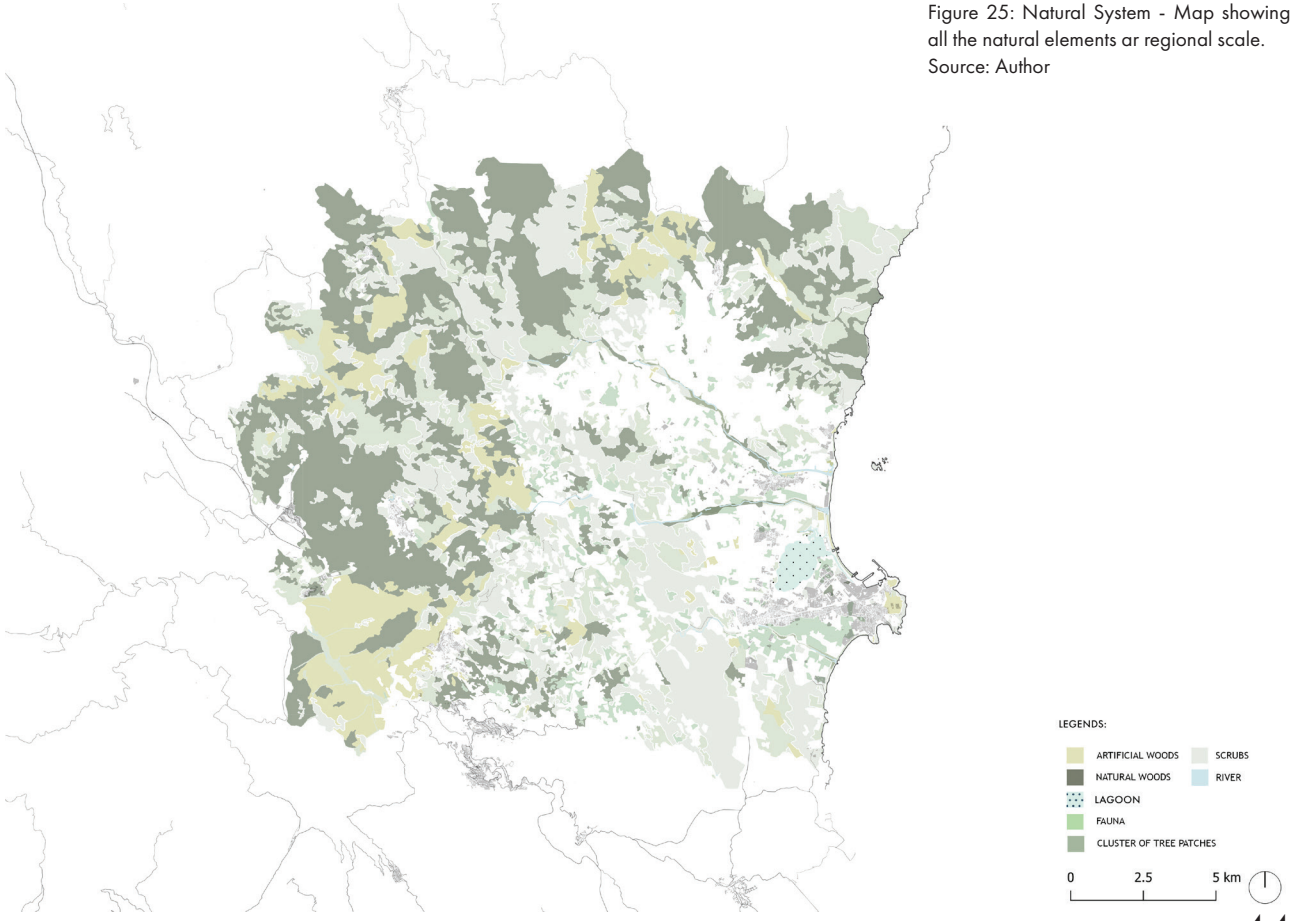
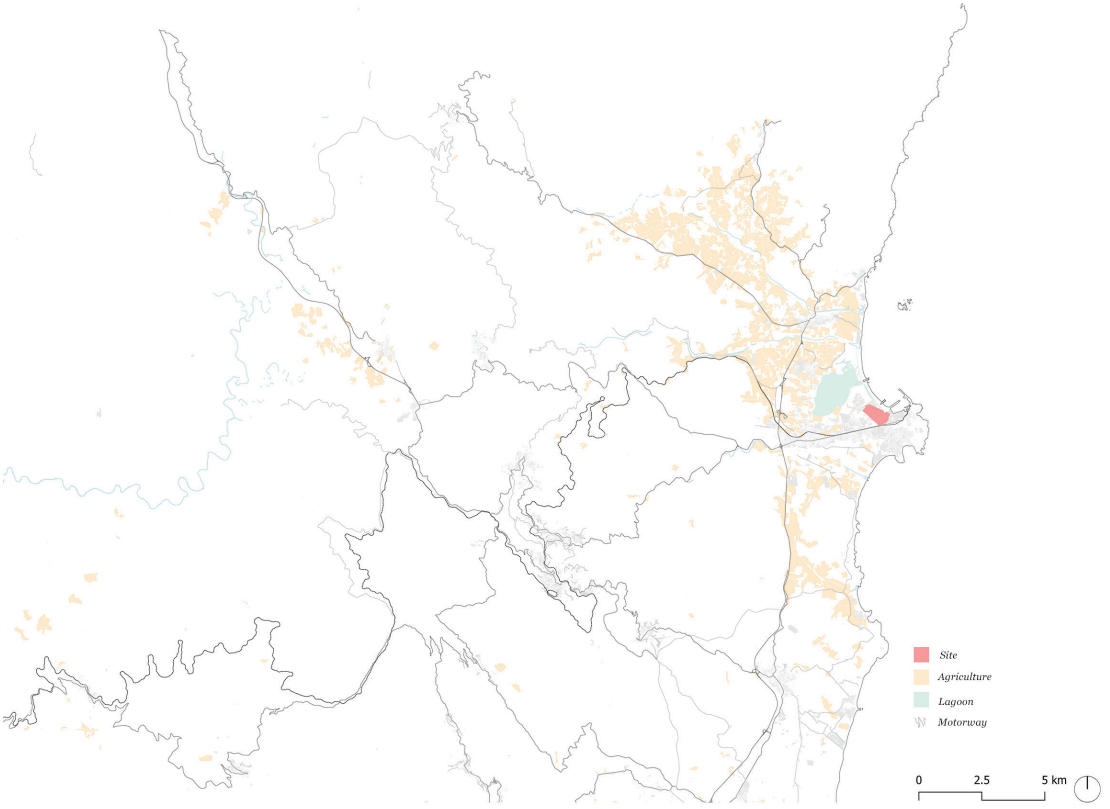


Figure 25: Natural System - Map showing all the natural elements ar regional scale. Source: Author

of the site. This connection is through riparian areas around the rivers which is patchy and disrupted in many areas with distances more than 300m.

The Map below demonstrates the agricultural lands of the Ogliestra plain which have caused a disconnectivity between ecological hubs.

Figure 26: Ogliestra Plain agricultural lands - Map showing the agrarian landscape of the valley.
Source:Author



Ecological corridor development Methodology

Ecological corridors are areas or structures that enable the spreading, migration, and exchange of species between core areas and nature development areas inside an ecological network (Jongman and Pungetti 2004). The two primary components of ecological networks are named hubs, or areas of known ecological value, and links, which are the corridors that connect the hubs to each other.

Knowledge of ecological networks can thus be used to support conservation-related land use decisions. Landscape fragmentation (due to infrastructural developments, industrialization, urbanization, and intensive agricultural practices) causes the geographical isolation of the species and reduces the habitat's resilience, thus leading to a process of biodiversity loss. As a consequence, maintaining and restoring landscape connectivity is currently a central concern in ecology and nature conservation, and more generally speaking in territorial planning for achieving sustainable development (Gambino 2004). Since the 1990s, scientific concerns for habitat and ecosystem fragmentation and landscape and ecological connectivity have entered the political arena, as can be seen in the Global Strategy for Biodiversity (1992), the Habitat Directive (1992), the Pan-European Strategy of Biological and Landscape Diversity (1995) and the Biodiversity Strategy of the European Community (1998). The European Directive on Strategic Environmental Assessment (2011/42/EC) has further fostered the incorporation of sound environmental principles and criteria, such as ecological connectivity at strategic levels, for many types of plans and programs, including regional and urban land-use and infrastructural plans. Nevertheless, there is a lack of quantitative methods able to assess ecological connectivity or ecological fragmentation at the regional scale and to efficiently support planning processes and the strategic environmental assessment (Marulli and Mallarach 2005).

In such a context, a specific family of decision support systems (DSS; Burstein and Holsapple 2008), named spatial multicriteria evaluations (Malczewski 1999), which are based on geographic information systems (GIS) and multicriteria analysis (MCA) coupling, have been found to be effective. From the methodological point of view, the present application proposes the integration between GIS and a specific MCA technique named Analytic Network Process (ANP; Saaty 2005), which represents the evolution of the Analytic Hierarchy Process (AHP; Saaty 1980). The ANP was used to identify potential ecological corridors, which ensure continuity between areas with high environmental and ecological value and stepping stones in the Piedmont Region

(Northern Italy). The experimentation was carried out using both the ILWIS 3.3 software1 and the IDRISI 3.2 one,2 since the two packages provide different functions for the standardization of the factor maps. The study thus developed a decision-support model that was based on land-use data and information on significant ecological areas, including important habitats for target species, wetlands, infrastructural impacts, and human pressures in order to identify larger areas of ecological priority and potential ecological linkages. Since the incorporation of the AHP calculation block in the IDRISI 3.2 software package, it has become much easier to apply this technique to solve spatial problems.

Ecological corridors and spatial analysis

The reduction and fragmentation of natural and semi-natural habitats, as an outcome of agricultural intensification, infrastructure networks, and urbanization, has been suggested as the main reason for the current nature conservation crisis (Foley et al. 2005; Gurrutxaga et al. 2010).

Ecological planning is playing an increasingly important role in nature conservation policies and strategies, thus recognizing the necessity to integrate protected areas of an entire territory both ecologically and socio-economically (Bennett 2004; IUCN 1994).

In this context, it is important to develop coherent and functional conservation networks, known as ecological networks. Opdam et al. (2006) define ecological networks as a set of ecosystems of one type, linked with a spatially coherent system through flows of organisms, and interacting with the landscape matrix in which it is embedded. Hence, the ecological network is a multispecies concept, linking ecosystems, whereas the term habitat network as defined by Hobbs (2002) refers to the habitat of a single species.

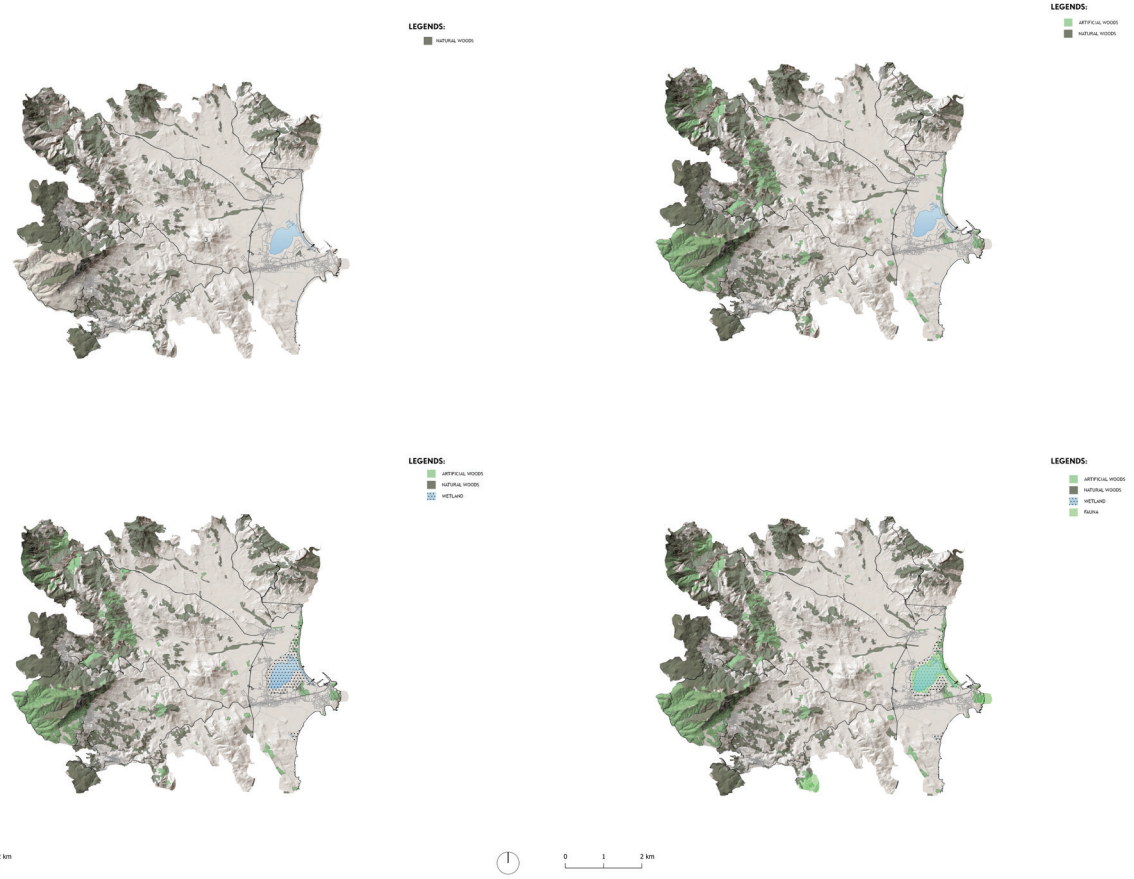
According to Gurrutxaga et al. (2010), ecological networks are characterized by their emphasis on nature conservation at the ecosystem, landscape, or regional level. The focus is on maintaining or strengthening ecological coherence and ensuring the protection of critical areas against the effects of possibly harmful external activities, while at the same time taking into consideration the restoration of degraded ecosystems (Bennett and Wit 2001). One of the main contributions derived from this delimitation of coherent ecological networks is the definition of critical interaction areas between the protected natural territory network and its surrounding matrix of artificial urban land and communication infrastructures. Adequate management of these critical areas is decisive for conservation policies to be effective (Bruinderink et al. 2003). Finally,

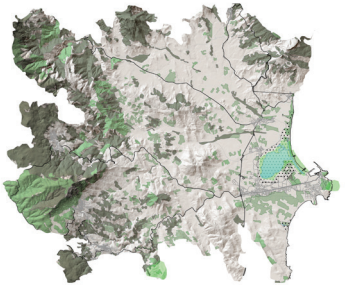
ecological networks typically promote opportunities for sustainable use of natural resources, encouraging complementary facets between land-use objectives and those of nature conservation (Opdam et al. 2006). The complexity of the phenomenon is affected by the multitude of pressures and constraints acting on the ecosystem as well as the need to maintain and develop the links between the ecosystems. At the landscape scale, patches are spatially structured, and they interact with each other and with their environment. As a consequence, a spatial approach is necessary (Vogt et al. 2007). Geographic information systems (GIS)-based models are widely used tools for the design of ecological corridors, and least-cost modeling stands out as an efficient technique because of the explicit results it yields and because it allows for parameterization and testing through empirical studies (Noss and Daly 2006; Theobald 2006). The spatial design of ecological networks has led to their implementation in landscape planning (Huber et al. 2007; Opdam et al. 2006) and in turn, has had an effect on land-use policy and the evaluation processes for the environmental impact assessment of plans and projects.

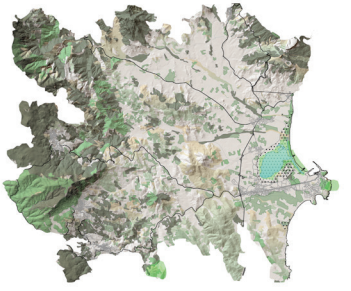
What are the most Suitable Lands for Ogliestra Plain Ecological Corridor?

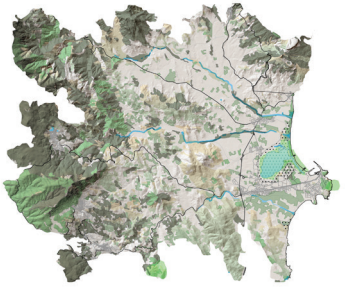
In this analysis, The aim is to study the environmental elements on the large scale in order to improve the large green corridor system. It shows the layers of Artificial woods, Natural wood, Wetland, Fauna, Cluster of tree patches, Scrubs, River, Built area, Riverside veg through the paths for improving the disconnected area in our corridors the projected desire is to reconnect the fauna interest and artificial wood in our project zone to the bigger green system in Sardina. In this analysis, the aim is to improve connectivity between green elements in the large system to enhance biodiversity and to re-connect the green areas. Moreover, the analysis studies the implementation of the green corridors in the areas which have the most ecological value like riverbeds. the thing about riverbeds is that there are many environmental elements that can help us forge a connection between the large green system and the area of the site. this practice will take place by filling the patches with new local trees in the areas that have the least connectivity.

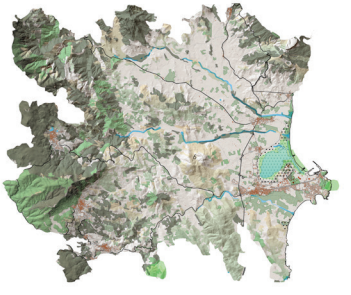
Figure 27-36: Maps showing the development process of the territorial ecological corridor.
Sources: Author



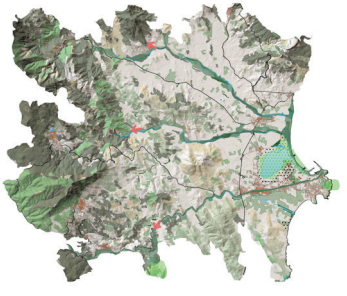








Ecological System



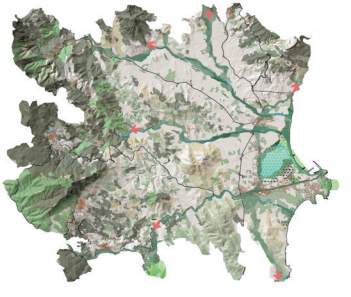
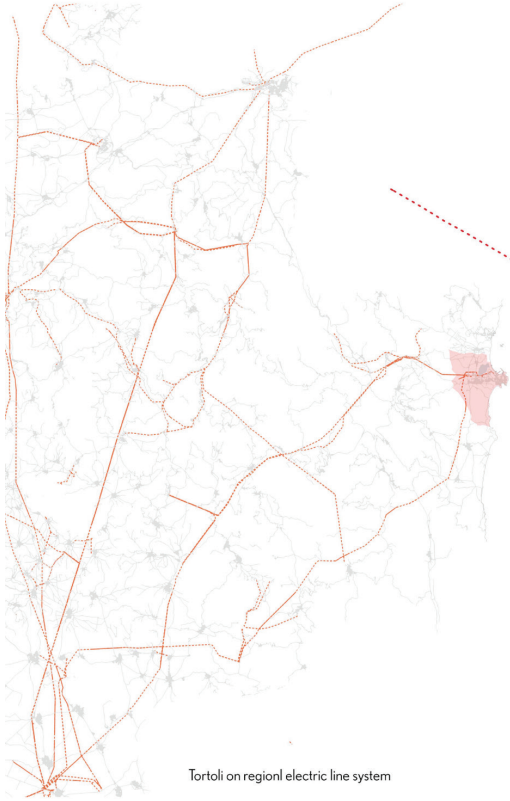


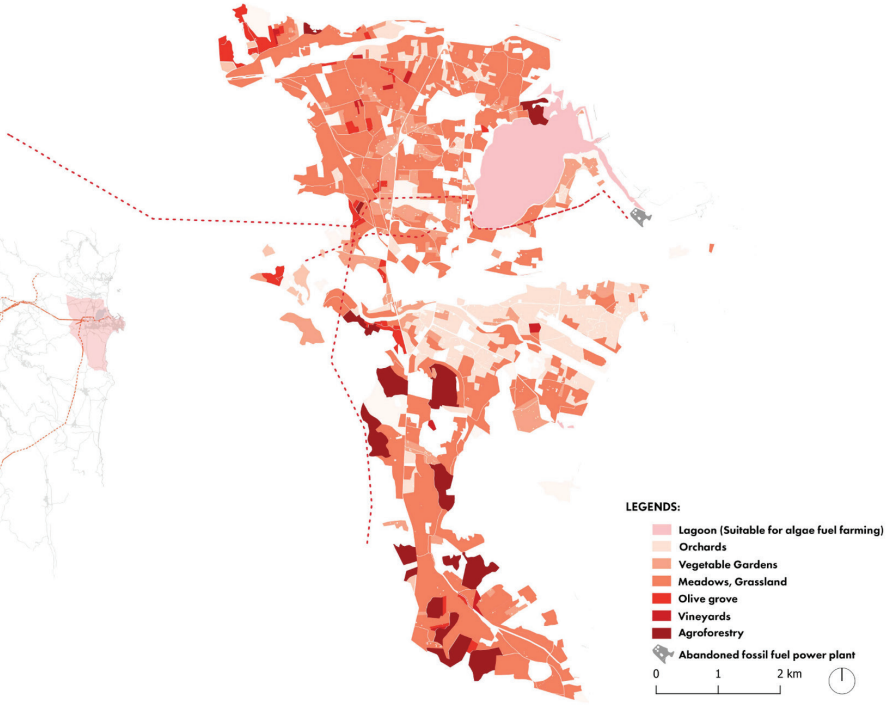
Figure 37: Typologies of Agricultural lands.
Source: Author

Agrarian Lands

The plain of Ogliestra is a highly productive area in the province.



Tortoli on regionl electric line system



Recourses that could produce Biomass and Bio fuel

Where does energy comes from?

Thermoelectric Power plants or cogeneration plants powered by fossil fuels or bioenergy represent as much as 57% of the total electricity produced in Sardinia.

Figure 38: Energy Generators in Sardinia - Map showing the power plants and green energy generators across the region.
Source: Author

Sardinia boasts some of the best wind and solar resources in the country. It had 873MW of solar photovoltaic (PV) capacity at the end of 2019, 1,055MW of onshore wind and 466MW of hydroelectric energy, with 42.1% of electricity consumption coming from renewable sources in 2018.

Electrical energy balance in sardinia

Europe is to be carbon neutral in 2050

Sardinias proposal to build a 585km gas pipeline

Cost an estimated at €600m

If the pipeline were authorised and construction begun quickly, the project would not be completed before 2025.

What if the investment goes to renewable energy?

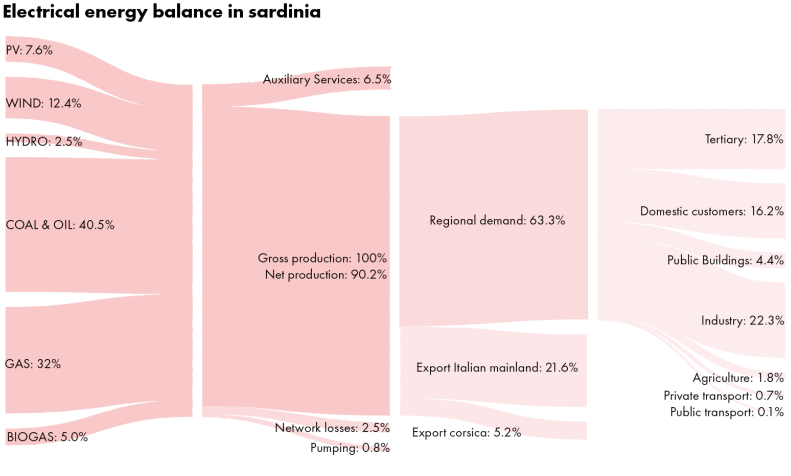


Figure 39: Electrical energy balance in Sardinia.
Source: Author

The electricity consumption of Sardinia is 8,869 GWh (latest available data 2015): almost half for industrial use (45%), about a quarter for both tertiary (27%) and domestic consumption (26%) and the remainder for agricultural consumption (2%). The province of Cagliari accounts for 46% of regional electricity demand, while Sassari with a 15% share is confirmed as the second province out of the 8 in the Region. In 2015, Sardinia produced 11,618 GWh of electricity destined for consumption, recording an energy surplus of more than 30% (balance between energy consumed and energy produced): this means that Sardinia exports a third of its energy (2,749 GWh) to Corsica and the regions of the Italian mainland to meet their demand for electricity.

In Sardinia, all the renewable sources cover 43% of electricity consumption. There are:

- 325 wind plants (1,028 MW of installed power, 11% of the national total). Since 2009, the wind power installed has doubled, from 580 MW to more than 1,000 MW

- 32,912 photovoltaic plants (732 MW of installed power, 4% of the national total). Since 2009, the installed photovoltaic power has grown more than 20-fold, from 30 MW to more than 700 MW

-18 hydroelectric plants

- 48 thermoelectric plants

At the regional level, Sardinia has adopted its own Energy plan, which includes the following main objectives: ensure grid stability and energy security through the strengthening of energy infrastructure, upgrade the energy system to match the requirements of the regional production system, diversify the energy mix to ensure efficient supply, decrease reliance on oil products, ensure compatibility of power production and distribution with environmental protection requirements and harmonize the structure of energy grids. Nevertheless, Solar Energy is one of the most efficient sources of electricity production in Sardinia considering the Mediterranean climate and the presence of long sunny days. Solar energy has the least negative impact on the environment compared to any other energy source. It does not produce greenhouse gases and does not pollute the water. It also requires very little water for its maintenance, unlike nuclear power plants, for example, needing 20 times more water. Solar energy production does not create any noise, which is a major benefit.

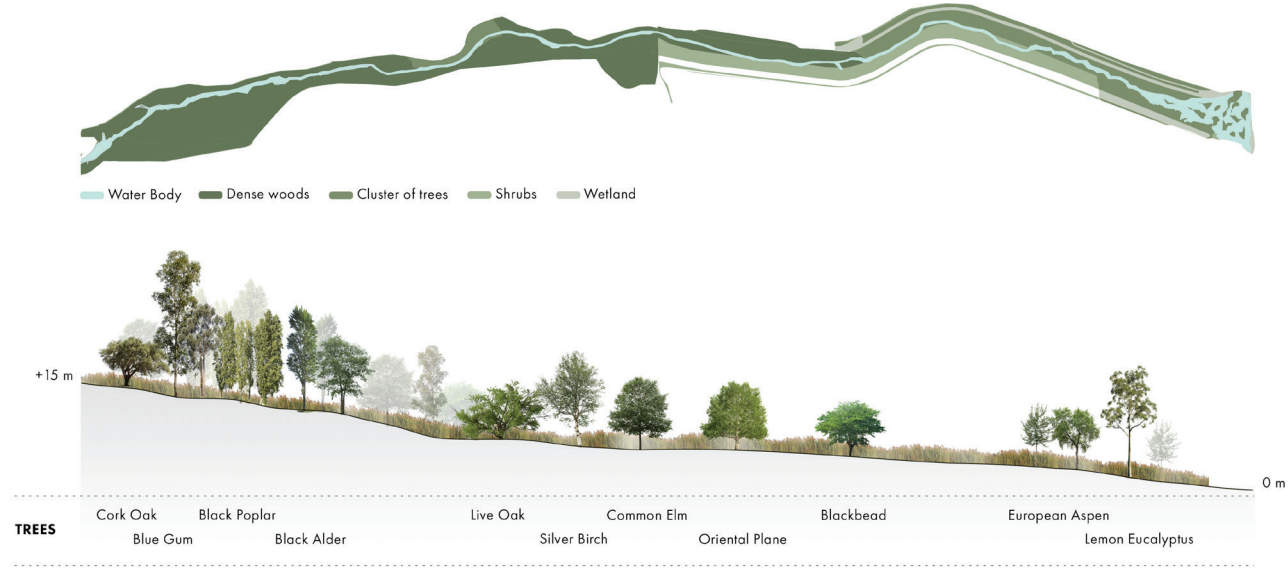
Medium Scale

Ecology

Figure 40: Ecological elements at medium scale.
Source: Author

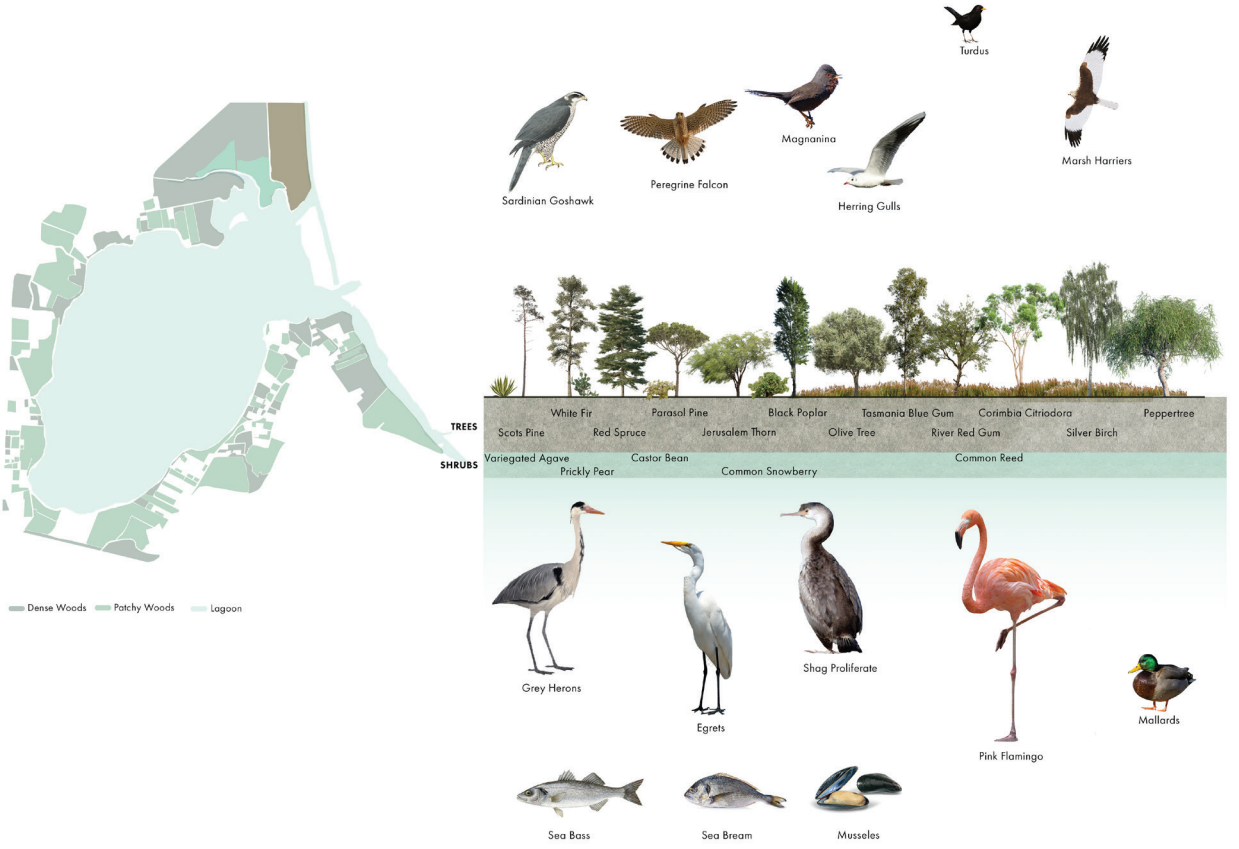
Girasole Corridor Existing vegetation

Figure 41: Girasole Corridor Existing Vegetation.
Source: Author



Tortoli Lagoon Biome

Figure 42: The Biome of the Tortoli Lagoon.
Source:Author



Economy, Resources

S.W.O.T Analysis

STRENGHTHS:

Direct connection to heavy viechle roads and strong motorway flows.
Direct connection to railway.

WEAKNESSES:

Major amount of abandoned properties.
Lack of biodiversity.
Lack of green elements.

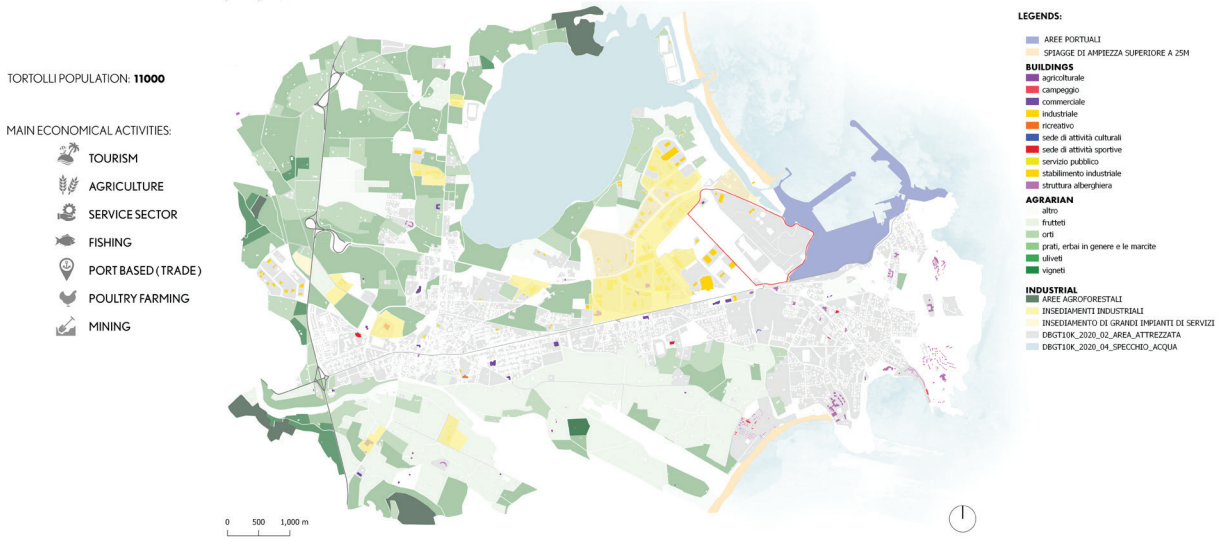
OPPORTUNITIES:

Existing buildings and structures.
Aproximity to the sea and a lagoon.
Macro level envronmental medium.
spectacular economic basis.
Strong sponsorships and reliable stakeholders.
Govermental and industrial support.
access to energy rcource.

THREATS:

Degraded buildings.
Lack of structure enforcements.

Figure 43: The economical drivers of the landscape.
Source: Author



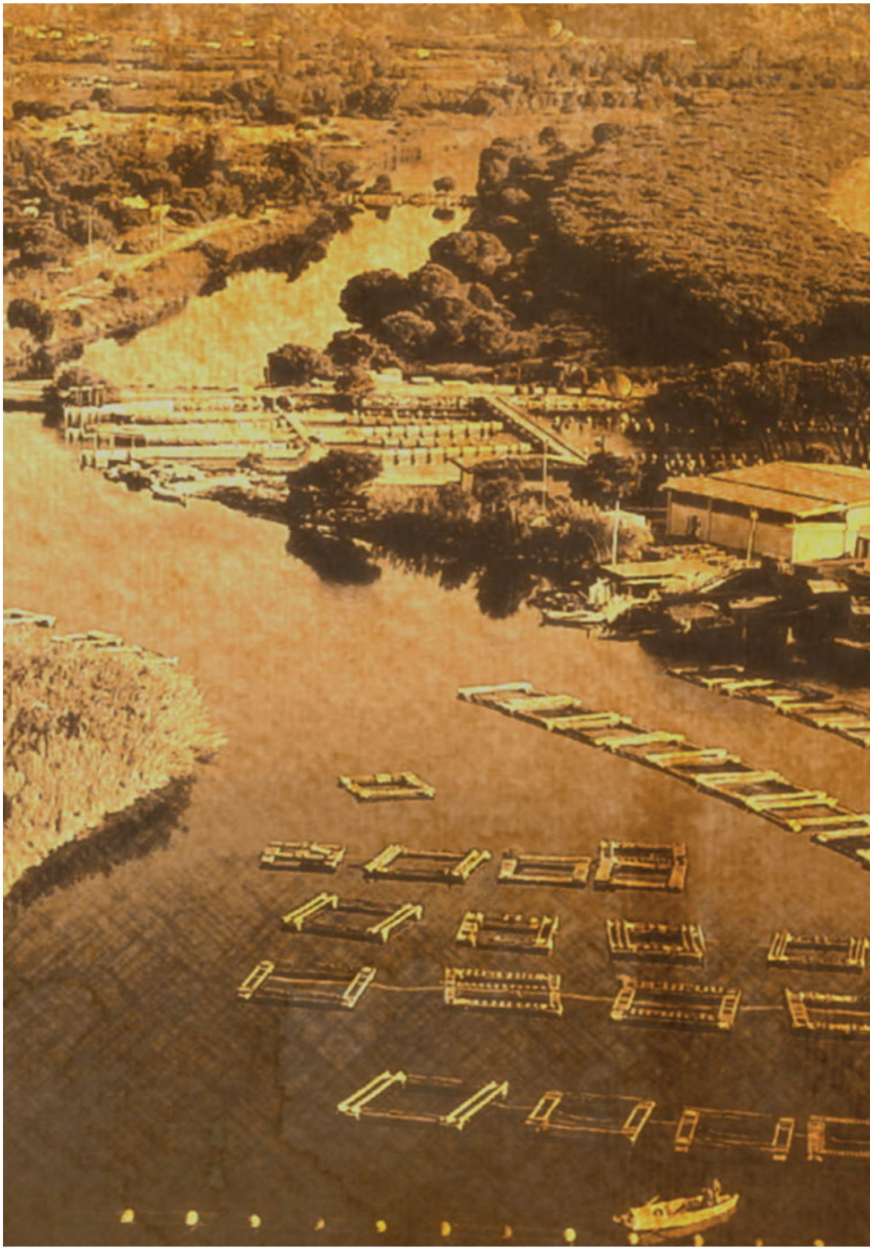
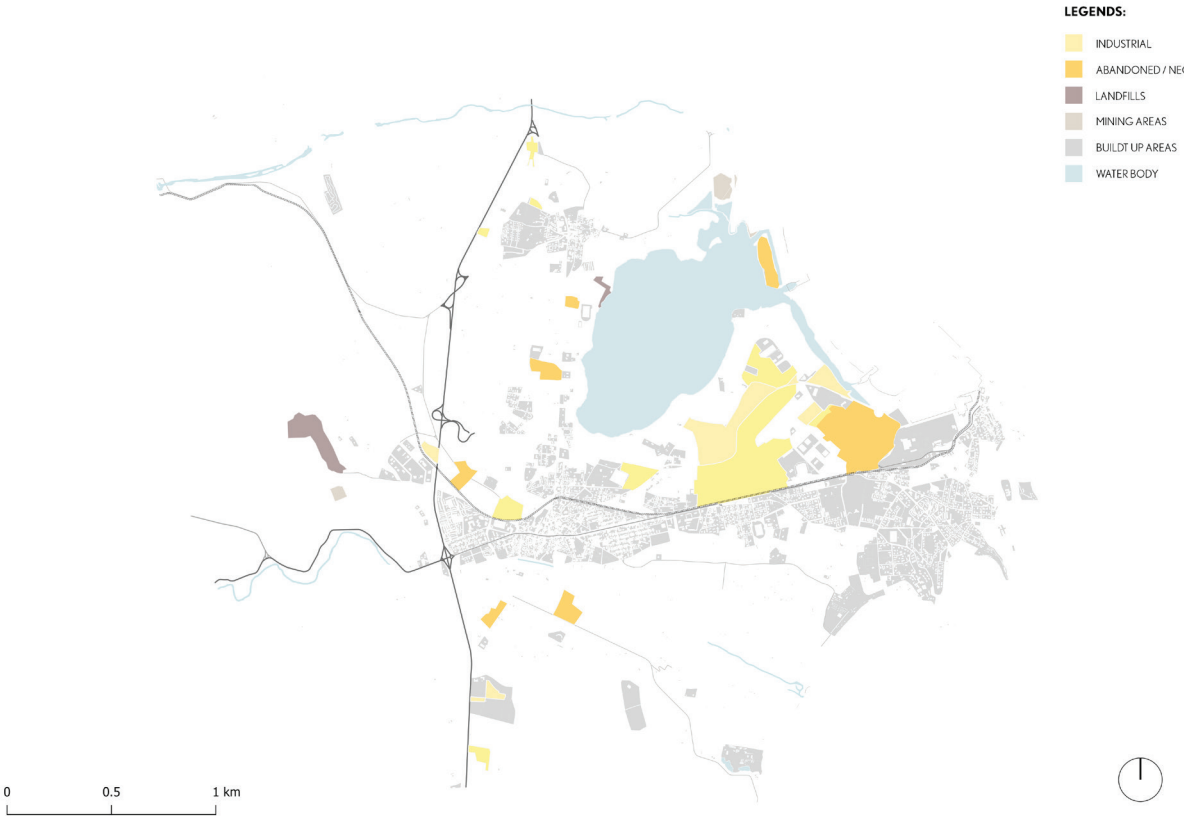


Figure 44: Image showing aquaculture in tortoli lagoon in the past.
Source: pescatortoli.it

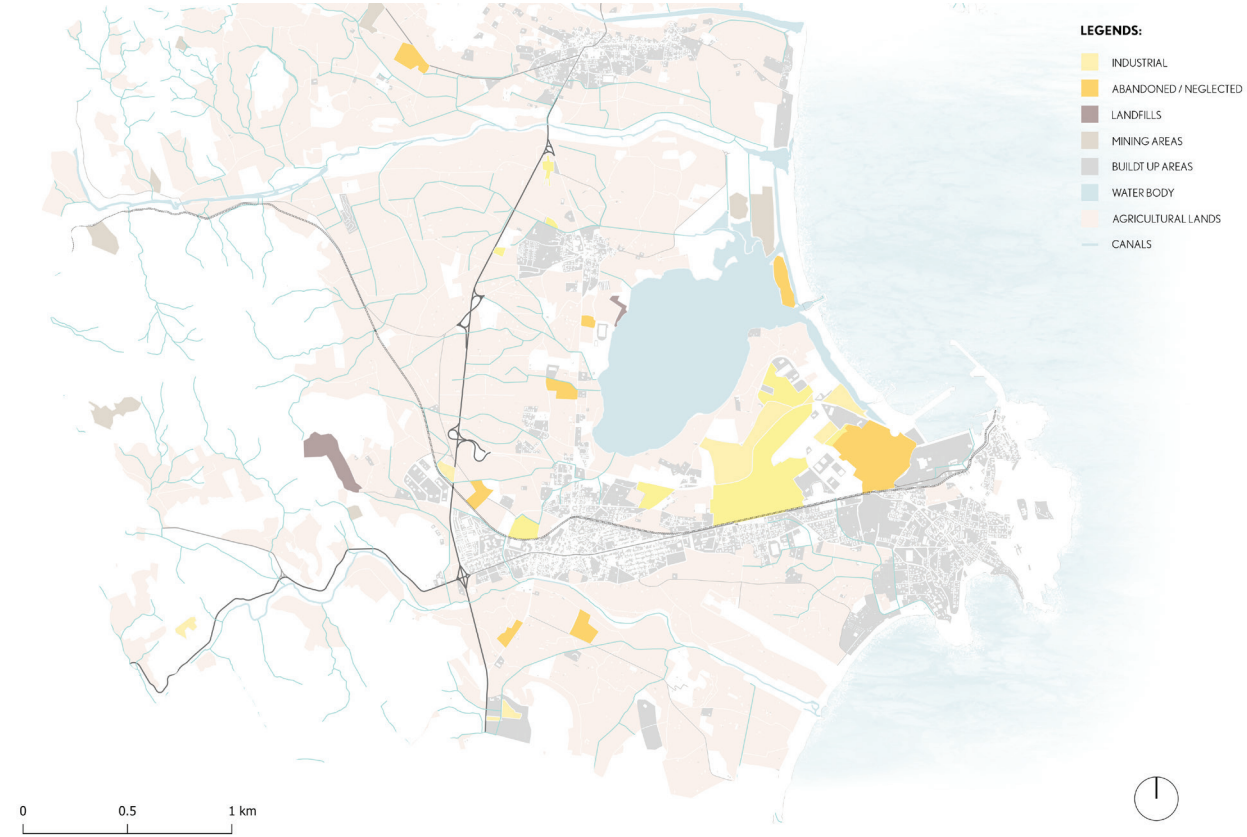
Wastescape determination

Figure 45: Map showing wasted landscapes and industrial areas.
Source: Author



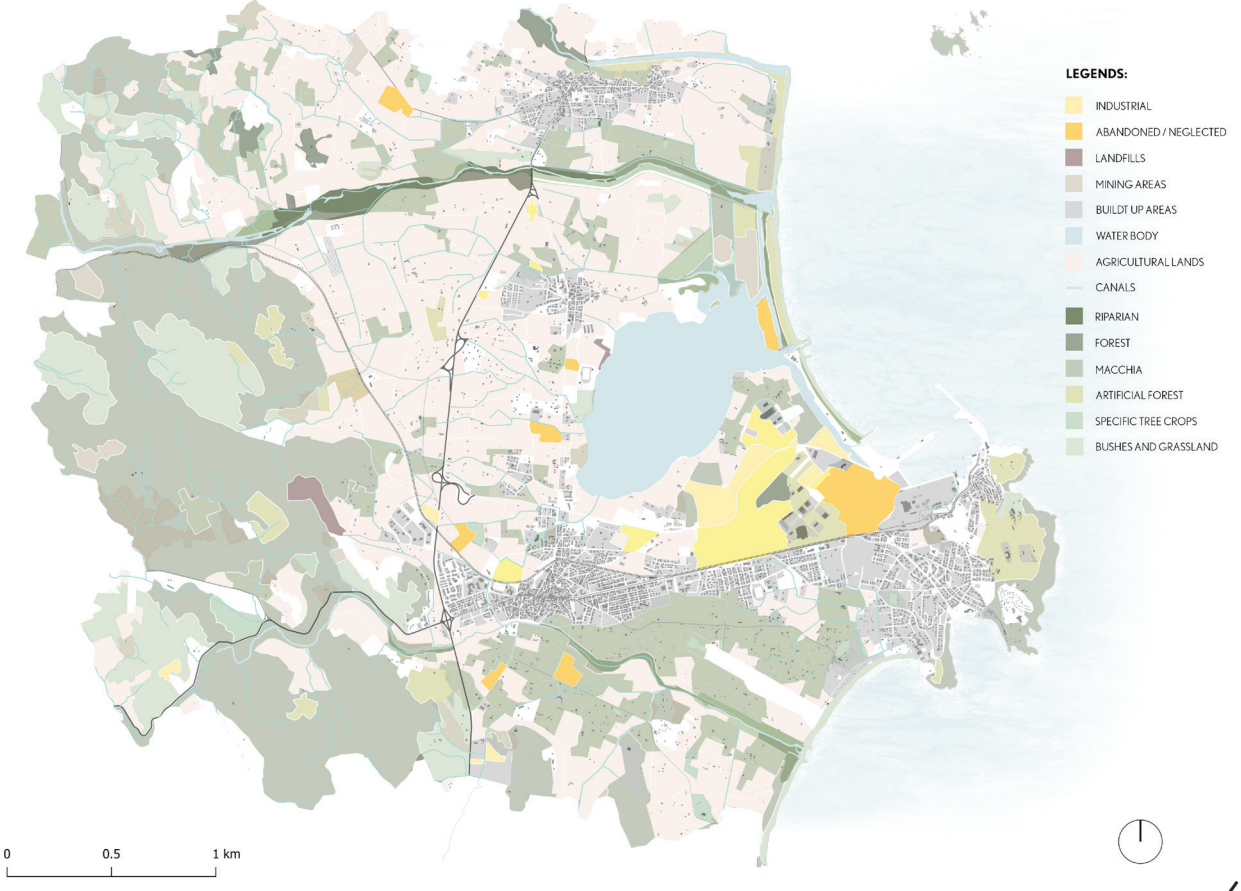
Stresses on the Lagoon

Figure 46: Map showing elements that are a threat to the lagoons biome
Source: Author



The relation of the Wastescapes to the regions landuse

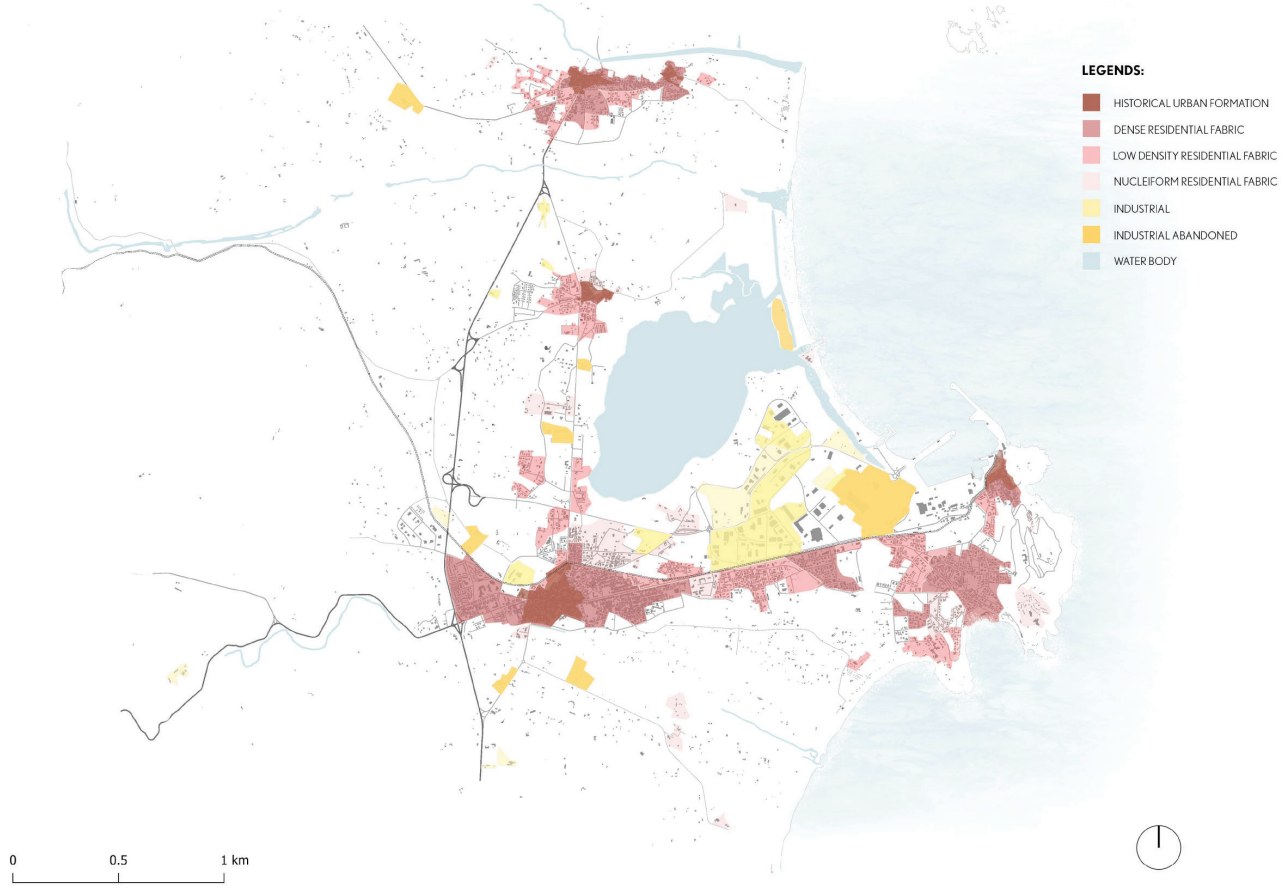
Figure 47: The threats in relation to the riparian area and ecological elements.
Source:Author



History, Heritage

The nearest inhabited centers are Tortolì, which is the capital of the municipality of which the hamlet Arbatax is Girasole and Lotzorai. In Ogliastra the maritime pole of attraction has always been located around Capo Bellavista, and the Port of Ogliastra, known throughout the Middle Ages, is still very active at the end of the 15th century, as shown by the Carrot account books, seems to be identified with Arbatax. The port was used both for traffic with Cagliari (as an alternative to communications by land) and for exchanges that tended to skip the intermediation of the capital, perhaps, as for the export of cereals, resorting to smuggling. The marina was also used to meet the needs of the timber traffic.

Figure 48: Urban Development of the towns around the lagoon.
Source: Author



Festivals, Red Valley festival

Each year in August Arbatax hosts a rock music festival that attracts people from across the country.

Between the third Sunday of August and the second Sunday of September, the three saints to whom the rural churches are dedicated are celebrated every year: San Lussorio (the third Sunday in August), San Gemiliano (last Sunday in August, or, if this was the third, the first Sunday of September) and San Salvatore, celebrated on the second Sunday of September.

Land Art

In Tortolì an important museum of modern art has been created which has the particularity that the works are placed in open spaces. Works by Mauro Staccioli , Antonio Levolella , Umberto Mariani , Ascanio Renda , Maria Lai and Hidetoshi Nagasawa are exhibited . The Su logu de s'iscultura Museum (in Sardinian, "The place of sculpture") is a museum entirely dedicated to contemporary art, located in Tortolì (NU), in Ogliastra . A particular feature is its division into two completely separate exhibition areas: one inside, used for temporary exhibitions, and the other, the characterizing one, located outdoors, along the streets of the town and in the surrounding area.

Figure 49: Elements that are considered as heritage.
Source: Author

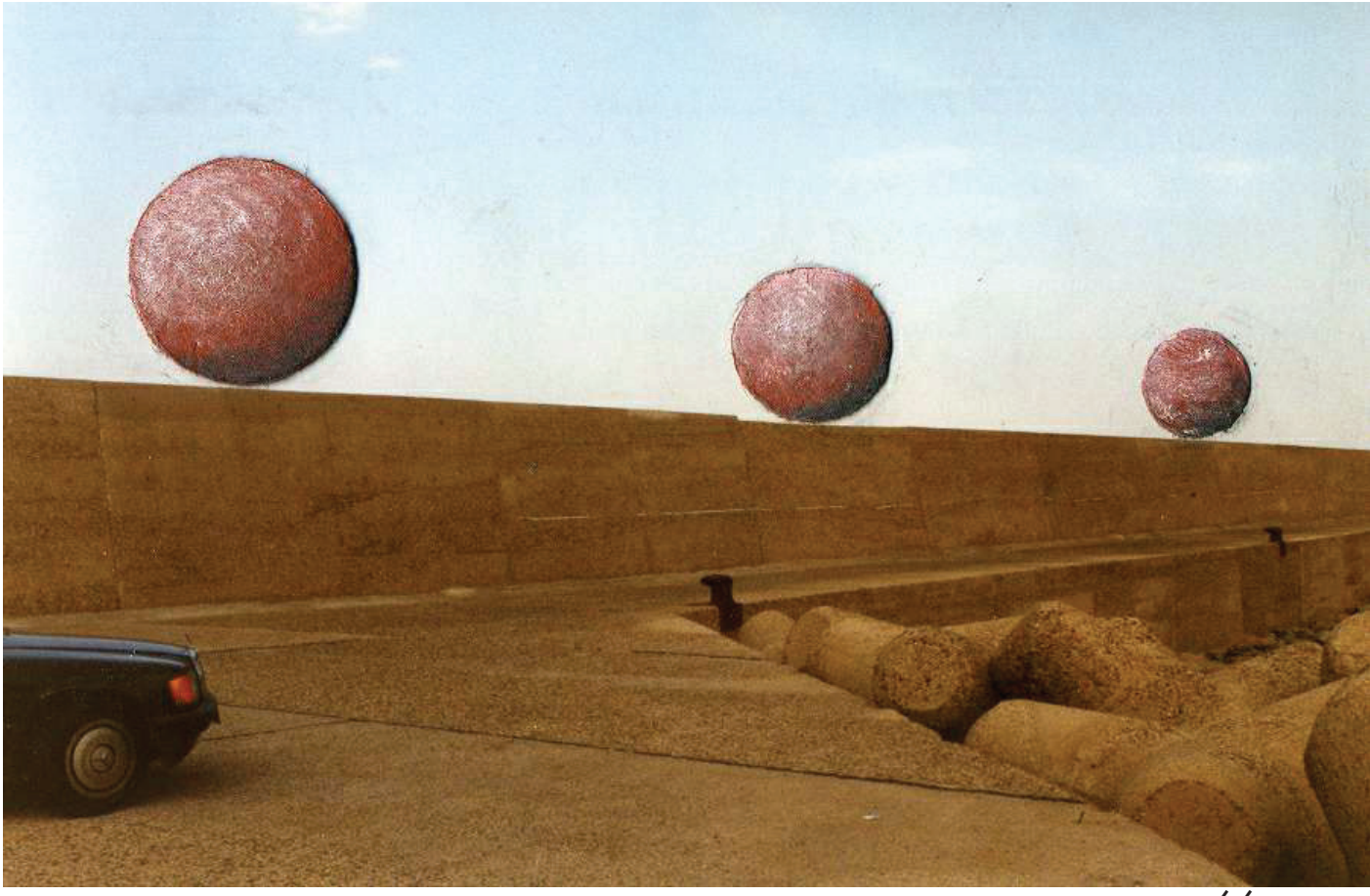
Since the beginning of the 1970s, he has chosen urban environment and, with sculpture, tries to give answers to social questions. His linguistic choice is characterized by the coherence, the essential shapes and by the perfect adherence to the setting where he realize his "sculpture-intervention". He proceeds in a very rigorous way, studying the history and characteristics of the places where he is called to work. With his sculptures he marks the place, transforming the usual perception of the people who come across them. At the end of the 1960s, Staccioli decided to dedicate himself to sculpture. His idea is to meet people where they live which leads him to create sculptures for urban places. His sculptures are "marks", traces of a passage; he wants to affect the people who are usually found in a place and prompt them to experience that place

Figure 50: Mauro Staccioli Observing his own art work.
Source: http://federicobartoliniartolico.blogspot.com/

in a different way. His sculptures always have a strong relationship with the place where he works.

"I wandered around Ozieri for days, crossing the plane stretching out before the city until I discovered a nuragh dating back to 1000 B.C. [...] on the other side [of the road] two almost parallel hills rise up from the ground. The rocky face of the one of the hills has Domus de Janas cut into it, tombs from 2500 B.C. This is an exciting place due to these relics of human endeavour, separated from each other by hundreds of centuries. [...] I created 3 red spheres, measuring 3 metres in size, out of local red stone, the only suitable material for them, and then I positioned them so that they embraced the three existing presences."

Figure 51: Mauro Staccioli ' s painting for Arbatax.
Source: https://maurostaccioli.org/en/tortoli-1995-en/



Cultural Heritage

The archaeological and architectonic heritage of Sardinia offers a lot of unusual traits compared to the other Mediterranean territories. Its peculiarities are concentrated in particular between the late pre-history and the proto-history and have their apex in the Nuragic civilization. However, some other distinctive historicaltime features of Sardinia come from the significant presence of the Phoenician, Punic, Roman and Byzantine civilizations. A new and specific culture arose from the interaction of the local culture with those outer civilizations: its material and immaterial aspects can be easily found and they are fundamental elements of the nowadays Sardinian identity heritage. The essential aspects of the Sardinian archaeology and architecture are well known, even if in a partial way, thanks to those excellent examples of the Nuragic complex of Barumini or the Romanesque church of Saccargia, which are already part of a common heritage.

Figure 52: Nuraghe.
Source: sardegnaturismo.it

Mediterranean Vegetation

Figure 52: Mediterranean Vegetation.
Source: easyvoyage.co.uk

06
Concept

Weaving the Landscape

The concept of the project is inspired by Systemic Thinking and the movement of the flows in regional territories. Each flow of energy bouncing between the local site and region will be traced and bundled with other flows in a symbiotic relationship. This concept will create a feedback loop that the positive impact would be seen on both scales.

As a metaphor, the Sardinian carpet has been chosen to show how strings of energy that would be the Warp and Waft in the carpet bundle together in order to create a desirable final product. Strings that were meaningless individually, now are useful and functional when bundled together.

Flows

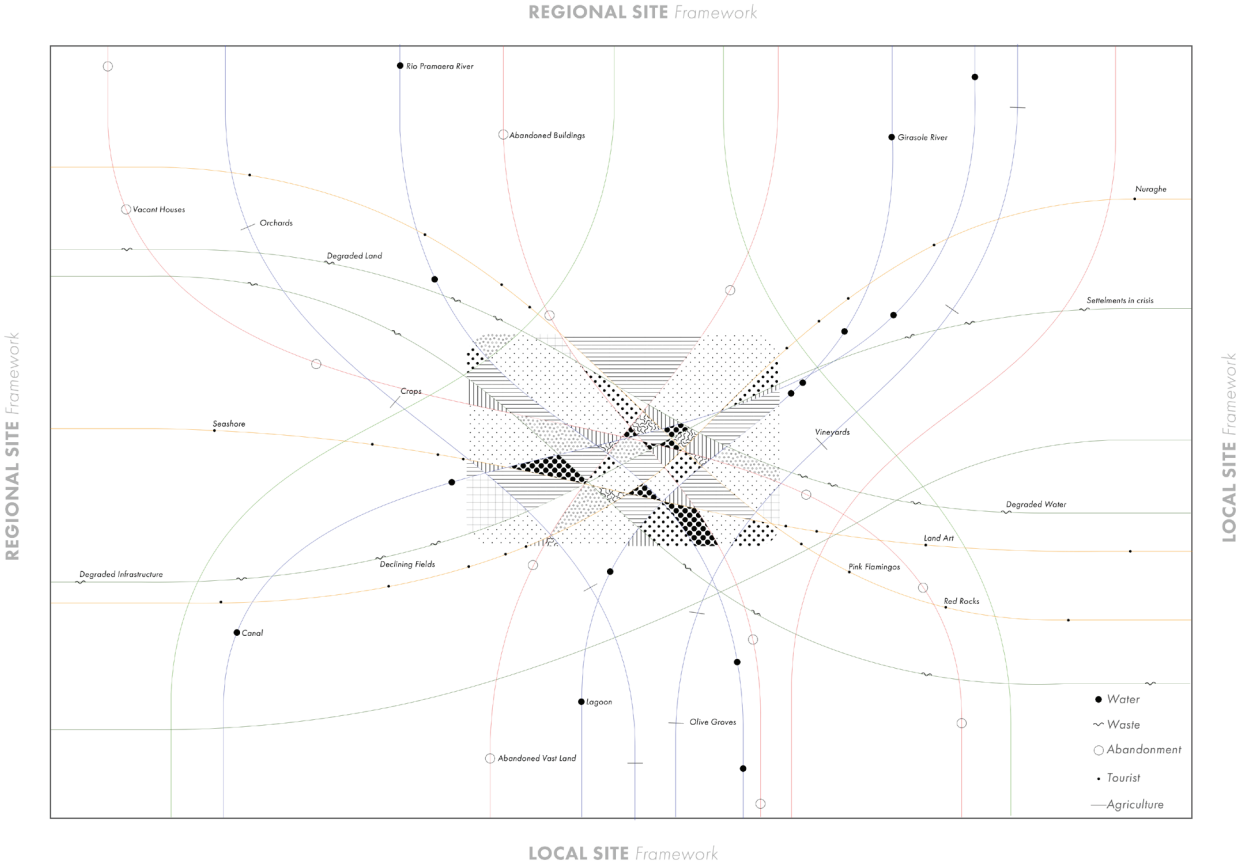
Product

Figure 53: Sardinian Rug Concept.
Source: Collage by Author

The Flow chart

This diagram shows what flows between the region and the local site to form a new functionality for the site. The Sardinian carpets are taken as a metaphor to demonstrate how a design could give meaning and use to an individually useless element. The design aims at bundling the flows that are crossing the site and using them in a new system.

Figure 54: Flow chart
Source: Author



Site readings and initial hypothesis

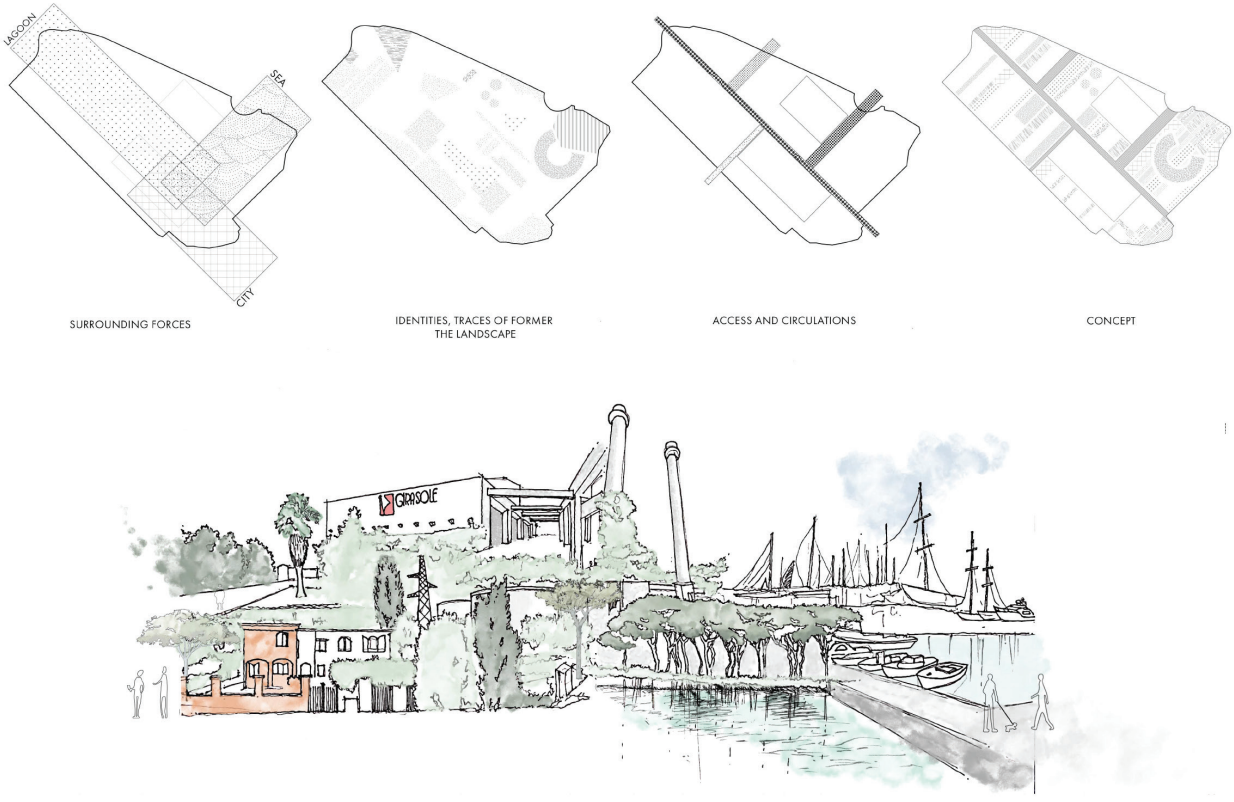


Figure 55: Concept development.
Source: Author

Concept

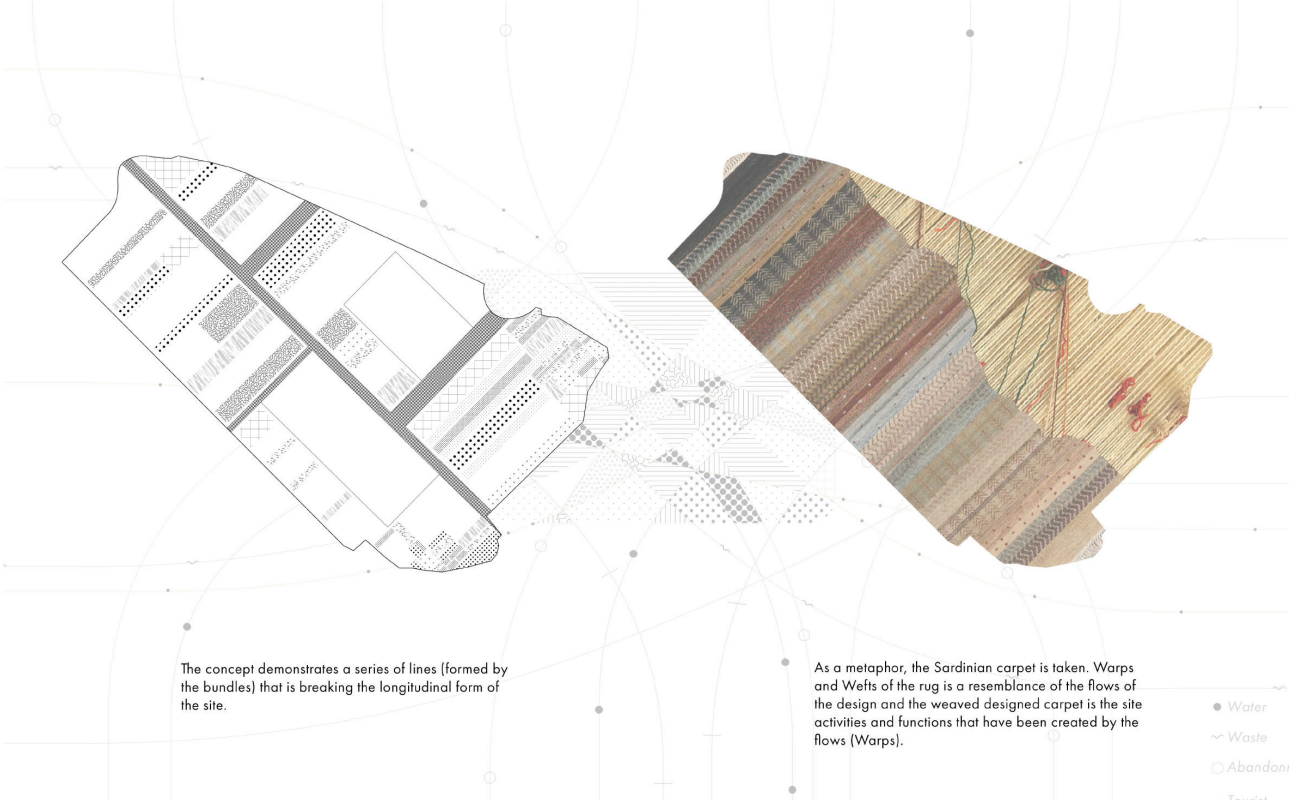


Figure 56: Concept.
Source: Author

06
Strategy

Restrictions and beneficiaries of sustainable reclamation

For creation a successful and sustainable reclamation design it is important to understand how *"landscape ecology and design can invent alternative forms of relationships between people, place and cosmos so that landscape architectural projects become more about invention and programs than the merely corrective measures of restoration"* (Loures, L. and others, 2006) Even in derelict and degraded areas can be created with a new spirit and can be made worth living by keeping visible the spirit of existing site, by applying design strategies that contribute to economic prosperity, social cohesion and environmental quality (Loures, L. and others, 2006).

Therefor the following fundaments should be integrated in Sustainable reclamation design:
1. Perform well the functions for which they are redesigned;
2. Be long lasting and adaptable to new uses;
3. Respond well to their surroundings and enhance their context;
4. Have a visual coherence and create 'delight' for users and passers-by;
5. Be sustainable - nonpolluting, energy efficient, easily accessible and have a minimal environmental impact

The design goal is to re-think the relation between The site and the context of the site through a Systemic Design approach. The proposed project will promote the local economy while enhancing the ecological network interrupted by human activities. It will be an ecological renewal for Arbatax Former paper mill, which through a networked response system will reclaim the value of a former productive identity of the site.

Specifically, the design aims to link environmental improvement to economic developments and on a social scale, the project is a programmatic activator of public activities. These objectives would be achieved through strategies in three different scales:

First, at the territorial scale, the project aims at reconnecting the lagoon as a

biodiversity interest area to the larger ecological hub. The connection is now interrupted by agricultural activity. This objective would be achieved through a system of green corridors identified on river basins and riparian woodlands that connect the lagoon near the industrial site to the larger green system.

Secondly, at the medium scale, a resilient green buffer around the lagoon connects the corridor to the site. This green buffer is a place where art and local agriculture plays a key role in social and economical activities while preserving the lagoon buffer from deforestation.

The third is the site of the Paper Mill at the urban scale and the relation of the site to the immediate surroundings such as the Sea, City, and the lagoon. At this scale, the design creates a dialogue between these three agents.

Through principles of Systemic Design, the landscape is transformed into something different, a place sensitive to different transformations, which records the movements and events that cross it.

For the territorial identification of potential participants in the Systemic Design, it is necessary to define a precise spatial methodology of analysis that could be systematically replicable. The flows of matters and energy that cross the territory, allowing the carrying out of the activities of the supply chain, cause not only emissions and waste flow, but they also physically shape the territory. There is, indeed, a strict link between territorial processes and waste escapes determination, which can be considered the spatial result of urban Metabolism together with impacts at the Micro, Meso, and Macro scale. Therefore, the metabolic activities of extraction, production, distribution, and consumption that define the supply chain and the activity of Waste Management, affect resources but simultaneously can generate Land Use Functions and provide environmental, social, and economic services as well.

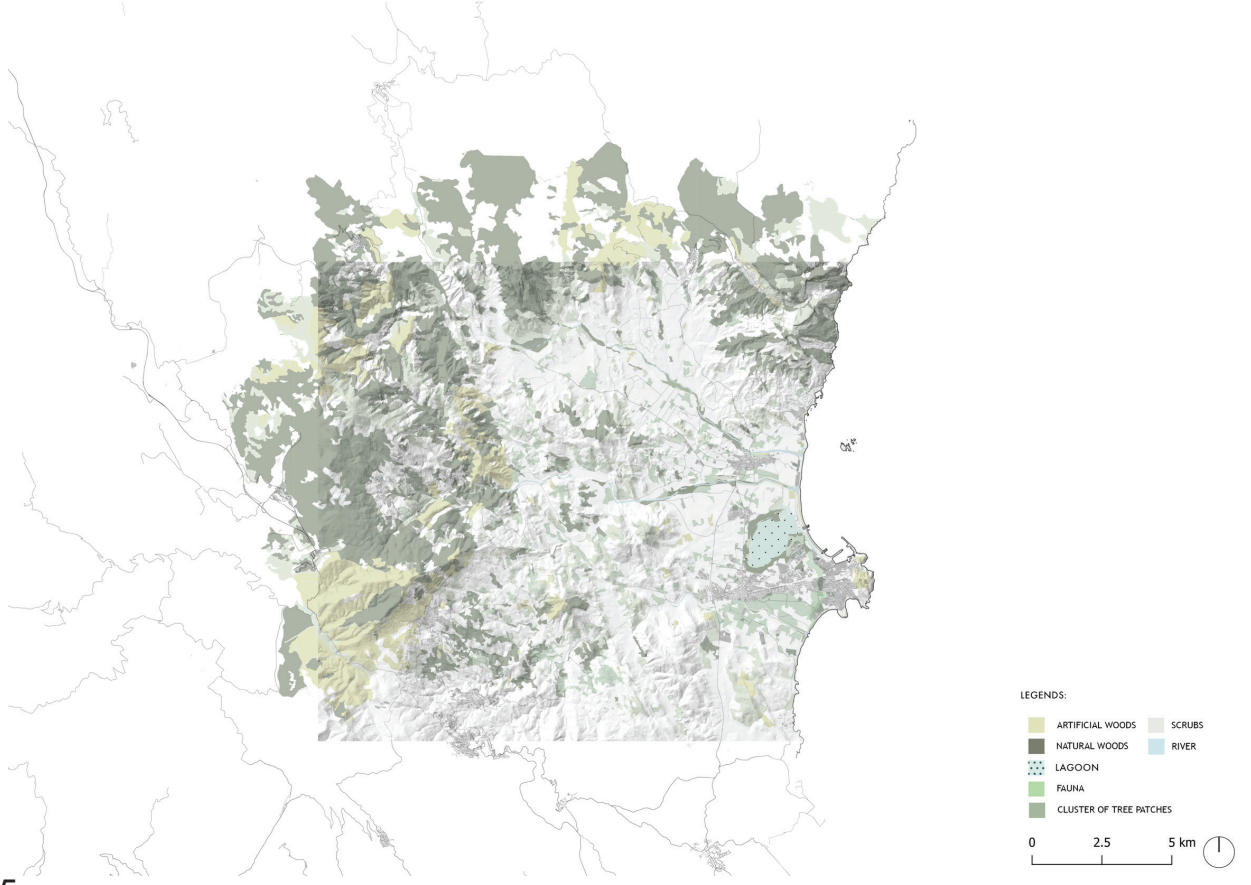
Large Scale Strategy

The strategy is to promote the local economy by using the site as a medium for context-specific economical and productive activities while enhancing the ecological network through forging a resilient green corridor that Integrates Art, Local Agriculture, and a network of pocket parks in between.

Target Areas of the Reconnection

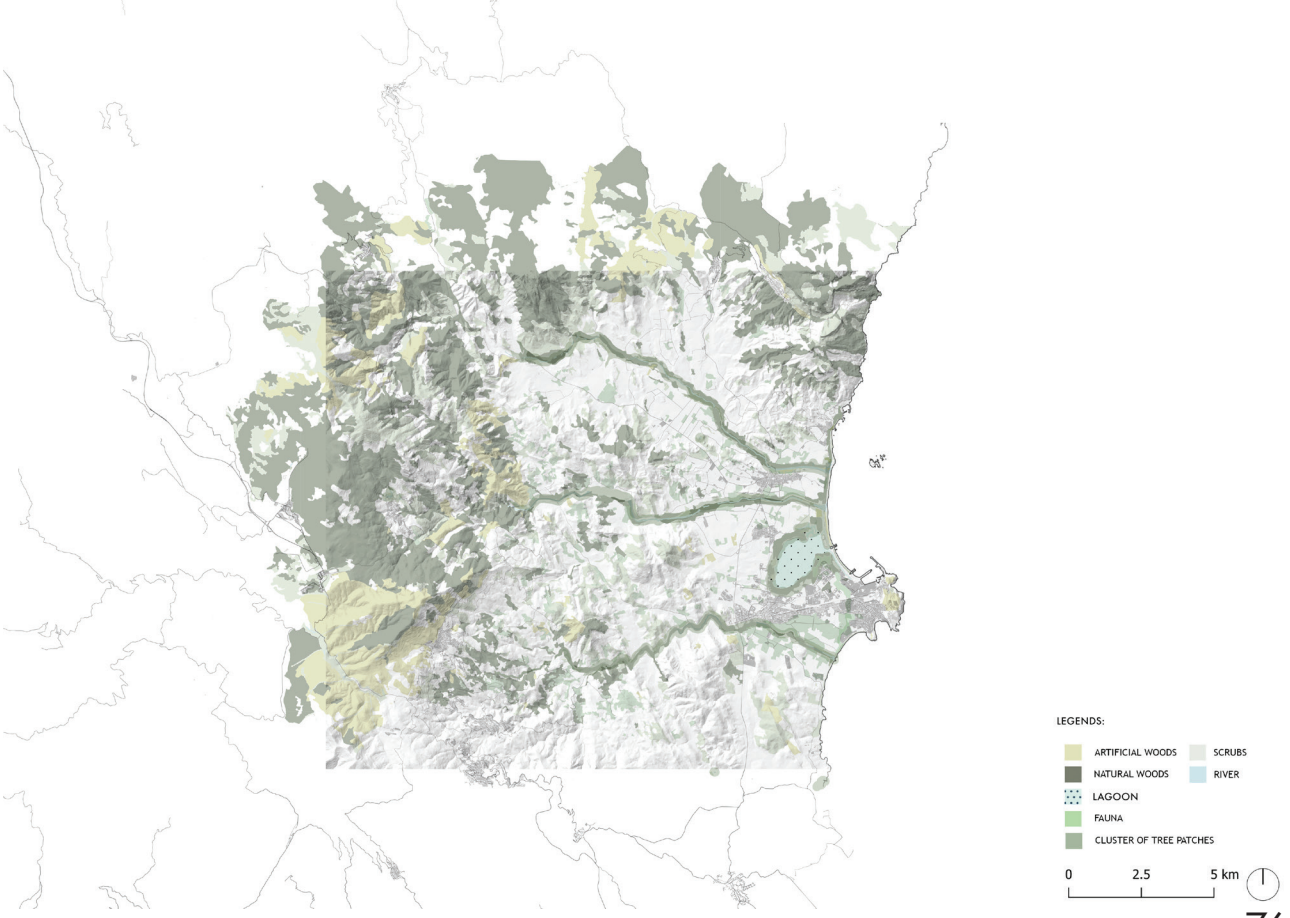
The closest large green system in the territory has been chosen to be reconnected to the site.

Figure 57: Big green system of the regional Scale.
Source: Author



The ecological corridors plan

Figure 58: The Ecological system and the corridors.
Source: Author



The Ecological Corridor Crossing Ogliestra Plain

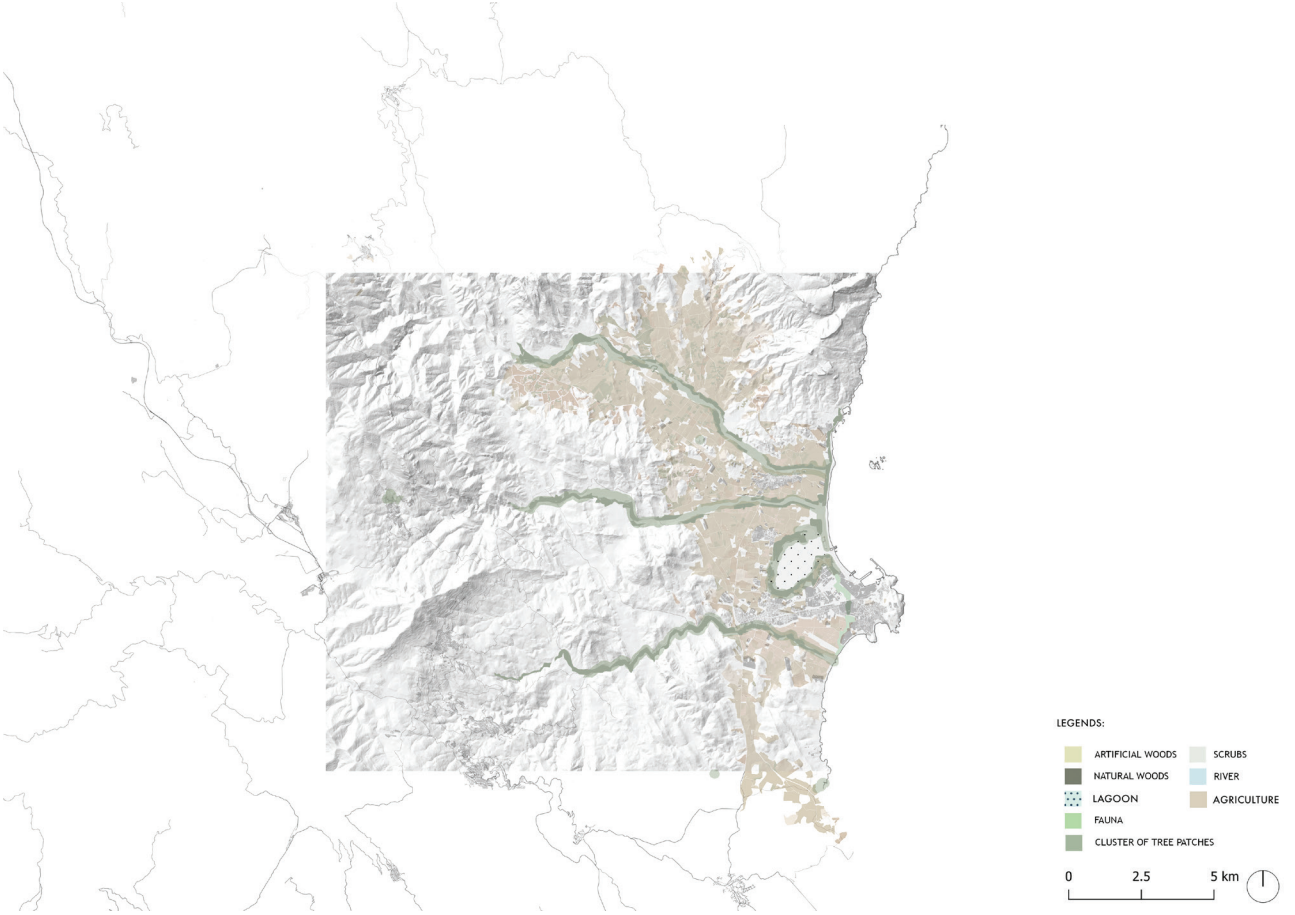


Figure 59: The corridor in relation with agrarian landscape.
Source: Author

Figure 60: Illustration of the corridors and tortoli ' s lagoon and movements of migratory birds.
Source: Author

Forests and parks cleaning and wooden product production

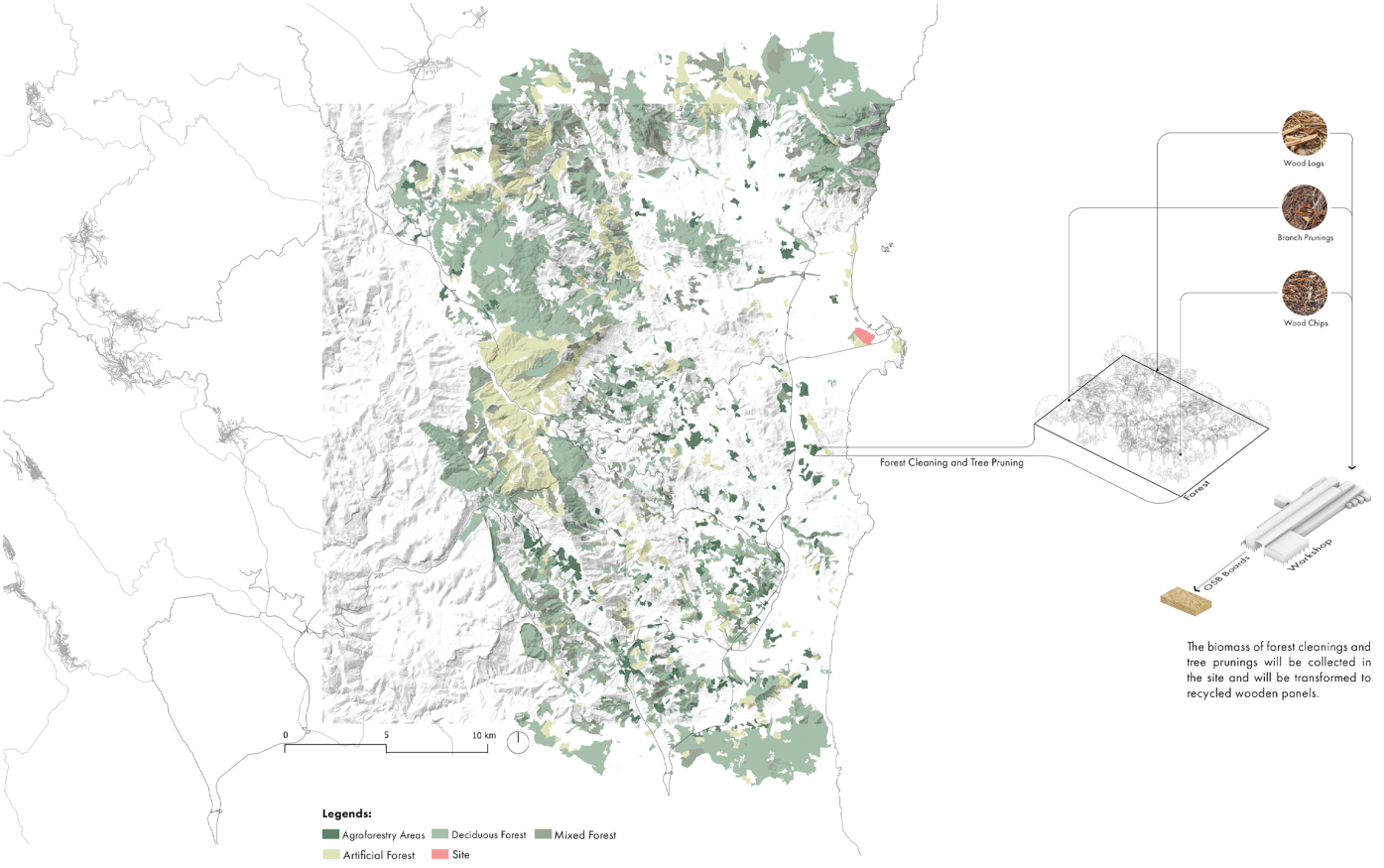


Figure 61: Targeted landuses at the regional scale for the collection of park an forest 's residues.
Source: Author

Agri-Residue Collection System

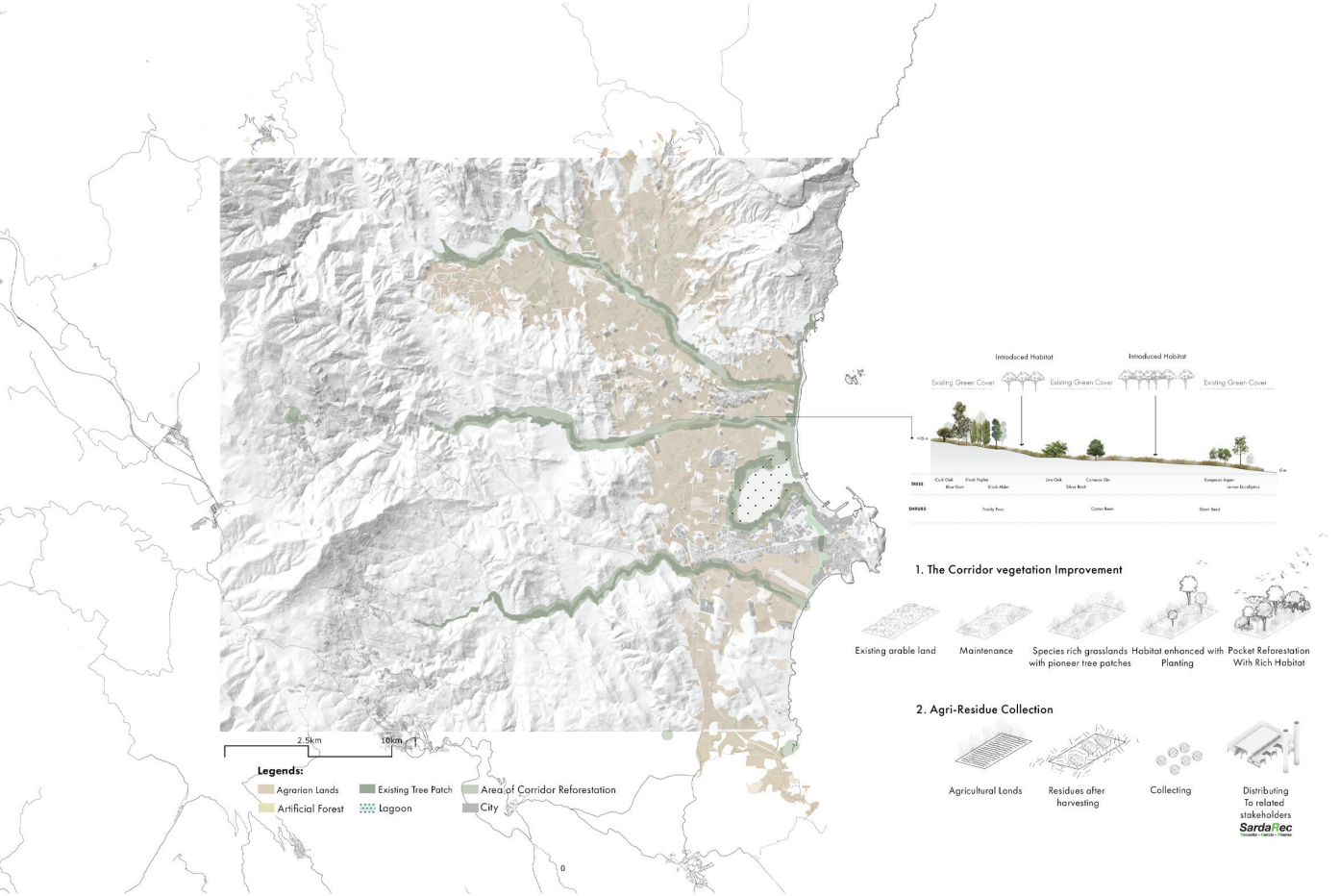


Figure 62: The Vegetation improvement process of the corridors.
Source: Author

Medium Scale

Strategies

Figure 63: Sattelite Image of the local scale.
Source: Author

Value Reclamation

Figure 64: Value reclamation Diagram.
Source: Author

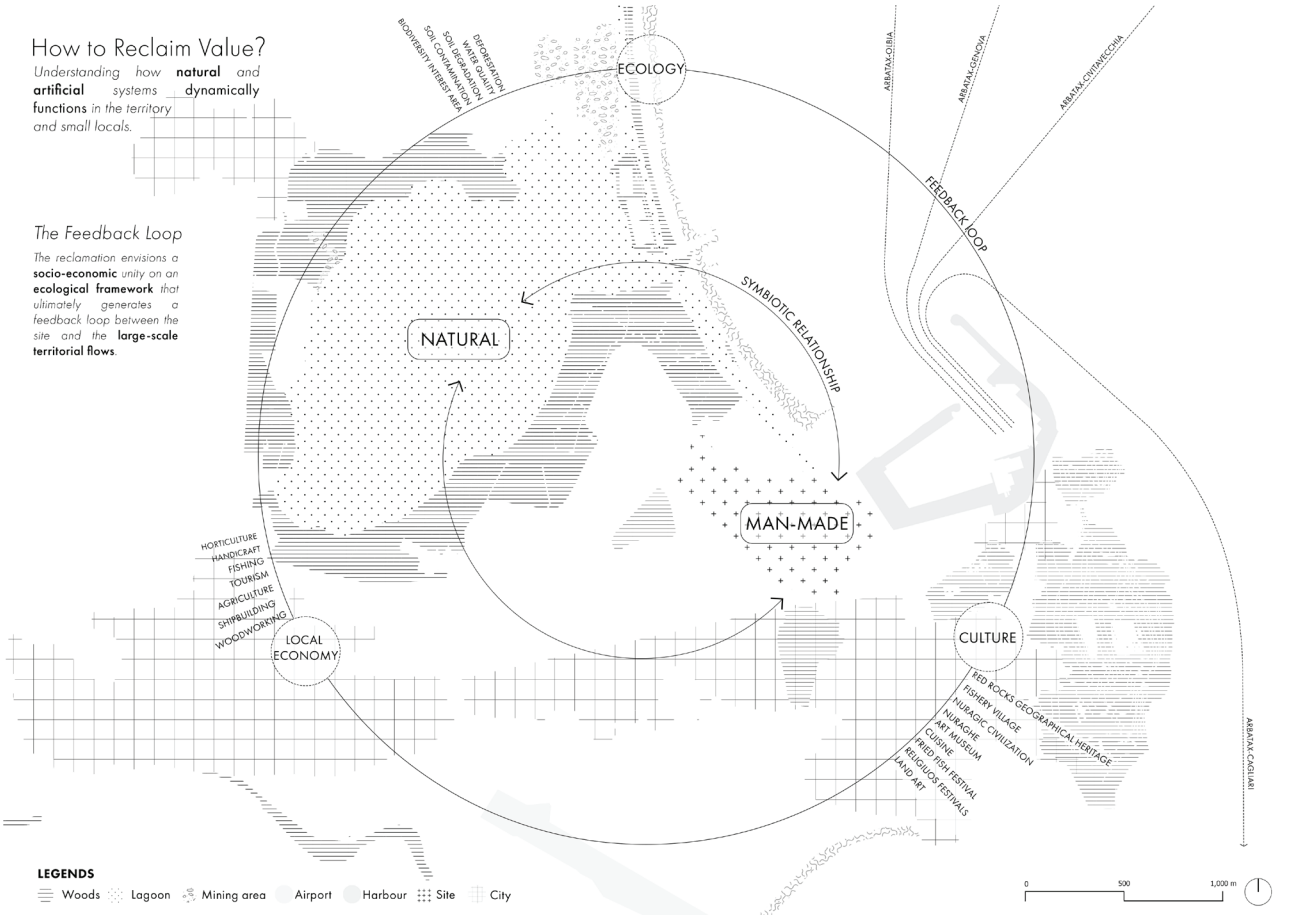
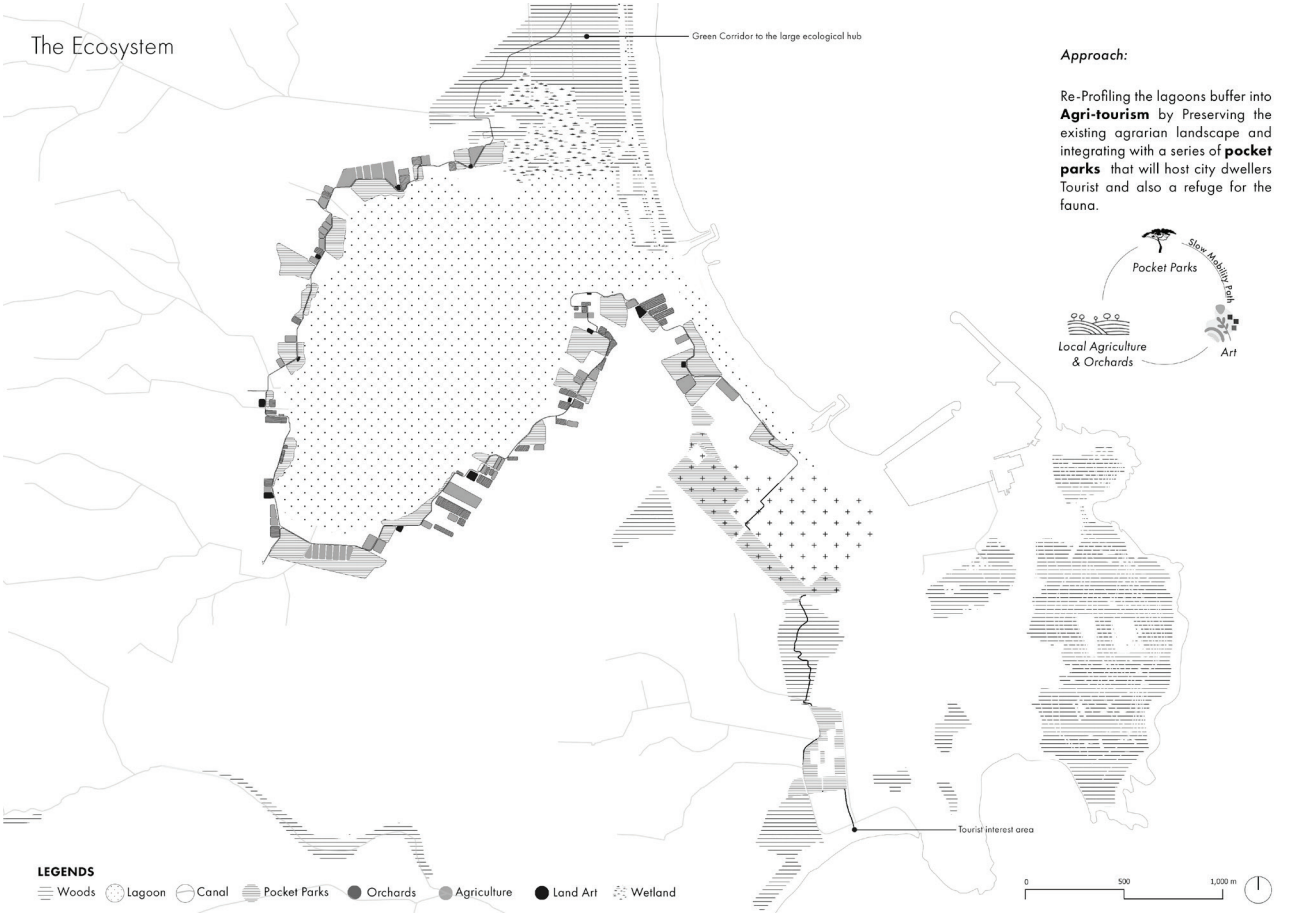


Figure 65: The existing ecosystem elements
Source: Author

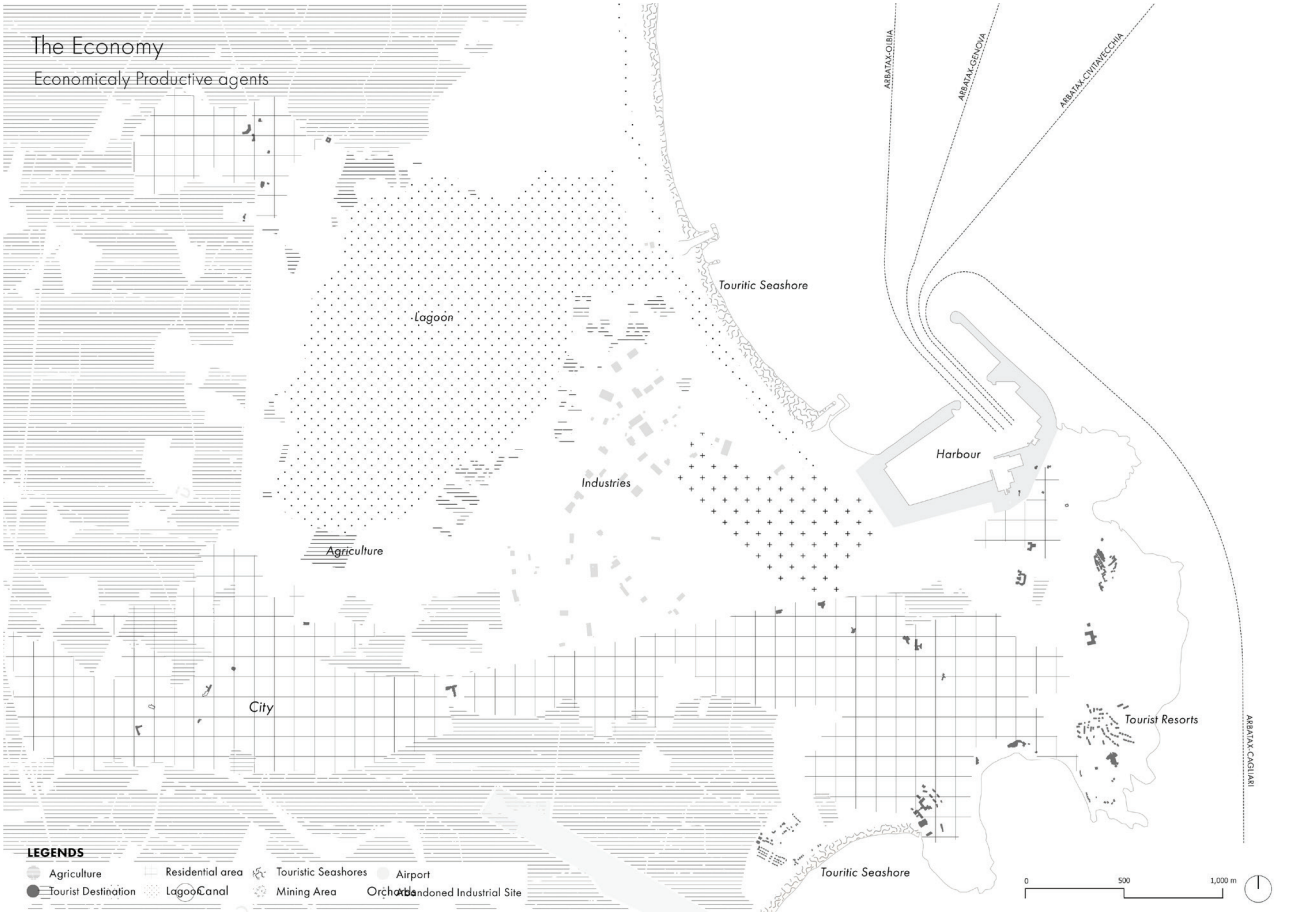
Bundling Ecological flows at Local Scale

Figure 66: Transformed Ecosystem.
Source: Author



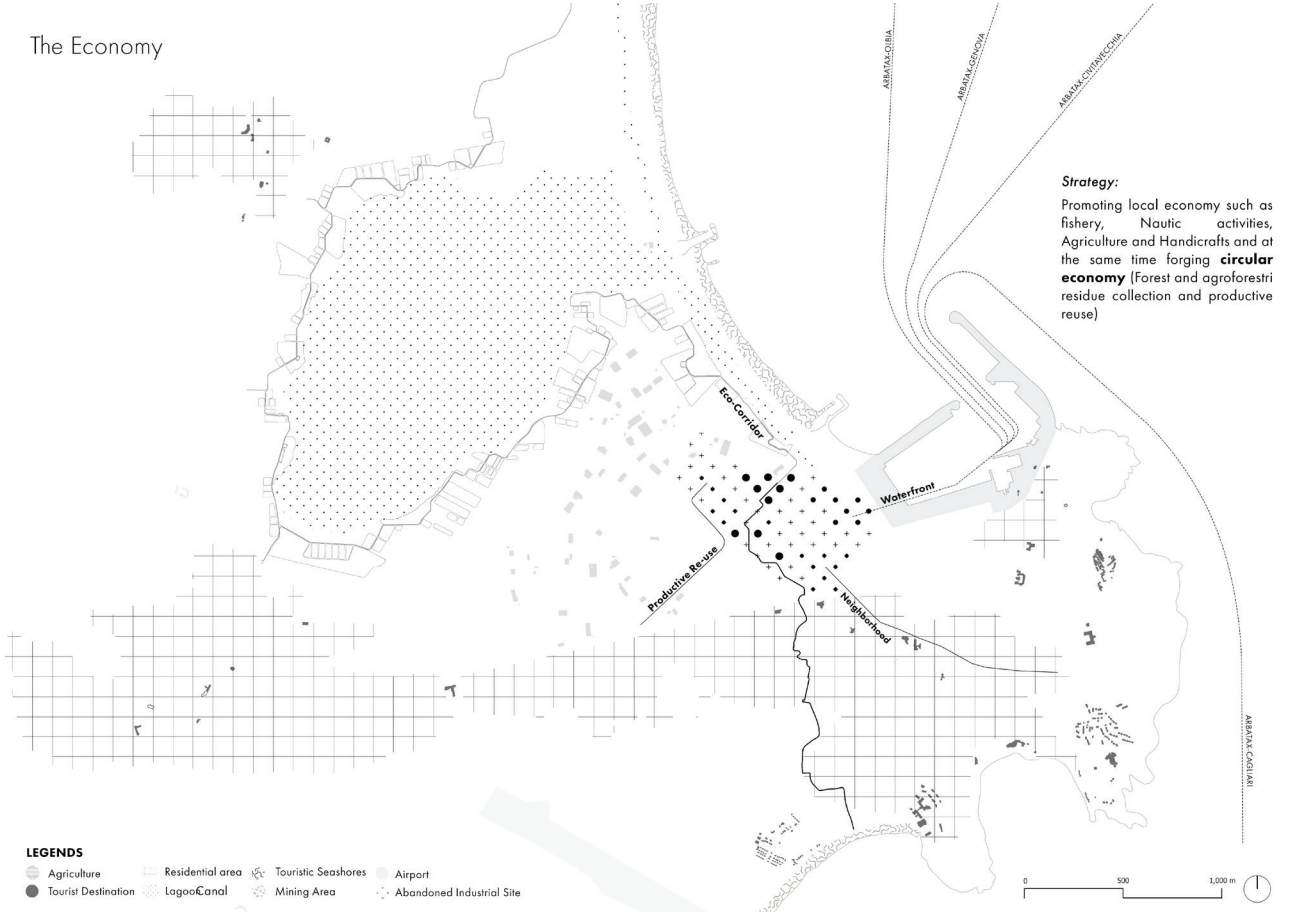
Economical Flows at Local Scale

Figure 67: the Existing Economical agents.
Source: Author



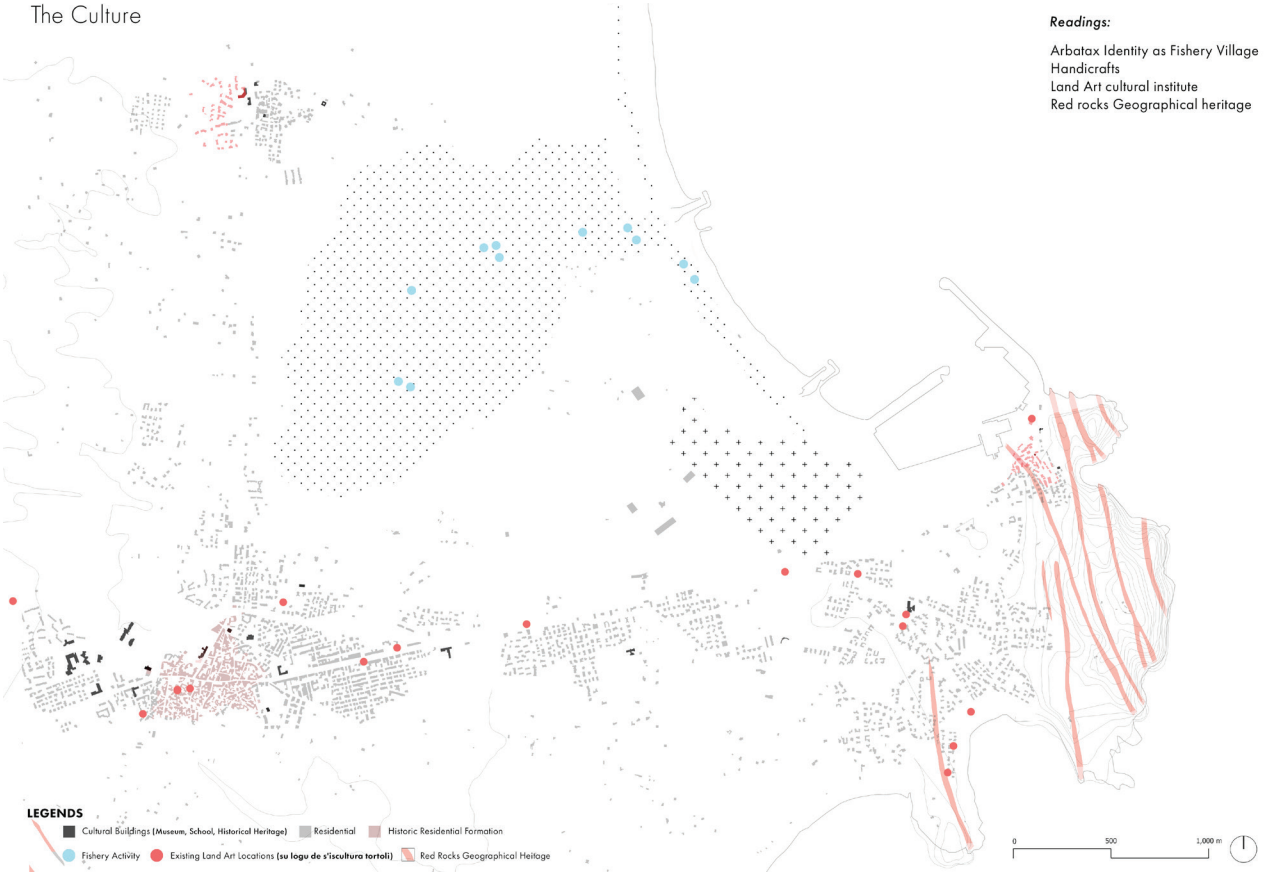
Bundling Economical Flows at Local Scale

Figure 68: Transformed Economical Agents.
Source: Author



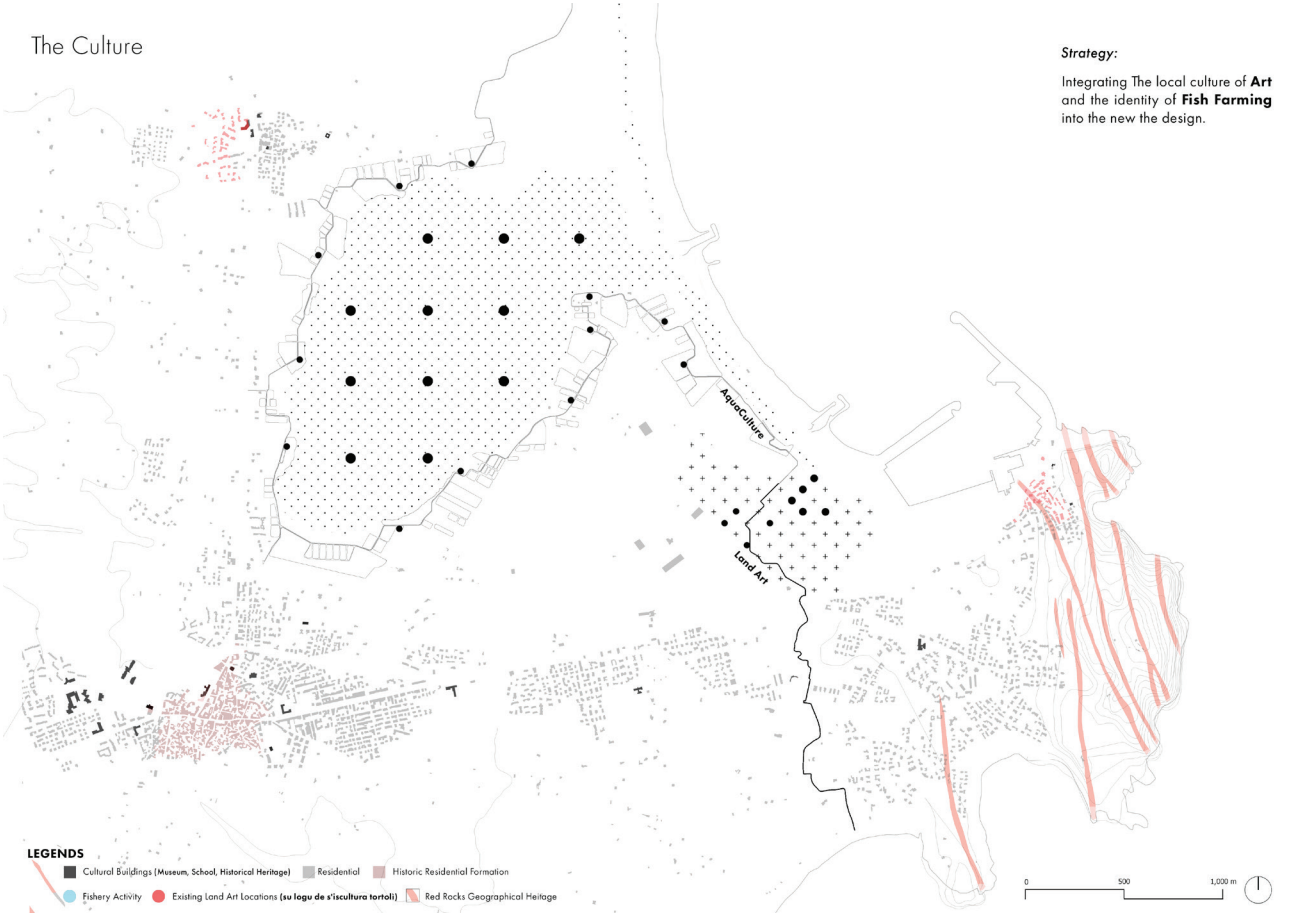
Cultural Flows at Local Scale

Figure 69: Existing Cultural Elements.
Source: Author



Bundling Cultural Flows at Local Scale

Figure 70: Transformed Cultural System.
Source: Author



General Strategy

Figure 71: General Strategy at the local scale.
Source: Author

Regional Scale Master Plan

Figure 72: The master plan of the Regional Scale.
Source: Author

Zoom In

The System of pocket Parks,Orchard and Land Arts along with micro activities

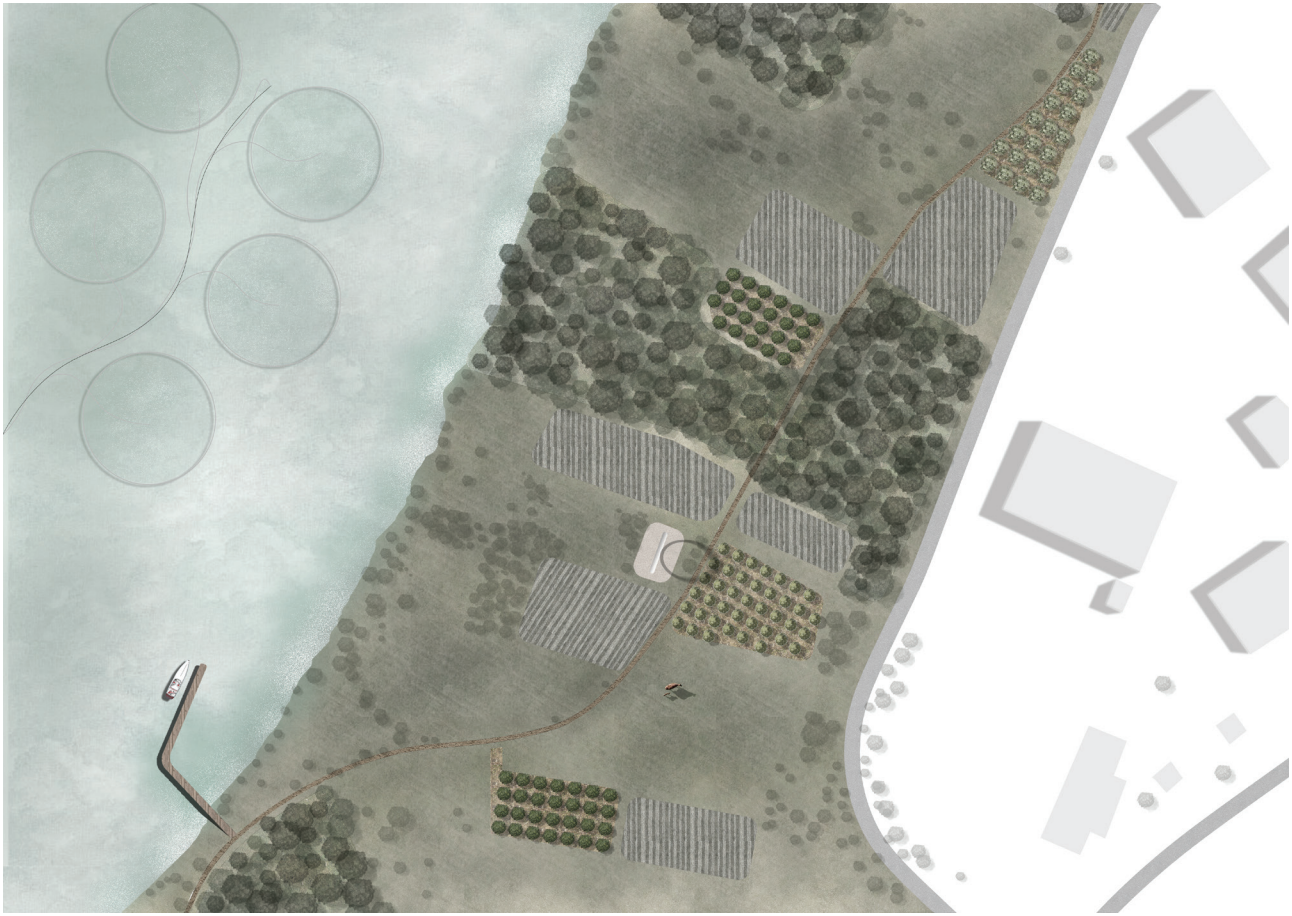


Figure 73: Zoom in plan of the buffer around the lagoon.
Source: Author

08
Design

Design Description

The design goal is to re-think the relation between a wasted landscape and the context of the site through a Systemic Design approach. The proposed project will promote the local economy while enhancing the ecological network interrupted by human activities. It is an ecological renewal of an industrial area, which through a networked response system will reclaim the value of a former productive site.

Specifically, the design aims to link environmental improvement to economic developments and on a social scale, the project is a programmatic activator of public activities. These objectives would be achieved through strategies in three different scales:

First, at the territorial scale, the project aims at reconnecting the lagoon as a biodiversity interest area to the larger ecological hub. The connection is now interrupted by agricultural activity. This objective would be achieved through a system of green corridors identified on river basins and riparian woodlands that connect the lagoon near the industrial site to the larger green system.

Secondly, at the medium scale, a resilient green buffer around the lagoon connects the corridor to the site. This green buffer is a place where art and local agriculture plays a key role in social and economical activities while preserving the lagoon buffer from deforestation.

The third is the site of the Paper Mill at the urban scale and the relation of the site to the immediate surroundings such as the Sea, City, and the lagoon. At this scale, the design creates a dialogue between these three agents.

Through principles of Systemic Design, the landscape is transformed into something different, a place sensitive to different transformations, which records the movements and events that cross it (Da Sousa, 2002)

To create a successful and sustainable reclamation design it is important to recognize and interpret the historic and cultural significance of the landscape and to understand how "landscape ecology and design can invent alternative forms of relationships between people, place, and cosmos so that landscape architectural projects become more about invention and programs rather merely corrective measures of restoration" (Corner. J, 1996). Any attempt to define principles for good design must embody the principles of sustainable development. Building design, landscape design, and urban design must be brought together to deliver a more integrated, skilled, and effective design process. (L. Loures & T. Panagopoulos, 2007).

The immediate vicinity to the port of Arbatax has made this place of the highest value for the seafront development and a new gate to the city that has been discussed and put in the competition by the municipality but failed to proceed with a successful design proposal. The port is a gate to the Sardinia region also that welcomes commercial and tourist ships from the Italian mainland and other parts of the world.

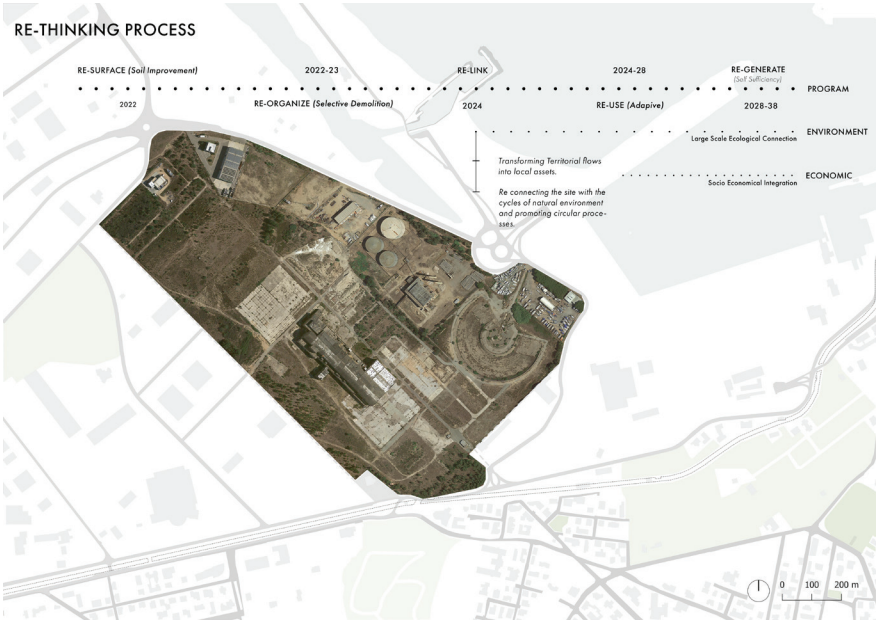


Figure 74: Re-Thinkng Process.
Source: Author

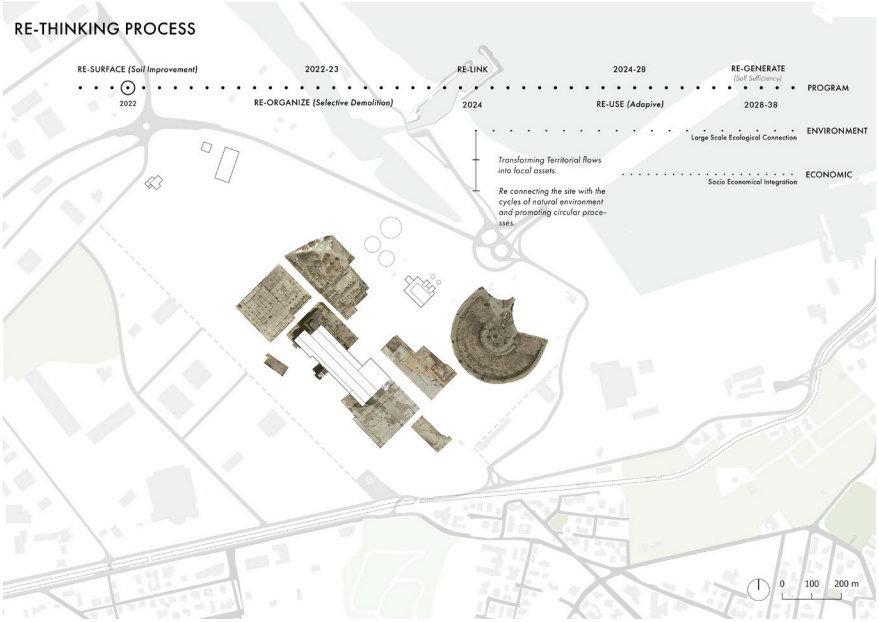


Figure 75: Re-Thinkng Process.
Source: Author

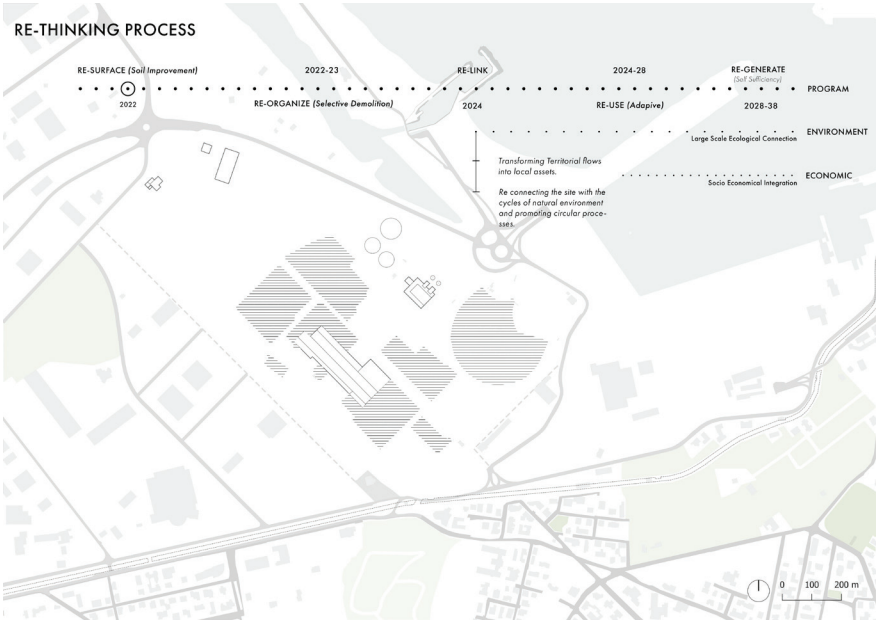


Figure 76: Re-Thinkng Process.
Source: Author

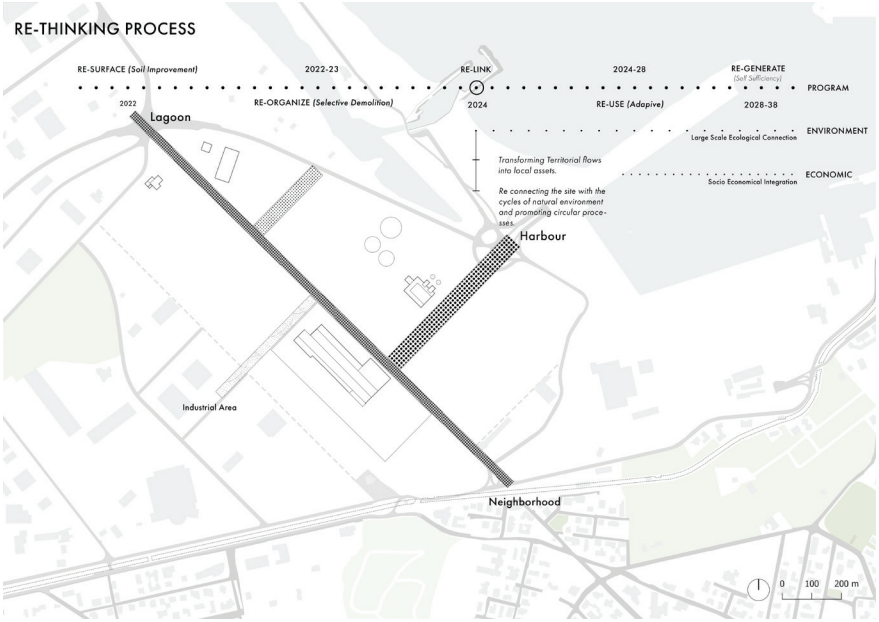


Figure 77: Re-Thinkng Process.
Source: Author

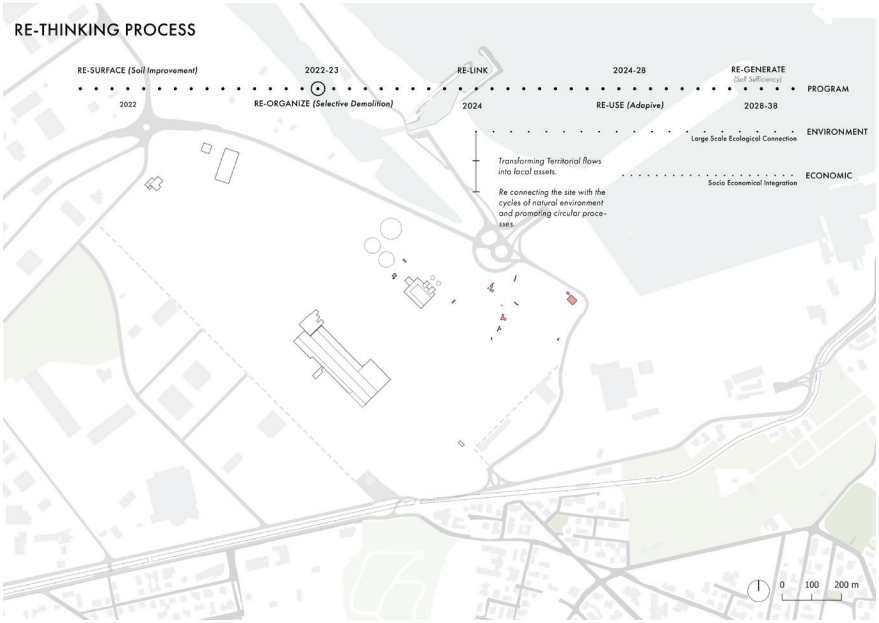


Figure 78: Re-Thinkng Process.
Source: Author

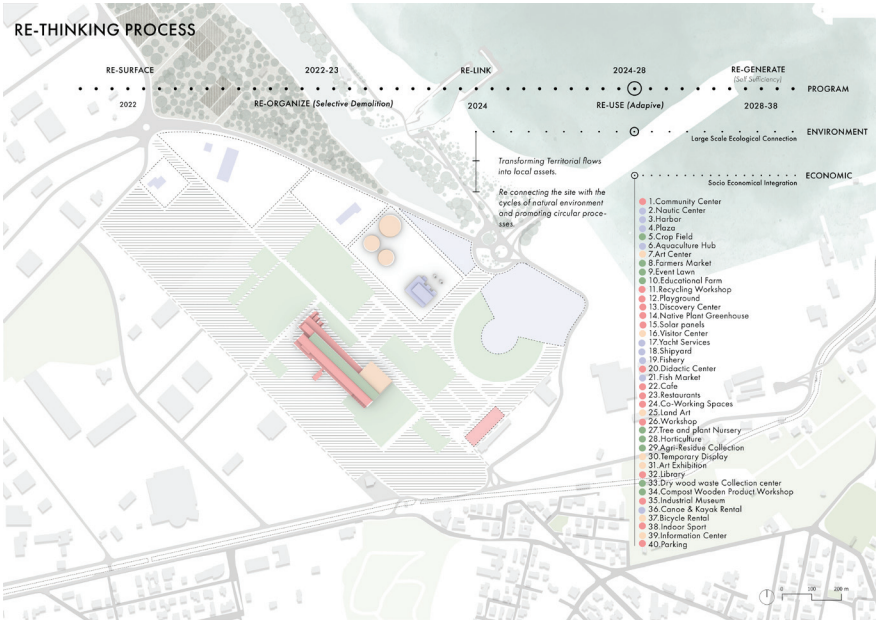


Figure 79: Re-Thinkng Process.
Source: Author

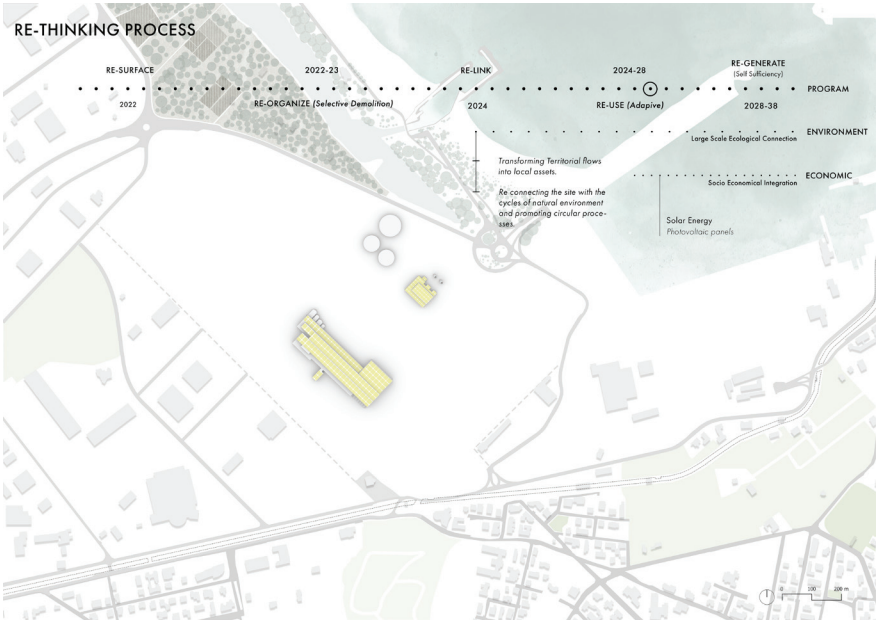


Figure 80: Re-Thinkng Process.
Source: Author

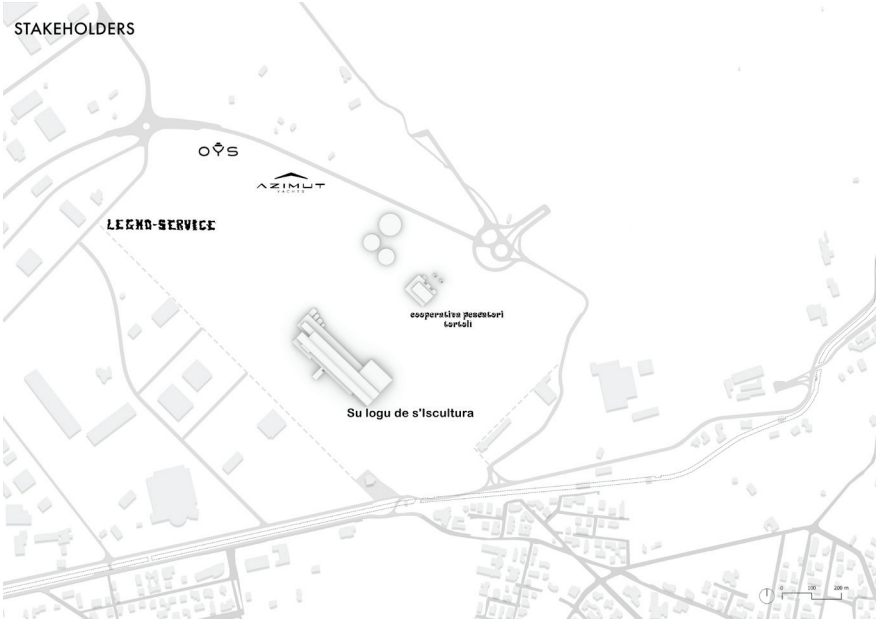


Figure 81: Re-Thinkng Process.
Source: Author

The design proposes a delicate and silent approach towards the new inputs. Generally, it is composed of 3 main elements which are Adaptive Re-used Buildings, Re-defined scattered surfaces (Soil Phytoremediation), and Experimental Paths. The rest of the area of the site is let free as a concept of Third Landscape since nature has overcome these areas during 20 years of abandonment and creates a picturesque landscape as a result.

Figure 82: Re-Surfacing Areas of Target.
Source: Author

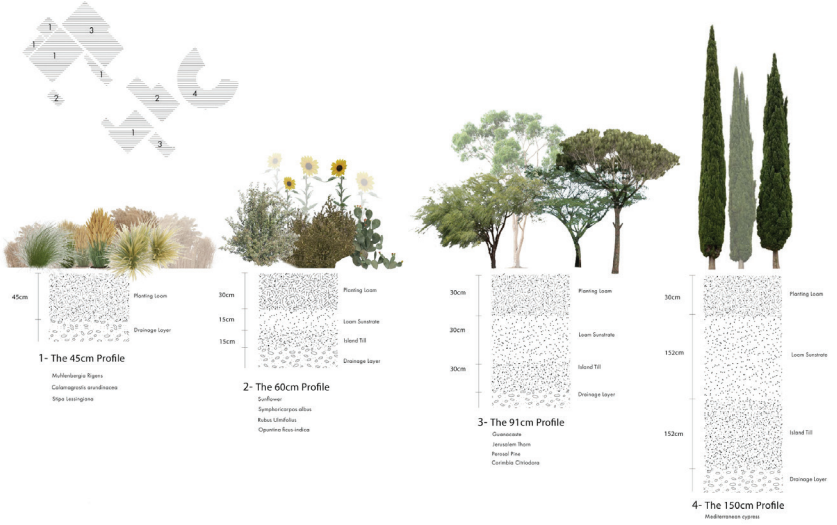


Figure 83: Soil Profiles for Planting Palette
Source: Author

Figure 84: The New Land Typologies
Source: Image from: Sardegnaabandonata.
it
Diagram Source: Author

The Responsive Program Formulation System

The Diagram below demonstrates the demands of the site and the programmatic responses and the correlation between each element to the others. In this way, the design creates a system of feedback loop in which each function is promoting another while responding to a specific site demand.

Figure 85: The Program formulation System.
Source: Author

Adjacency Matrix

Placement vicinity of the new programs

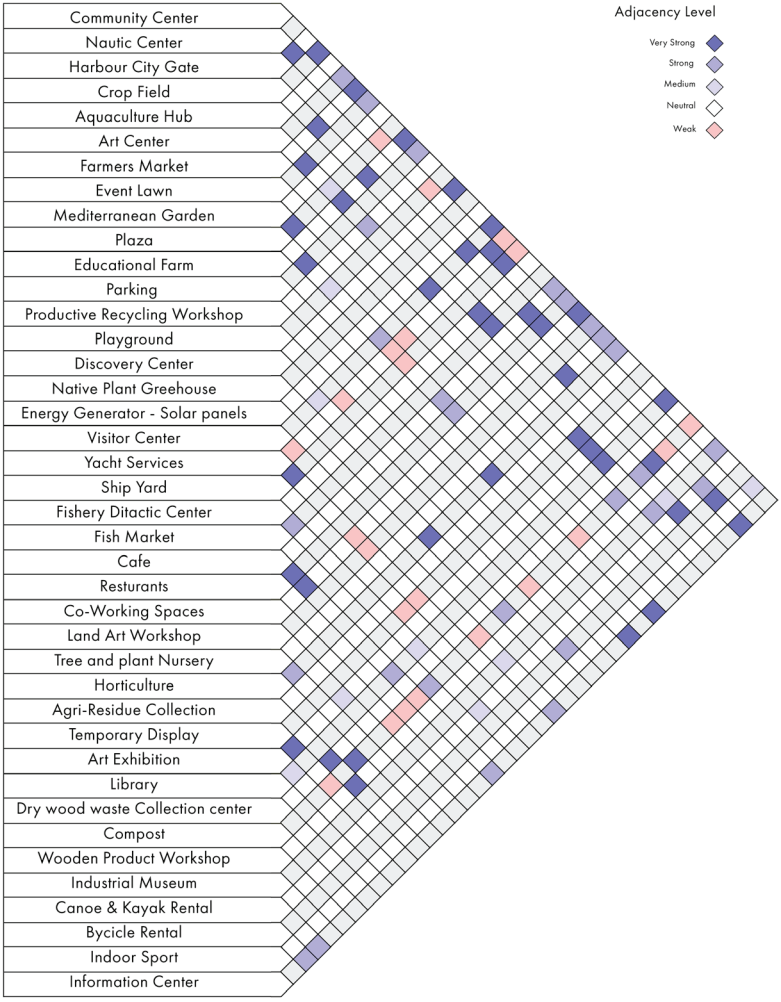


Figure 86: Adjacency Matrix.
Source: Author

Master Plan

Urban Scale

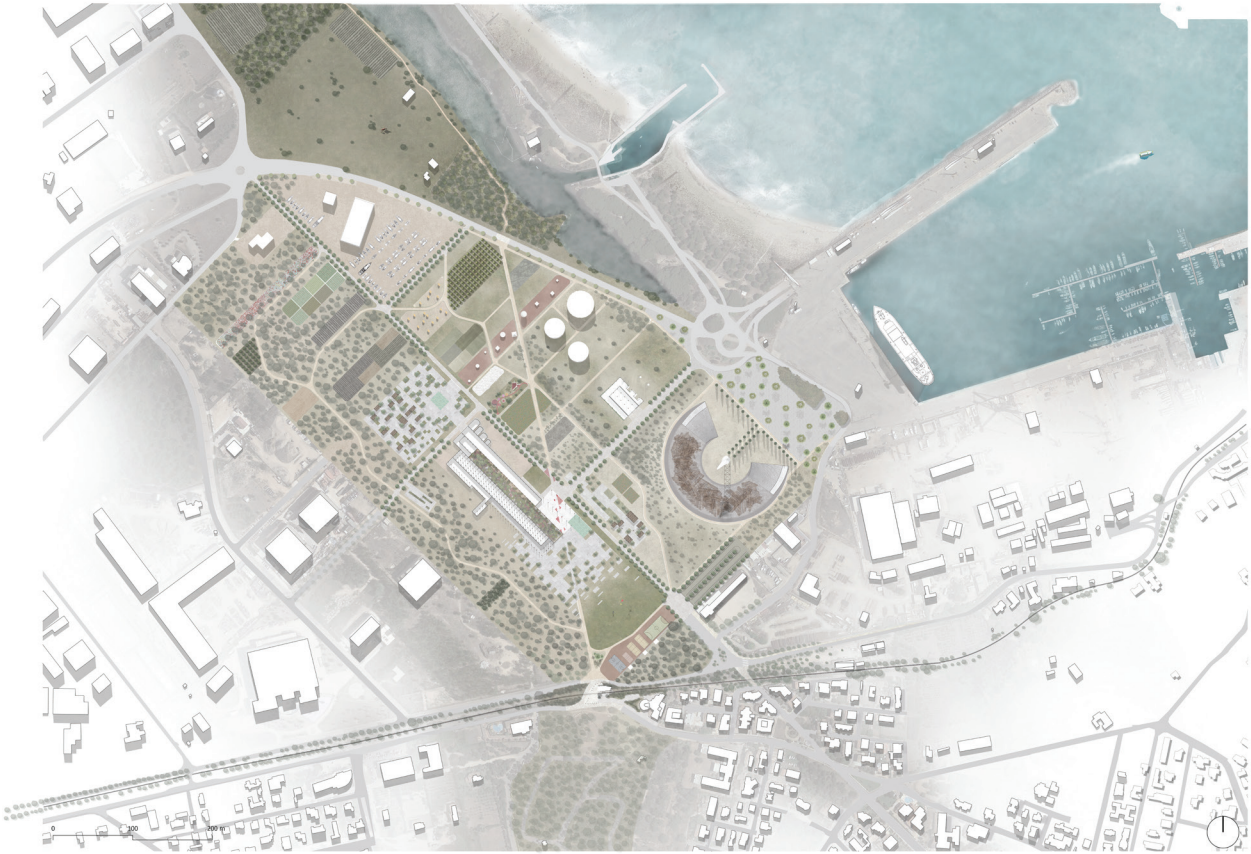


Figure 87: Master Plan - Local Scale.
Source: Author

Layers of the Site

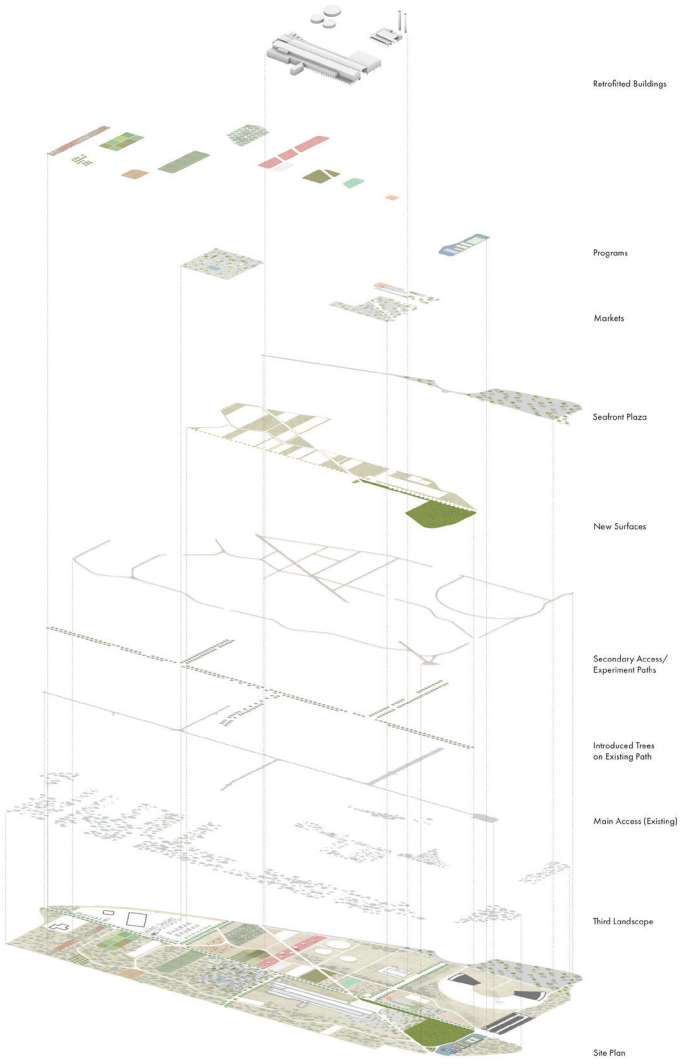


Figure 88: Exploded Diagram.
Source: Author

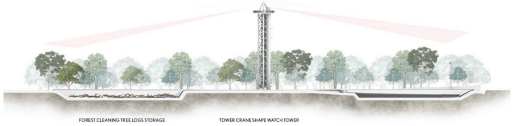
Sections


GREEN HOUSE
DISCOVERY GARDEN
DISCOVERY CENTER
SEMI-OPEN PUBLIC SPACE
THE PRESERVED NATURAL HABITAT

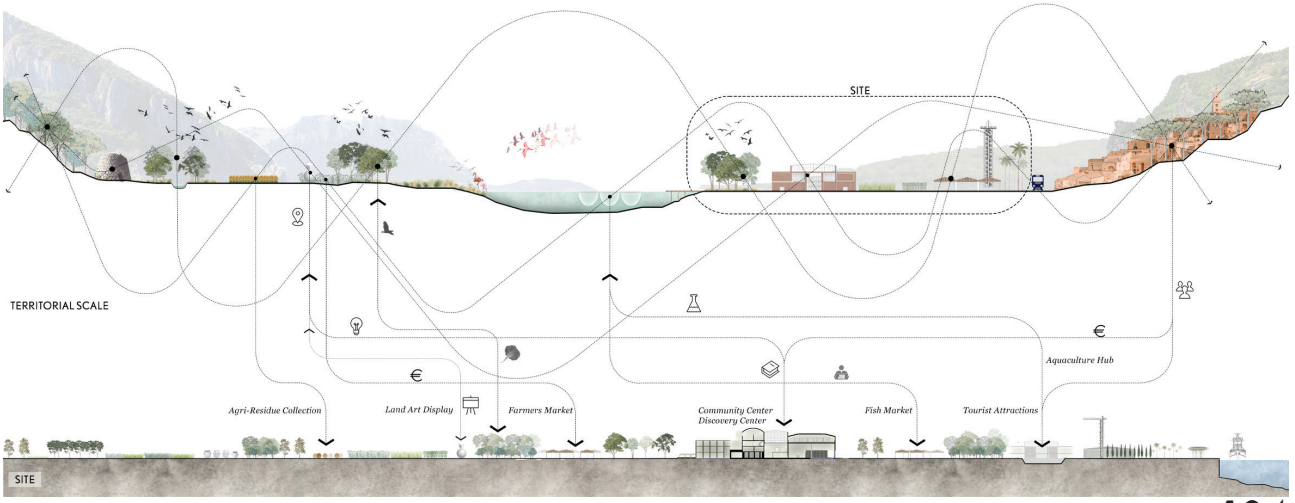

MULTI FUNCTIONAL SPACE
THE PRESERVED NATURAL HABITAT
WALKING PATH
DIDACTIC CENTER
CAFE
COMMUNITY CENTER & AQUACULTURE HUB


ORNAMENTAL NATIVE PLANTS
LOCAL AGRICULTURE
EDUCATIONAL FARMS

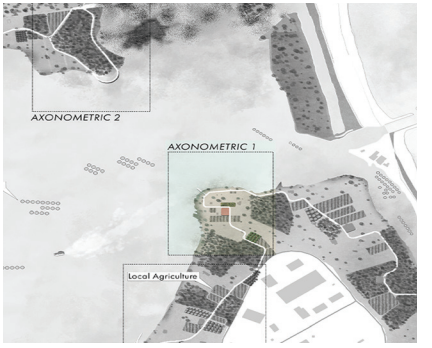

OPEN LAWN
SPORT FIELDS
THE PRESERVED NATURAL HABITAT


FOREST CLEANING TREE LOGS STORAGE
TOWER CRANE SHAPE WATCH TOWER


CROP FIELDS
LAND ART. TEMPORARY DISPLAYS
PLAYGROUND


SITE
TERRITORIAL SCALE
Aquaculture Hub
Agri-Residue Collection
Land Art Display
Farmers Market
Community Center
Discovery Center
Fish Market
Tourist Attractions
SITE

Axonometric View 1



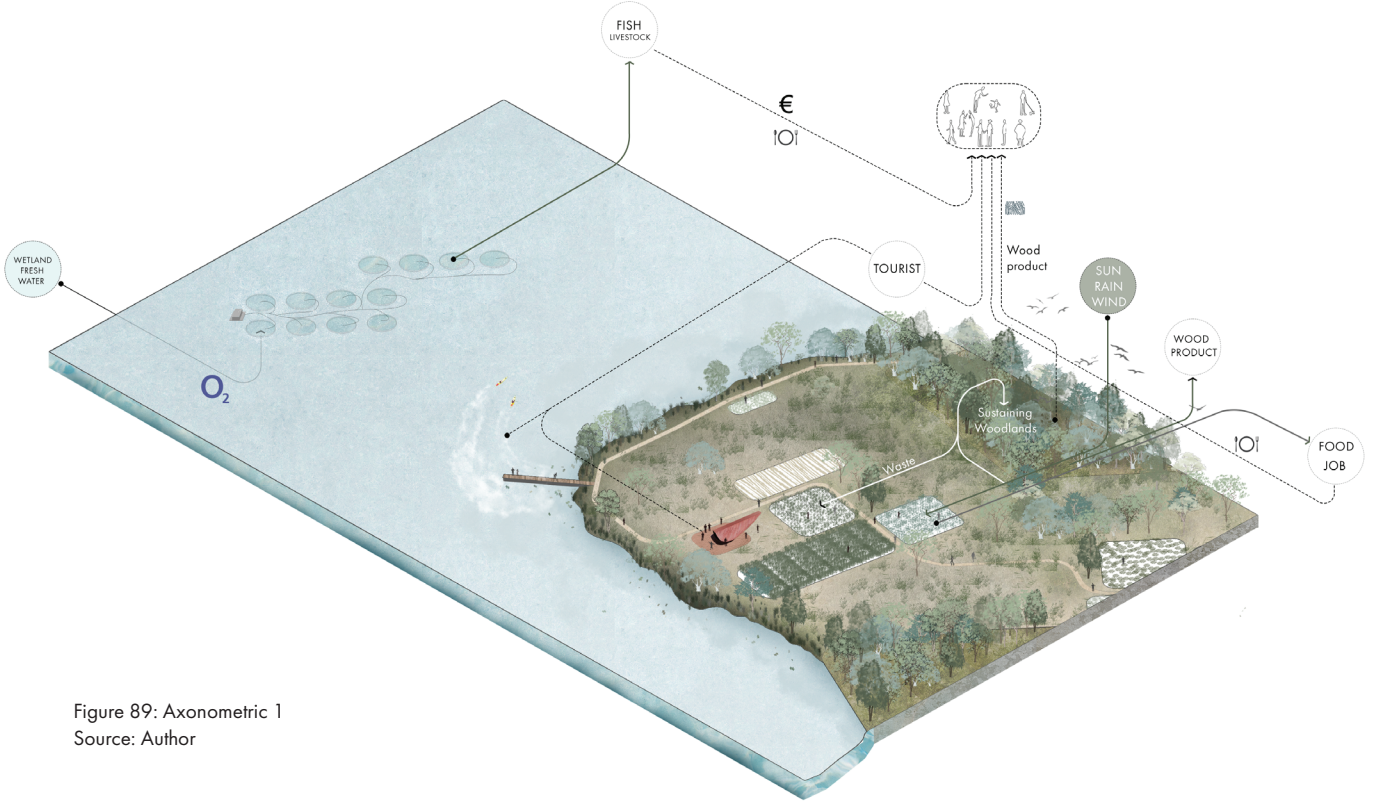


Figure 89: Axonometric 1
Source: Author

Axonometric View 2

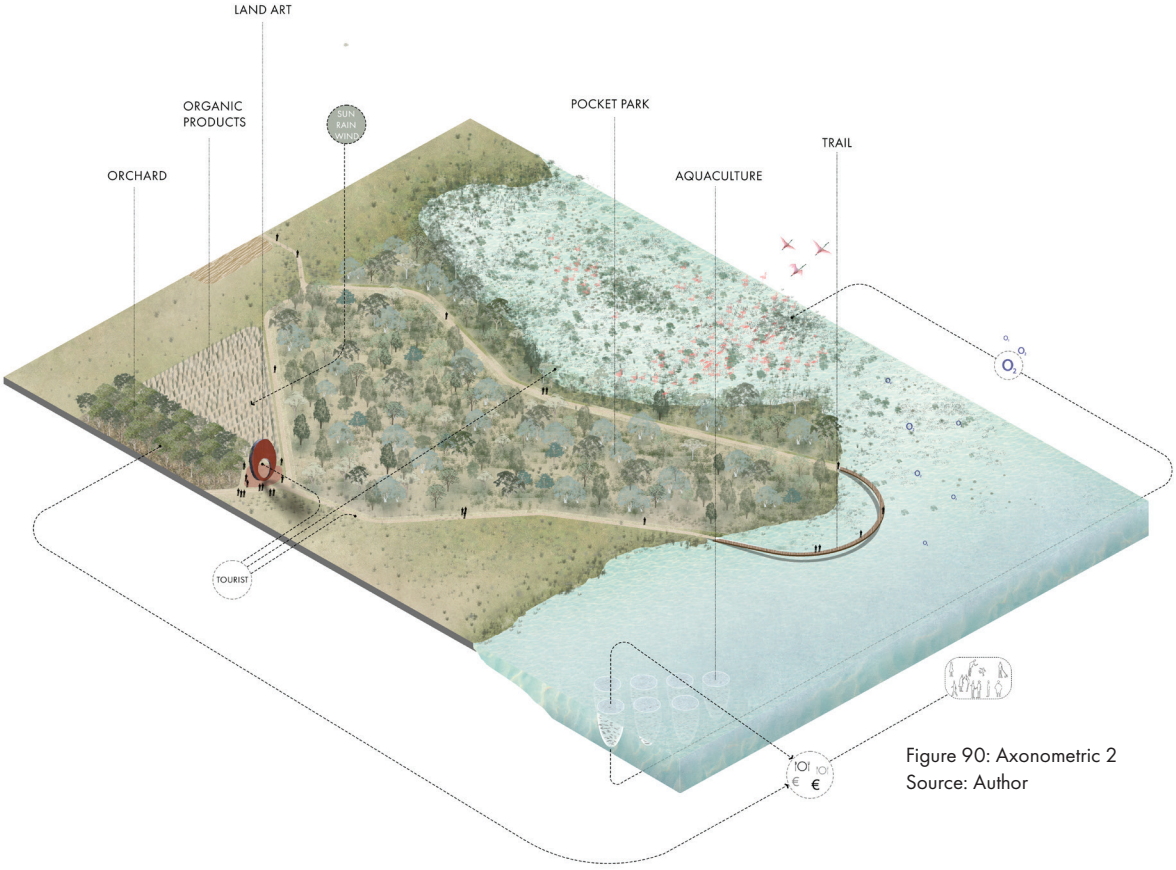


Figure 90: Axonometric 2
Source: Author

Axonometric View 3

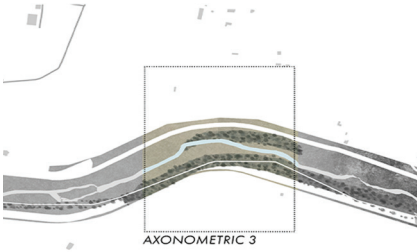
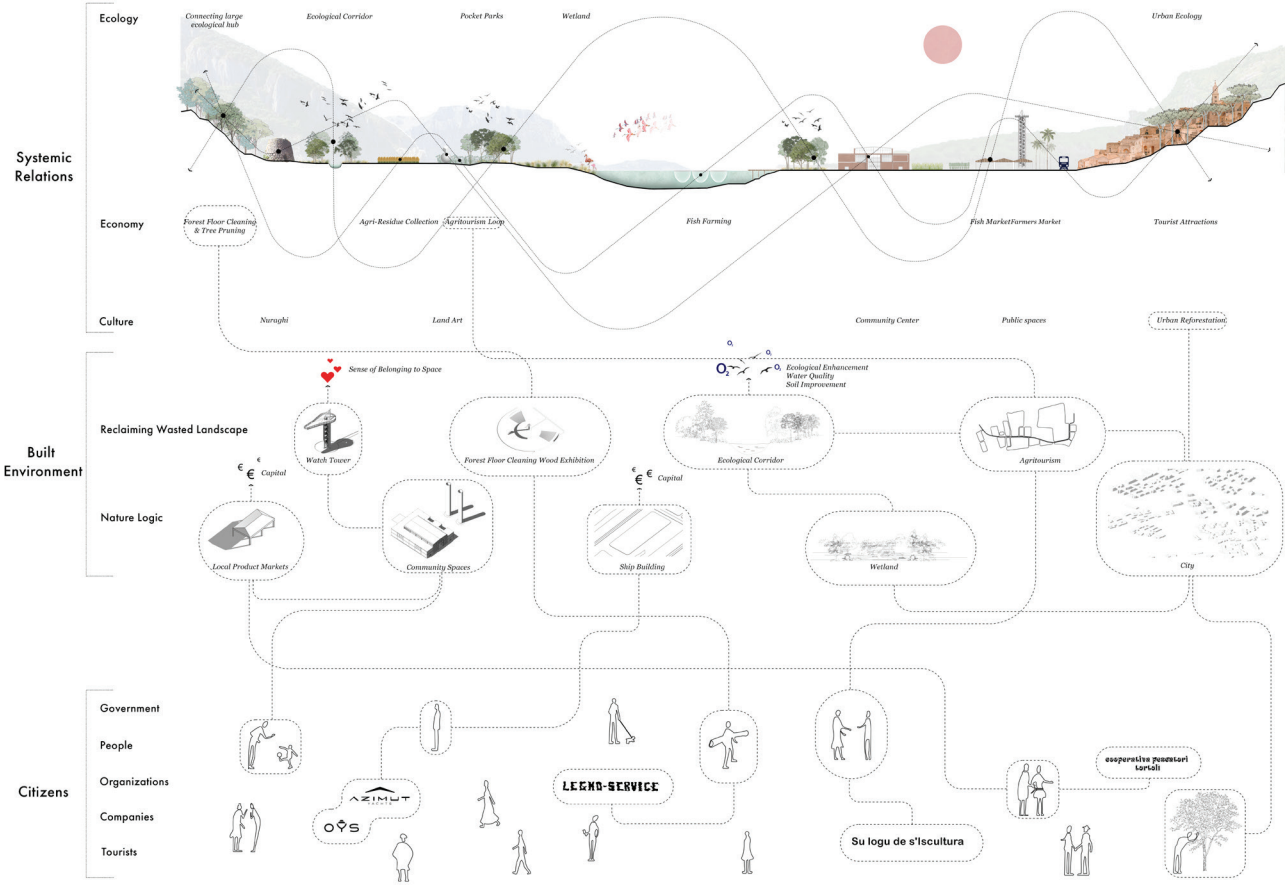


Figure 91: Axonometric 3
Source: Author

The Systemic Relations

Figure 92: The Systemic Relations Diagram.
Source: Author



Perspective Sections

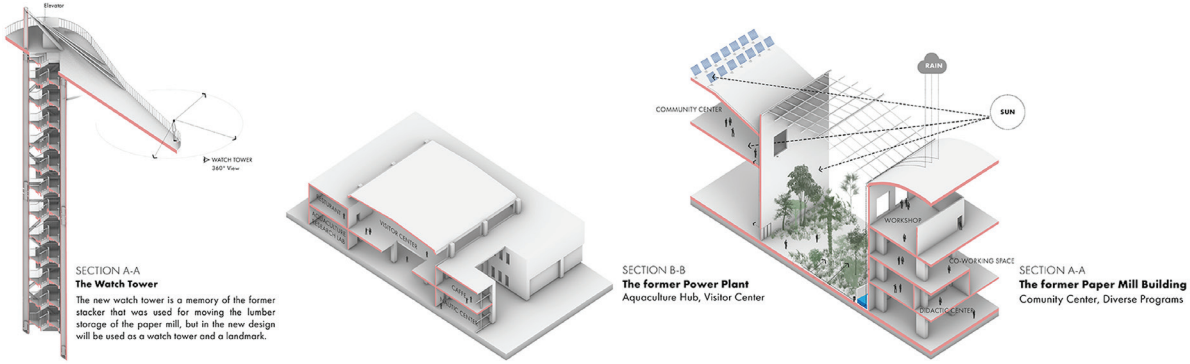
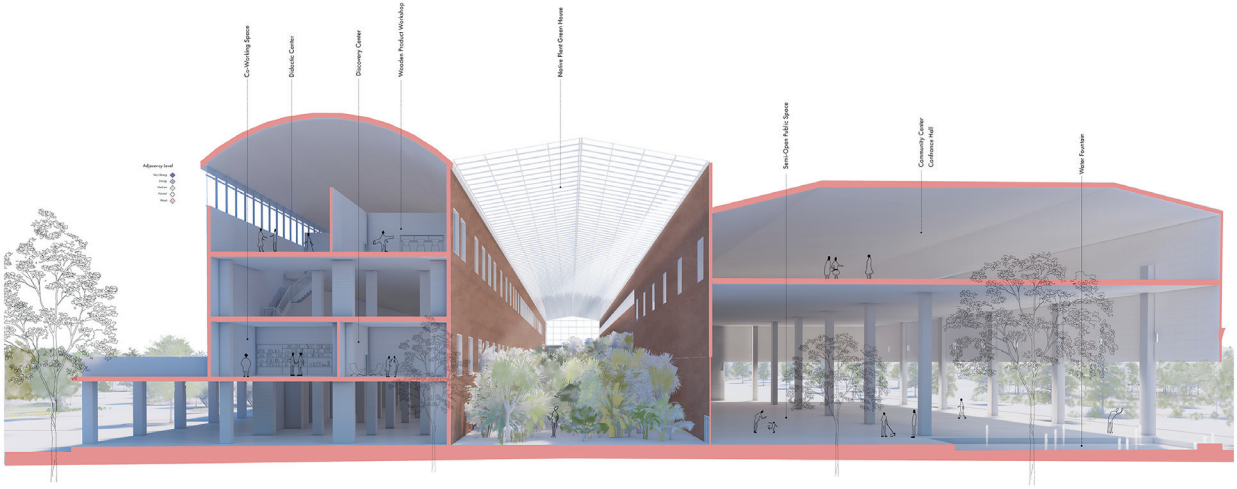


Figure 93: Perspective Sections
Source: Author

Figure 94: Perspective Section of the Paper Mill Building
Source: Author



Soil Profile for Plant Palette

The diversity of the physical conditions across the site together with the variety in the proposed plant palette of the reclamation plan require thet a series of soil profiles be designed. This process assures that the soil wil closely match the neds of the plants for sustainability and increases the efficiency of the reclamation process. Thus, there is no need to have deep soils al over the reclamation area.

Figure 95: Plant Plette Location
Source: Author

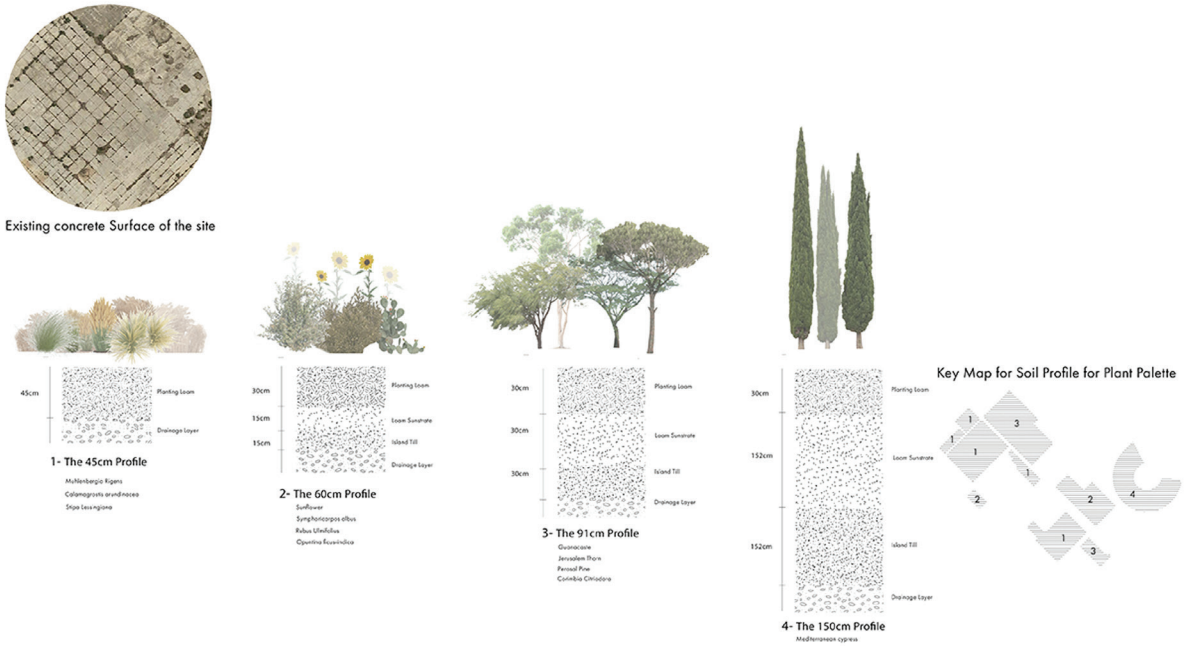


Figure 96: Illustration of the art displays among the third landscape and organic crops
Source: Author

Figure 97: Illustration of the Plaza in the northern part of the paper mill.
Source: Author

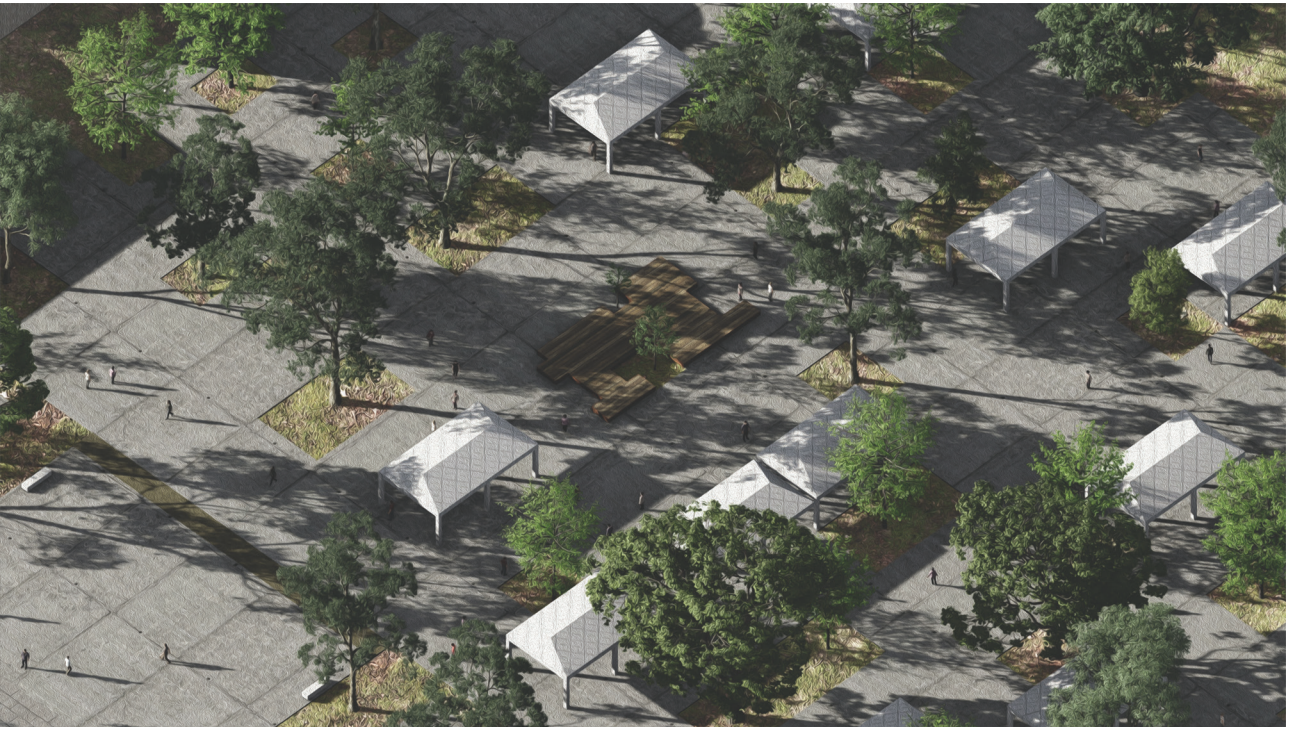


Figure 98: Farmers Market and space making on top of the existing concrete surface.
Source: Author

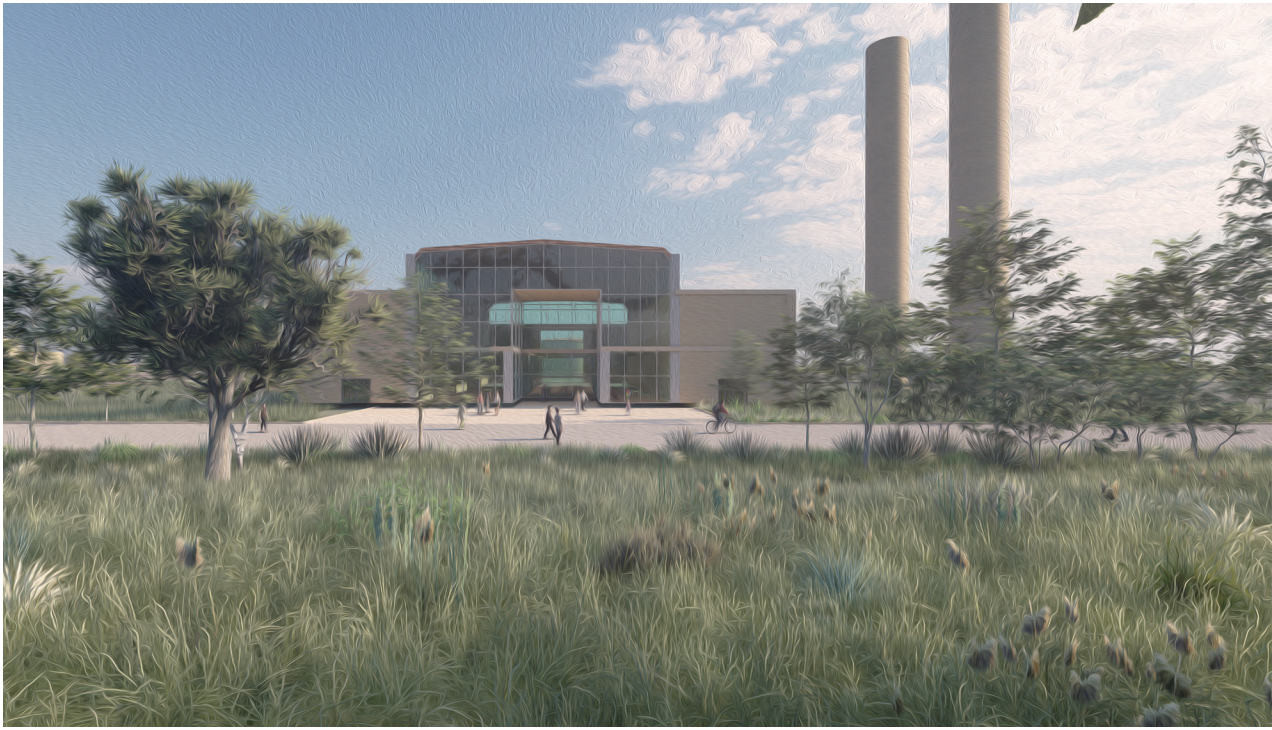


Figure 99: The Aquaculture hub.
Source: Author

Figure 100: Sport Fields near the enterance.
Source: Author

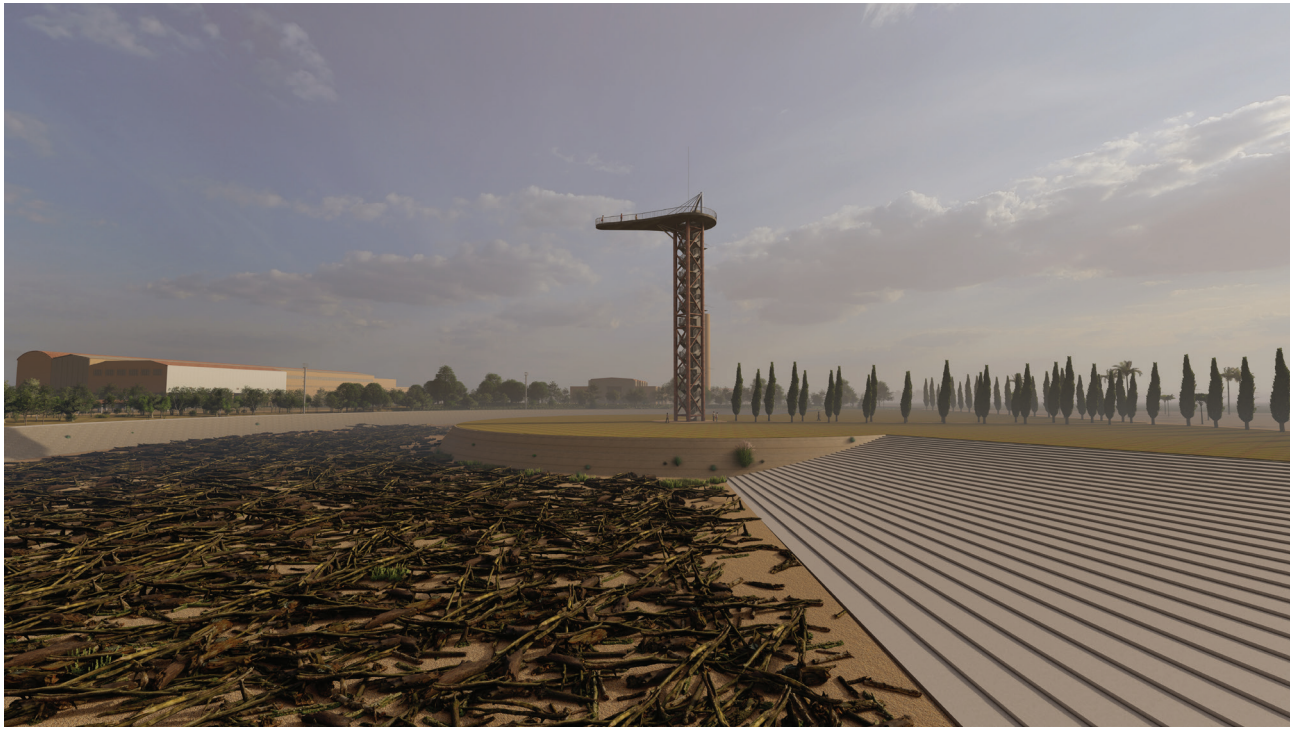


Figure 101: The former stacker area and the watch tower whith forestal cleaning s inside the stacker area as a exhibition of woods, Metaphorically reminds the lumbers used for the paper mill.
Source: Author

Conclusion

The Systemic Reclamation Process of the former Arbatax Paper Mill regain what the place has lost after the closure of the factory and an abandoned area acts as a hinge to reconnect people to nature and to nature to flow freely in an urban context while generating socio-economical benefits for the city dwellers. The design avoids erasing people's memory and it celebrates the industrial identity of the place and will add value through different endeavors such as landmarks that resemble a historic phenomenon but acts as a contemporary element. Linking the environmental improvements of the regional scale to economical and leisure activities has made it possible all the way through systemic design. Among the goals that the project has achieved, minimizing the negative impact of the city on the surrounding environment and maximizing the area's aesthetic and ecological functionality could be addressed strongly.

Moreover, new job opportunities are replaced with the 700 job losses that the factory closure has left behind. through these new economical activities, social interaction will be made and a new community forms out of a heavily disturbed site. The design process has been a non-linear decision making and planning that works to regain the value of the space with strategically networked feedback mechanisms to create a system that helps human activities to co-exist with dynamic ecology, this achievement is best visible along with the lagoons buffer and the ecological corridors. The buffer around the lagoon will be a platform for people to experience ecological independence which people rarely experience in urban areas compared to what a farmer does on a farm. This way of designing creates a synergy that the action of its sub-components creates a result much stronger than their individual efforts.

The design's logic sets an offensive adaptation to the surrounding forces rather than defensive maintenance of delicate elements in need of constant preservation and it has so many competing demands and flows of energy crossing it that could easily turn it into a tossed salad, but rather, the design has established a strong framework that gives it a pleasing order.

In conclusion, we could argue that **a system is** not the sum of the behavior of its parts, rather it's **the product of** their **interactions**, as a farmer's market is a useless matter without a system of organic farms.

06
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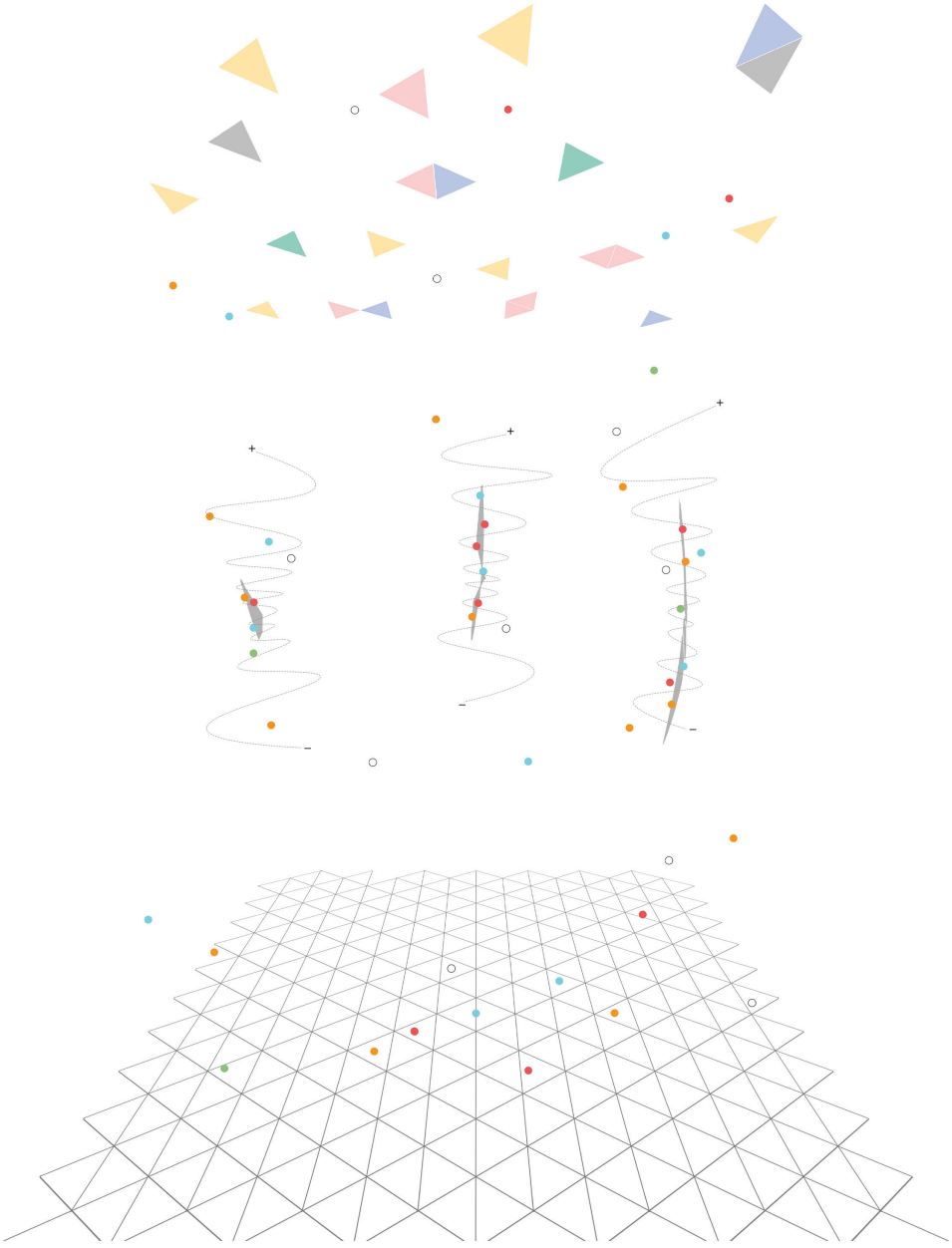
Land is seen not simply as inert matter or commodity, but as a dynamic web of living Systems.

Niall Kirkwood, Manufactured Sites



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