THE RECOVERY OF URBAN PRODUCTIVE LANDSCAPE: ISSUES AND PERSPECTIVES

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Abstract

Over the centuries, architectural technologies have been a privileged means for a balanced interaction between natural and human creativity. The industrial development marked a turnaround for physical space, denying, by the name of economic growth, past synergies between spaces - technology - society. The persistence and pervasiveness of the economic and productive crisis are the reference scenario for the research commitment. The paper envisages a design approach mitigating the vulnerability of settlements, that lost their inner attitudes, through a recovery approach able to enhance past vocations.

The ancient principle to use without consuming, supports a methodology based on the following actions: analyzing past transition drivers**,** outlining technological misalignments, building a transition agenda**.** The potential for growth is investigated, taking into account new requirements and previous performances. Focusing on manufacturing settlements located on the south of Italy, this research fits into the broader context of sustainability for places altered by technological transitions. The research assumes, as a privileged object of observation built environments hosting activities related to the agri-food processing, along the Vesuvius coast. Since ancient times, the need to create an added value, promotes interactions between products and places. A synergy, between technological culture and architecture, informs the quality of food, marking the urban environment in terms of constructive choices, distribution and morphology, environmental behaviour for spaces.

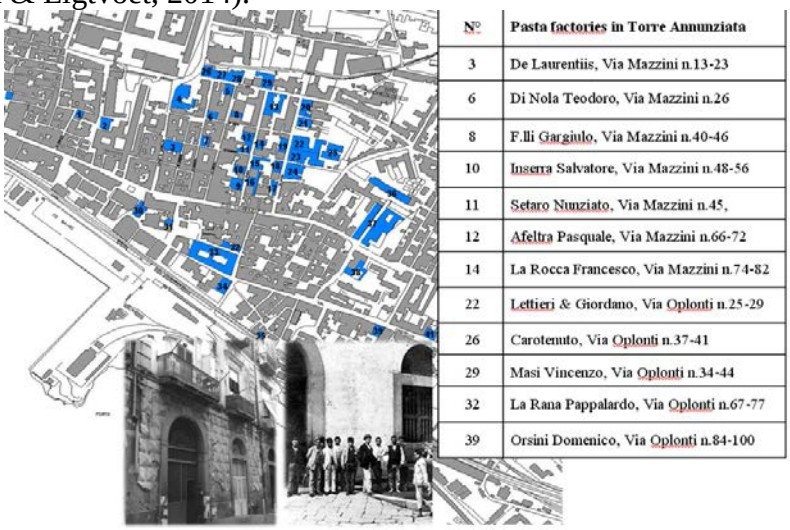
The research carried out in the LRRM lab, tends to the identification of a systematic set of drivers of change that can support the recovery. The scientific commitment is based upon the awareness to recreate, within urban landscapes, the system of relations, human-scale, balanced to meet the physical, economic and social needs.

Keywords: Manufacturing, landscape, buildings, vulnerability, recovery

Introduction:

Within Western cultural dynamics, *urban landscape* has been assumed, with its streets, squares, buildings, as one of the most impressive and lasting documents (UN–Habitat, 2012). Being made of stones, built landscape opposes great strength to the seduction of the homologation that signs our globalization era (Benvenuto, 1984). In the contemporary scenario of turbulent change, mitigating its vulnerability is a fundamental process (Childers, 2014), in order to support the resources' conservation and to promote a holistic development for natural, economic, cultural capitals (Fusco Girard, 2014 a). Creating dialogue opportunities between places and processes (Gluch, 2013), is assumed within the experience of the LRRM lab at the University of Naples Federico II, as a design priority with the aim of coping with local and global emergencies. Exceeding the aesthetic conception that informed landscapes' studies for decades, the group relating to the Lab observes the processes occurring to landscapes with the support of a systemic conception, under a requirements and performance perspective (Fusco Girard, 2014 b).

The paper deals with the recovery strategies for agri – food processing settlements, along the Vesuvius coast. Since ancient times, these areas are characterized by interactions between manufacturing and places' configuration (Sayer, 2013). A synergy, between technological culture and architecture, informs the quality of products (Domon, 2011). Continuity in terms of technical choices, morphological, dimensional, here long, features the building activity (Dal Sasso & Caliandro, 2010). A set of incremental improvements along constant trajectories, marks the transitions for spaces, with new products, changes in markets, practices and infrastructures (Chappin & Ligtvoet, 2014).



N°	Pasta factories in Torre Annunziata
3	De Laurentiis, Via Mazzini n.13-23
6	Di Nola Teodoro, Via Mazzini n.26
8	F.lli Gargiulo, Via Mazzini n.40-46
10	Inserra Salvatore, Via Mazzini n.48-56
11	Setaro Nunziato, Via Mazzini n.45,
12	Afeltra Pasquale, Via Mazzini n.66-72
14	La Rocca Francesco, Via Mazzini n.74-82
22	Lettieri & Giordano, Via Oplonti n.25-29
26	Carotenuto, Via Oplonti n.37-41
29	Masi Vincenzo, Via Oplonti n.34-44
32	La Rana Pappalardo, Via Oplonti n.67-77
39	Orsini Domenico, Via Oplonti n.84-100

Image 1: The urban productive landscape in Torre Annunziata (Naples)

During the twentieth century, suddenly, a technological mismatch between *ancient magisteria*, and construction opportunities, overwhelms these settlements (Wienand, 2013). Replacements take over the slow process of aging techniques, gained over many millennia, tiling and overlapping systems and devices deduced from different cultures (Image 1). Each productive building, and the whole urban texture, suffers the sudden interruption with local tradition. In a very short time, technologies and practices undergo a lack of correspondence and consistency, both in terms of final performances and aware involvements (Feenstra, 1997). Uncontrolled anthropogenic events induce a progressive and profound disconnect between culture and environment. The craft model, which had its strength in local resources - water, sun, wind - is denied with the de-contextualization of activities. Traces of these transformations are deeply evidenced in those places, where technology loses its role as an intermediary with society, changing the rules of growth. Increasingly, this trend undergoes a worsening of conditions following the onset of buildings' damage and failure.

Enabling compatible transitions is the aim of the approach, linking past processes with present vulnerabilities, taking into account environmental and technological behaviours. The recovery methodology here proposed, focuses on the relations between technological regimes and spaces, taking into account the following steps and activities:

1.Analysing the impact of slow pressures and unexpected shocks on the built; quantitative data (statistics, historical data) and qualitative information (about values, stakeholders, interrelations, routines, power and empowerment) support the description of events under a long-term perspective.

2. Outlining the vulnerabilities due to processes of constructive misalignment; in recent years, uncontrolled decay processes of the performance levels, affect the built, triggering fault conditions of the technological units, changing the whole life cycles.

3. Building active protection pathways through compatible transition drivers.

2. Unexpected shocks on built environments

Since ancient times, Campania is a fertile region, at the top for its agri – food production. In the second half of the sixteenth century, the Vesuvius area undergoes impressive architectural transformations, aimed at specializing ancient built environments for agro-industrial manufacturing. Constructions and settlements are re - designed and transformed with the special aim to optimize landscape's productive attitudes.

An indissoluble link between local morphology and climatic agents affects productions and spaces organization. The microclimatic conditions on

the slopes of the Vesuvius, deeply impact in defining buildings' qualities, in a site where the sun, the fresh breezes from the sea, the waters, are put to the service of the ability of artisans. In addition to these aspects, other features such as the attitude of local entrepreneurs to accumulate capital, their spirit of enterprise, a relationship with politics and government, at both central and peripheral, a technical basis, a viable market, the growth of local entrepreneurship, influence the architectural and urban solutions.

Significant among all the Vesuvio settlements is the case of Torre Annunziata (Dati, 1962). In the last decade of the sixteenth century, the Count Muzio Tuttavilla decides to equip the coast with settlements devoted to the production of dry pasta food. The project starts off with a reorganization plan on the morphology: in 1592, the Count instructs Domenico Fontana in the construction of an artificial channel which, from the springs of the Sarno to Episcopio, ran through the plain of Poggiomarino and flowed to the sea. The opportunity to build in an area next to the sea, mills and pasta factories, marks deeply local economies. The industrial densification determines a significant impact on the built that is transformed with massive dislocations of people, homes, industries networking infrastructure and services. Small-scale productions affect this site, not only with respect to the evolution of the social and economic texture, but above all with respect to its physical structure (Abenante, 2011).

The city of Torre Annunziata, as a whole, is especially devoted to the production process: streets and buildings, with their orientation and shape, are conceived for collective manufacturing. Since '600, low-rise buildings with warehouses and alleys turn, depending upon the needs of the manufacturing process for dry pasta food. There is a significant relapse in the sizing of the open spaces dictated by the need to dry the pasta on the outside, along the sidewalk where the barrels can be placed for long formats. Streets are wide, with deep sidewalks exposed to the south; plazas and squares are designed to accommodate sun and winds. Built spaces are thought to balance productive requirements and commercial activities. Buildings have spacious hallways and staircases that connect homes, terraces and balconies for completing the semi-finished product processing.

Over the course of three centuries, progressive adaptations sign the built and accompany the creation of a fragile entrepreneurship from a community repository of manual skills. Technology supports and encourages this growth, first through the development of constructive logics for spatial elements in which the drying is rapid and controlled (roofs, halls ...), then with the integration, inside the buildings of machines for mechanizing processes.

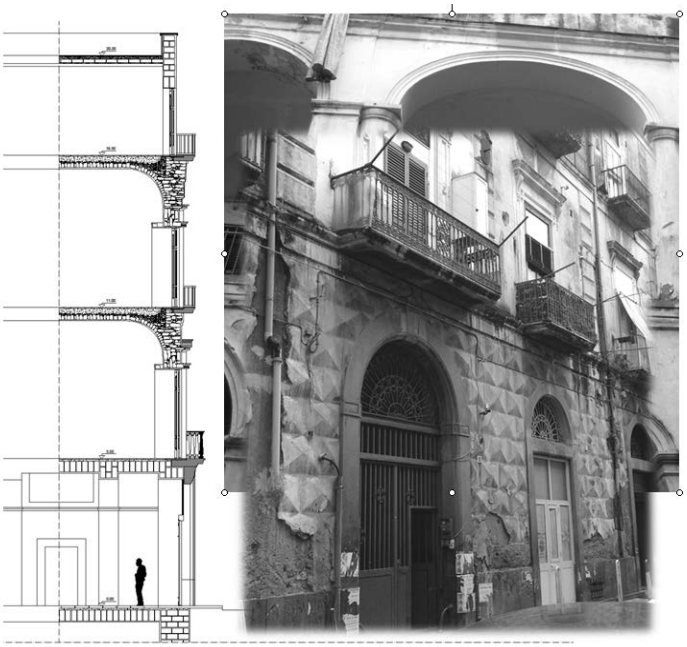


Image 2: Constructive characterization of Torre Annunziata

Aim of this first phase of the study is the systematization of knowledge. The experimental research started in Torre Annunziata, puts in place procedures to organize constructive and productive data related to the settlement. A systemic vision connotes the approach, based on the theoretical decomposition and analysis of performances. Specific object of investigations is the area to the east, just below the ancient Oplonti, the quadrilateral formed by Via Oplonti, Corso Vittorio Emanuele, Via Mazzini, Via Murat.

An anagraphic registry of the built is here introduced to collect and systematize data on buildings and roads; the cards for each of them, show the systematization of environmental units and technical elements, comparing past performances with occurring pressures and shocks. An integrated interpretation of the cards, returns off the pressures induced at the same time on the settlement and manufacturing system. In the second half of the nineteenth century, several technological innovations penetrate the market, determining its first significant transformation. In 1870, machinery cylinders spread. They are imported by the firm Ganz of Budapest, and are able to reduce manufacturing wastes. In 1888, Torre Annunziata offers 213 pasta factories. At the beginning of the '900, the mechanization of production processes, leads to changes in quality, with significant acceleration of the process. It is closely dependent on imports of durum wheat from abroad. In this historical moment, the productive vocation in the settlements can mark

the urban settlement, as documented by the realization of several buildings specifically intended for manufacturing. The production, holding only within the factories, permanently disconnects from the site that no longer assumes the function of catalyst for the product.

The beginning of the First World War is a time of decline. War requirements and irregularity of supply are at the origin of the closure of many large plants and the return to small family-run factories. During the Fascist period, the pasta manufacturing finally, loses importance. After second world war, due to the obsolescence of technological and production processes, factories are emptied of equipment, and only host residential functions. The administrative backwardness and lack of a constant adjustment to production techniques are a significant factor with respect to the disposal process of production.

On a technological level, the event that finally cancels this great economic adventure, is the realization of continuous machines able to eradicate the production from the site and microclimate. Such a radical change affects permanently Torre Annunziata. All the specificity of a product that had deep roots in the area and had become a constituent part of a built environment unique and special, disappears. The decline in industrial productivity and the advent of a service economy, in recent times, has a disruptive impact on previous processes, with very evident imbalance between identity and new vocations. At the beginning of the twentieth century, uncontrolled anthropogenic and natural pressures induce the final detachment, between techniques and settlements. Materials, devices, specific solutions, take over on an overall vision, gained thanks to cultural continuity. The constant interactions between spatial structure and settlement production as apparently solid and reflected in the characteristics and distribution of local product, are fragile in the presence of a radical change in techniques. The disruptive phenomenon of disposal for productive activities, in Torre Annunziata, within a few years starting in '39, disrupts the functional, environmental and structural concepts. If on a physical point of view, the presence of abandoned buildings for grain processing and pasta production in the centre of the city, legitimates operations of conversion for residential purposes, on the economic level, the disappearance of a productive opportunity profoundly marks the social. The pasta factories become, in many cases, private residences and overall the town loses its memory of a vocation founded on interactions between open and closed spaces, public and private.

3. Outlining vulnerabilities: the processes of technological misalignment

The second part of the study focuses on built environments' vulnerability, tracing it back to slow and often unconscious processes of de contextualization and hybridization of construction solutions (Miller et al., 2010). Nonlinear degradation and obsolescence processes connote their intensification. Past synergies between spaces and design, technology and society, are denied by the name of an economic growth.

According to the UNI 10838: 1999, the *functional- spatial concept* is assumed as the structured set of spaces defined by their functions, sizes, morphologies, positions also related with the external areas. The constructive concept refers to the general principle that regulates buildings' attitude to withstand stresses of multiple nature and intensity, always being accessible to users. It concerns the constructive logic, in relation to dimensions, materials, technical solutions for elements. Similarly, the environmental concept is the general principle that regulates the interaction between heat, sound and light flows, investing and permeating the built. The experience started in Torre Annunziata, pays particular attention to the relationship between technology, place and time. With the increase in the capacity of technical control of contexts, the demand for products and the consequent depletion of resources, the settlement system, tends to change. The slow process that guaranteed the morphology, distribution, construction, continuity for centuries, is influenced by extraneous cultures. Several buildings, once, harmoniously inserted in the plots of the landscape, show significant changes in the structural behaviour as a result of enlargements, the creation of new openings, the removal of typical vaulted. In the framework of several differentiated solutions (by virtue of the historical and constructive development) the built is characterized by the prevalence of bearing walls. The constructive concept is common to the whole settlement. The period of construction and the economic availability of the customer impact on the extension, on the number and size of the openings, on the presence of external projections, on the quality of the finishes. Even in large buildings or in cases of special care for finishes, as in the case Opificio Orsini, the built responds to functional, structural and environmental logics, shared by all the building texture.

On the functional-spatial perspective, two processes of opposite nature expose the settlement system to uncontrolled transformations: the connection between adjacent vaulted spaces, with the elimination of some structures by inserting arcs; then later, the next, splitting of the rooms (Image 2). The first transformation is due to the demands of technological innovation and to the introduction of new machineries within the production sites. The environmental units dilate, varying the proportional relationships between

the technical elements that compose them. The first thirty years of the nineteenth century are a critical period: the great inventions developed individually at the end of '700 tend to converge. Even the production site of Torre Annunziata to an economy based on wooden, supports and replaces one based on coal and iron. The site plan, originally characterized by rooms of large longitudinal dimension, is upset with the gradual release of the spans from the intermediate structure and the connection between spaces originally responsible for different stages of the production process. These transformations tend to deny the characteristic succession of areas designed to accommodate the productive function: the laboratories that hosted activities of kneading dough of durum wheat with warm water, drafting of the pastry, cut the dough, the spaces of sale, the spaces of accumulation for semolina and wheat, the outdoor spaces for the drying of the pasta, the spaces of the packaging and wrapping.

Image 3: Functional and spatial transformations

The examination of the built in terms of climate control, reveals the incidence in organization and distribution, taken over the centuries, by climate, temperature, relative humidity, solar-radiation wind, rain. As characterized by a poor economy both in terms of material resources and constructive solutions, the settlement of Torre Annunziata is characterized by the ability to make the most of the potential offered by the environmental position in the Gulf of Naples. The location of the city itself in a protected position, with respect to the Vesuvius, directly affects the climate: prolonged

serenity and brightness of the sky, temperate climate with little violent disturbances, high summer temperatures, the prevalence of a moderating sea, diurnal variation of temperatures. The alternation between offshore winds and sea breezes conditions the site. The closing of the windows in the basement of the buildings (oculi), the replacement of external doors, the upper closure of the stairwells, the saturation of the voids in the gardens, completely alters the microclimate regime of each building and of the whole settlement (Image 3).

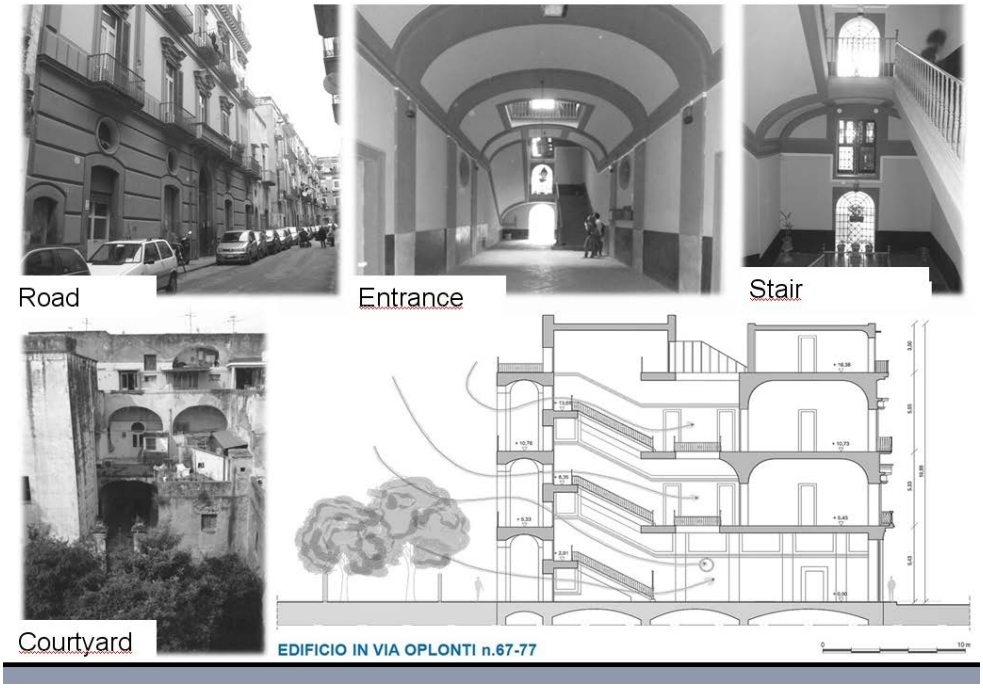


Image 4: Environmental transformation

A nonlinear evolution connotes the intensification of the built environment vulnerability, particularly exposed to increased chained negative reactions. The spatial and environmental exposure to risks is powered by:

- a radical misalignment of spatial, structural and environmental characteristics, compared to manufacturing and residential functions,
- a progressive loss of consolidated dialogue between built and settlement,
- a sudden loss of cultural sensitivity towards the maintenance of structural elements and finishes,
- a lowering the technical capacity of the workers,

- an unpredictable loss of memory of the role and performance of spatial elements even in their finishes to the definition of the complex building system.

4. Recovery pathways

The old continent, the incubator of the birth of the secondary sector, is now the orphan of many niche productions, once capable of an economic boost. Several researches open today to the need of bringing back to life, manufacturing activities, as protagonists of economic and social developments. Suggestions for the third phase of the study, throughout development, could be extracted taking care of the synergies already defined between material culture, spaces and economies.

Researches and practical experiences in ancient settlements, converge today in identifying built environment recovery as complex knowledge-based processes, aimed at driving both past and future transitions. Protecting identity and answering to users' needs, recovery requires long-term vision, multiple domains and different actors, supporting changes in culture, structure and practices (Viola , 2012). The crisis forces us "to walk, looking back", understanding where we went wrong over the past, if we want to get into the future. In this view, the disciplines, connected with built environment recovery, can be conceived as essential to return specificity to local products, in relation to their previous places of realization, without falling back into mistakes of resources' exploitation.

In recent years, more and more studies have been focusing on the power of transitions, for built environment enhancement (Grin et al., 2010; Markard et al., 2012). When referred to future growth, transitions have been assumed as processes of change involving culture, structure and practices. Moving the disciplinary focus on the recovery to transition processes, could contribute to heal the gaps often evident among instances of protection - documents, values, resources- and users' requirements.

The future of an ancient city, is related to the ability to reinvent spaces and devices, with the re-design of technologies, able to fit within a built system with high prior degrees of stiffness, imagining working procedures, operators, and times. This approach brings into play an idea of the settlement as an interconnected productive system. Information technologies, in particular, can support the definition of design scenarios. According to a vision that relates value chains, niche products, built environments, the foreshadowing of transition processes for recovery, focuses on three levels of drivers: 1. location, 2. spaces, 3. technologies.

1. In traditional manufacturing enterprises, the location has always been a factor whose influence was clearly understandable, due to the presence of resources or infrastructures. The post-industrial economy, based on

knowledge and innovation, shows today an inherent capacity to overcome these logistical constraints. In the new economy of innovation, the success of enterprises and a cities exceeds the proximities and depends on relations. The definition of recovery drivers is therefore based on an assumption increasingly shared in times of crisis: element connoting the productive vocation of a place is not the single architectural building, but the settlement, as a whole where multiple skills and abilities interact in productive activities. A cloud manufacturing model applied to the food industry is here supposed to be able to dramatically reduce the need for transport in the food chain with a very limited impact on environment. The scenario of de - industrialization, de- standardization, prefigured in the mid-80s thanks to the potential of the network, could be today implemented in Torre Annunziata through the distribution of micro manufacturing plants, focusing on the transport of information rather than goods.

2. Referring to spatial issues, recovery drivers can be defined understanding the performances of spaces (private and common) and taking into account morphologies, dimensions, materials, and uses. New demands are reshaping today spaces devoted to production: security and health, accessibility, integrability for devices and remote systems, durability. Progress and globalization are setting the type of space for the production of goods, the modes and the place where they are produced. The characters and the demands of the working world are reshaping the configuration of our living spaces according to long – term dynamics. Key issue for the future of productive landscapes is the realignment of existing spaces and processes put in place. In traditional manufacturing firms, the location is a factor due to physical characteristics of the settlement, as the presence of a port or of natural resources. In the case of new technology, the existing spaces with their performance can become mediators to future jobs.

3. Referring to technological issues, the definition of the drivers takes into account the fact that manufacturing, for three thousand years underwent periodic transformations that had a huge impact on the way in which culture evolved. Today, the art of transforming materials to create new products and meet new needs, is undergoing a deep hybridization. The penetration of a new technological thinking is related to the flexibility of the components with which the city is equipped for the transition to new models. The issue of flexibility is one of the areas of greatest innovation in response to changing needs. The contemporary operational practice is generally not prone to change and quite careless with respect to evolutionary dynamics affecting everyday life. The challenge of flexibility is the ability to anticipate these changes and metabolizes in the design process, providing a reasonable rate of transformation over time, while preserving the values of the city.

An imbalance between growing demand for innovation and available solutions, marks the scenario in which Torre Annunziata, today opens to meet the sustainability issues, through concrete actions, aimed at a conscious use of local resources. The two forces that decimated the manufacturing industry - globalization and technological progress – could today drive the expansion of new jobs in the field of innovation. As for the past, creativity is supposed to be able to redesign local economies with the support of tools and procedures deduced from an advanced manufacturing.

Conclusion:

The idea that the urban landscape can be considered as the wealth of nations is recent. In 2000 the European Landscape Convention, sets out a vision of enlargement for the management of the landscape with respect to the assumptions proposed by the Charter of Gubbio that at the beginning of the '60s in the evaluation of the aesthetic and cultural heritage hitherto, cultivated by art historians, had introduced the physical component. Linking the definition of areas to people's perception, as *the result of the action and interaction of natural and/or human factors*, the scientific community first, highlights the need of developing specific measures to foster the engagement of populations in decision-making processes. Despite the introduction of a perspective that promotes awareness-raising and training for urban landscape management, the scientific community acknowledges that the application of the European directives today runs the risk of inconsistency between a system of landscape management and protection, based on constraints and new development requests moved by users. New approaches should be put in place, moving from an awareness of the need for innovation to ensure preservation. Designing the relationship between the physical system, the social and economic condition is essential to manage urban landscape over time, making it sustainable.

Filling the gap between sites and users, is the result of this research, that relates the physical characters of landscapes to their production attitudes. The identity of the production is linked to the territorial sedimented values, in a perspective that reconnects lost ties between built landscapes' physical dimensions with economies and societies. By focusing on the decomposed relationships of sites and users, the paper identifies technology, today as the main opportunity to rebalance new pressures due to an economy that in recent years, regardless of local characters, plundered natural resources. The ancient principle to use without consuming, supports the definition of design drivers for the next millennium. They can stop dissipative processes, and stimulate future scenarios, integrating physical, natural, economic and social components. As stated in the Unesco Recommendations for Historic Urban Landscape, the research reaches the goal to outline future developments for

a productive settlement, combining knowledge and design tools, adapted to local contexts.

The outputs open to the creation of a relationship between manufacturing traditions and people perceptions, focusing on a conscious interaction between material and immaterial values to drive the change. The socio-economic political crises, affecting our world, shift nowadays, the scientific community attention on the need to give urban landscape the role of leading carrier. With the help of a co-evolutionary vision for the relationship between sites and societies, architectural technology becomes a regenerator engine for degraded contexts. Redesigning the commitment for architectural technology, is the outcome of the study, which opens to the promotion of development drivers, linking spaces to communities, betting on the possibility of shifting the balance between the transition processes. Under this perspective, *the power of technology is supposed to be linked to the power of the people who use and benefit from that technology.* Return to technology the potential to accompany proactively relations between society and landscapes today means to promote an awareness of the integrability limits for technologies within the built. The rebalancing of the decomposed pressures can be solved in a new production infrastructure, designed from the bottom, able to directly involve people. In this perspective, landscape itself is the driving force behind the strategy of recovery and maintenance, the physical medium through which the set of actions designed to qualify a new presence on the market con be developed.

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