

# Abandoned urban areas, origins and new guidelines for their regeneration

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## Abstract

In recent times the concept of a city is changing to acquire the value of a system of services linked by a network of infrastructures, not a simple settlement system, but an organized system of functions where the relationships between people, information and things become a priority. The housing decentralization and the deindustrialization have often caused an archipelago of empty urban abandoned spaces that, although belonging to the city, are no longer part of it, deprived of any form of use, are waiting for a reassignment of a role. For these areas it is indispensable to identify new potentials and modes of intervention that trigger a regeneration process and which can play a crucial role in a process that allows to pass from the marginal area to infrastructure of the system of relations between the city and neighboring urbanization, hinge of a new identity of the city.

Keywords: Abandoned urban areas, Decentralization, Deindustrialization

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## Introduction

Our cities have often born as centers of commerce or trade nodes and have assumed their specific identities and skills in relation to the territory they administer or serve, becoming a place equipped with services through which they focus or condense trade opportunities of goods and information. Thus, the concept of a city transcends both the vision of a built-up and circumscribed space, as well as of an unlimited space to acquire the value of a system of services linked by a network of infrastructures that allow it to operate. Hence, not a physical entity or a simple settlement system, but, above all, an organized system of functions, within which the relationships between people, information and things become a priority. In pre-industrial times, urban systems have grown along the arteries that penetrate the territory, with a road layout arranged according to the natural morphology of the place. The inhabited centers, however, retained their size in terms of exchanges and shifts. Industrialization, resulting in massive urban turmoil<sup>1</sup>, resulted in settlements in the cities around which production poles had developed. In the advanced stage of industrialization, the construction of urban means of transport has allowed indefinite growth of the cities that invaded the territory as a metastasis, creating the phenomenon of the suburb of the settlement system which, still today, is damaged in terms of invisibility, loss of identity and marginalization of residents.

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<sup>1</sup> The factories were located in the same urban areas or adjacent to them (proximity to the city with its logistics was necessary both for the procurement of raw materials and for the workforce and as a commercial outlet).

## Transformations of the current urban scenario

In the last decades, there has been a diversification of the phenomenon. The life models, behaviors, and alternatives offered by the great city (services, work opportunities, cultural activities, etc.) are also extended to smaller centers, due to their uniformity or homogenization, induced by mass media, low-cost housing, decentralization of commercial and administrative districts and the inability of the big city to provide a sufficient quality of life; all these factors can make the city's abandonment phenomenon more understandable so to fuel housing decentralization in neighboring homes that become satellite nucleus with its own autonomy. Moreover, the deindustrialization of our occidental societies, subverting the usual principles of business location, often caused their transfer by producing new urban scenarios. The industrial areas where once the hard work reigned, now, after missed the productive activities, turn into factories and closed warehouses; manufacturing buildings are demolished and leave empty spaces, rarefied, timeless where the pioneer vegetation takes over. At the same time, in the urban development of the city and surrounding, the general rule of settlements area was overwritten by strong distortions generated by widespread abusive works and by delocalization interventions, implemented to decongest urban centers, and by equipment, services and infrastructure. This conurbation, a system in which it is difficult to identify the boundaries between the inhabited area and the countryside, is distinguished by the alternation of areas of different characterization:

- areas where an intensive residence has developed, with casual and point-like interventions, and low-density housing areas;
- areas reserved for commercial activities
- areas where are large multifunctional complexes (cinema, hotel building, etc.) and business districts (business districts)
- areas where are sports complexes and multifunctional centers.

In this complex scenario, the large urban centers and their metropolitan areas have dense nucleus, which correspond to different historical centers and a conurbation, only at times discontinuous, which gravitates on it. The boundaries between the dwellings are no longer constituted by a line of cessation, but by a wide transition band, corresponding to an area where the urban elements gradually leave, even today, the place for the rural environment that remains often like scraps, land wreck, insinuated among condominiums, sheds, streets and uncontrolled dumps. Between the urban center and the wide suburb band, a belt has been created where discontinuity prevails, a critical area of indefinite elements where the functions are dissolved and weakened, the spaces that host them are employed with decreasing intensity. An archipelago of empty urban spaces that in the suburb regions adds up to the remaining rural areas, deployed in a maze of landslides between the settlements and the swarm of new tertiary settlements; abandoned spaces that, although belonging to the city, are no longer part of it, deprived of any form of use, are waiting for a reassignment of a role. These indefinite areas within the urban trajectory, on the periphery of the dwelling or on the margins thereof, can be identified, depending on their type, in residues or abandoned.

In particular it is possible to identify:

- small areas, insufficient to render it any productive use, often of irregular shape, the result of the overlapping of urbanization works (failure to complete or backfire in building enclosures, crossings or limits of road axes, etc.);
- areas of relevance to companies, held for possible expansion or relocation, land acquired and not used for speculative purposes, areas identified for the development and expansion of public infrastructures;

- areas subject to archeological, military or otherwise expropriated and non-functional constraints. These areas, lost the function to which they were destined, and before they accommodate others, live in a functional freezing condition. Unlike the residual areas<sup>2</sup>, which often have a different degree of naturalness, they are strongly transformed by men, free from any equipment or artifacts, or almost entirely occupied by structures. They are areas in which the function or multiple functions, to which they were intended, have been alienated by technical or functional reasons (abandoned areas of industrial or commercial facilities, abandoned railway lines, spaces once dedicated to special functions, services, military sections etc.). For these areas, which are confronted with a new and larger territorial reality, it is indispensable to identify new potentials and modes of intervention that trigger a regeneration process and which can play a crucial role in a process that allows to pass from the marginal area to infrastructure of the system of relations between the city and neighboring urbanization, hinge of a new identity of the city. Relationships areas therefore play an essential role in the process of regeneration of the city towards a new identity which is no longer recognized in the proximity of many centers but in the mutual function of each other, therefore strongly affecting the whole system of connections such as synapses of the system urban areas, dialogues, exchange opportunities, multi-cultural places, new symbols to promote a city to a metropolitan character. The design of the relationship spaces and abandoned areas will have to play the role of ordering and safeguarding the identity of the city. Therefore, we must analyze the changes currently taking place in the conception of the meaning of the collective space which, unfortunately, increasingly identifies with places such as shopping malls, amusement parks, historic tourist centers, where relationships are often contingent to a space organized primarily for commercial purposes or, with similar logic, resolved as author's projects, ineffective compositional exercises and not meeting the real needs of users. Attempts to create relationships and exchanges places have produced spaces without identity, urban voids that have failed to assume roles or even symbolic values, which were rejected by those to whom they were destined. In particular, this has occurred in peripheral conurbations where the very idea of public space is absent or often is intended as a simple functional space, which totally invalidates the complexity of social relations, pushing to annihilate the ways of living the city.

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### The potentialities of abandoned areas for urban regeneration

In this context, technological research faces a new sphere where the theme of urban regeneration requires multidisciplinary inputs that include the themes of strategic planning, social relations, environmental impact control, and sense of belonging to places, a context where urban resilience is adequately weighed so that the urban system can absorb adjustment actions without distorting it. It then seems appropriate to refer to the concept of urban bioregion as a territorial sphere where the economic components of the local system, the political, environmental (territorial ecosystem) and living (functional system) components pursue a co-evolutionary balance by reestablishing new forms of long-term relationships between city and country to territorial equity. Regionalism, already theorized in the 1980s, and devoted to the protection of diversity as a source of wealth in the Italian territory so intensely transformed by the action of men for centuries, hoped for a project of the territory in continuity with tradition, where continuity means not the mere formal restore of archetypes but the elaboration of technologies specifically developed to adapt to local needs, favoring

<sup>2</sup> Residual areas, large spaces or small land shred, have been the result of changes in the city's timeframe. They may have retained the natural layout for reasons of a physical or administrative nature. They are often interstitial spaces of constructed fabric, no longer built terrain, areas awaiting development.

rational development of land-related technology, reconsideration of resources locally available, with a view to "new constructiveness" for meeting contemporary needs.

The concept of bioregion is not strictly a concept of homogeneous or simply geographic homogeneity; it is based on the recognition of territorial units, with homogeneous characteristics (climate, soils, plant species, human cultures) where conscious and moderate use of technology is required while respecting of the natural and cultural environment; a profound change in the perception of our role in the ecosystem. This conversion must begin from the reposess of the places where you lives, rediscover its meanings, exchanges, boundaries, activities and forms of culture created by the bioregion, affirming the principle that every organization of life has the sole, unique value in the relationship with the places, which gradually goes down in favor of a quality of globalized life that produces ephemeral well-being while at the same time increasing the region's impoverishment and social marginalization. The methodology approach to urban bioregion requires the redefinition of the constituent elements of the territorial project both in the normative instruments and in the definition of models to which they tend: these elements are relevant both to the needs and the creative and operational fields of human activities (*necessitas, commoditas and concinnitas* for Alberti), both to the objects built (the vitruvian categories of *firmitas, utilitas and venustas*). In both cases, the relationship between the components allows, for each of them, assessments and design choices that do not conflict with each other, or indeed constitute synergies for the integrated project. The requirements expressed by the categories of Alberti and Vitruvio, referring to the activities and constructive elements, can be extended to the territorial issues: to the ecological balance and the environmental quality of the urban spaces in terms of *firmitas* and *necessitas* that is the adequacy to satisfy the solidity requirements of the settlement system and the guarantee of urban functions; to the quality of living as *utilitas* and *commoditas* which mean the ability to adequately support urban functions, their evolution over time and the changing of territorial balances over non-urban areas; to the perceptual quality of spaces, *venustas* and *concinnitas*, linked to the identity of places, the sense of belonging and the integration between man and the environment. In the constructive lexicon of the bioregion we can recognize a main structure made up of elements of a socio-cultural, political, environmental, productive, urbanistic, landscaping nature that form the territory as a built system of parties made of rules and relations between the different entities that make up. Therefore, the urban bioregion is the basis of the local cultures, the system of settlements, the networks between cities and between countryside and cities, the productive and energy resources, and the forms of local government and social self-government. The meaning of urban regeneration is interpreted according to different schools of thought, Jones and Evans (2008) define it as "a large-scale adaptation process of patrimony built in different directions and different entities"; Turok (2005) identified three distinctive features of urban regeneration: the purpose of changing the nature of a place and involving the community and other actors in the process; the understanding of different objectives and activities depending on the particular problems and potential of the site; the involvement of a partnership between the various stakeholders. Referring to people, the regeneration aims to improve their skills and aspirations to enable them to participate and benefit from opportunities; regeneration is also aimed at improving economic competitiveness to create more jobs and well-being and the overall attractiveness of a place to attract both people and businesses. The strategy is to find a balance between all three elements to ensure that a resumption of a territory is long-term and sustainable. Urban regeneration is therefore not a process oriented to mere physical redevelopment and to the redefinition of the urban image, but it must be intended as a deeper and deeper act, which wants to affect the form and substance of the urban space, triggering processes of self -qualification on wide

scale; it implies a real phase of approaching the inhabitants, in order to learn their habits and expectations to implement recovery from the inside; the physical redevelopment of urban space must be the final product described by the citizen and realized through the guidance and support of the technicians. Urban regeneration aims to optimize the existing heritage, to renew it by upgrading the city to comply the requirements of environmental protection, energy saving, smart mobility and, above all, through a careful governance process which ensures that transformations are consistent with the needs expressed by the users and that they are involved throughout all this process.

## The tools of urban regeneration

The redesign of the relationship spaces and the regeneration of the free areas must begin from the identification of the new role that they are going to assume, and from the attribution of specificities such as to form a flywheel or condensation poles in the revitalization of peripheral areas. We can identify in the development of interstitial areas a strategic tool for controlling the dynamics of harmonization and balance of territory, transforming margin areas into connection areas; areas in which to invest in achieving environmental re-qualification targets for the entire city. It will be, or will must be, a complex process due to the economic and social disparities of the contexts involved, and therefore the resulting commitments cannot be assumed by individual local governments without the direct involvement and active participation of resident communities. Participation of citizens living or working in the areas affected by redevelopment is necessary for a correct reading and interpretation of the existing resources, but also to prevent that market logic prevail in the definition of urban projects. Identifying the needs of territorial provision for a qualitatively sufficient response to the needs of residents is a prerequisite for effective negotiation between administrations and citizens in the process of reclaiming disused areas. Although urban redevelopment is not a new issue, over the last twenty years it has taken on different connotations for the size and complexity of interventions; particularly interesting are the large areas to be refurbished, but more attention is being paid to the small and medium-sized abandoned areas located in urban and suburb areas. The experiences on the large abandoned areas have shown that these projects are heavily financially affected, and are also heavily penalized by the costs and the times of environmental reclamation; in the face of these types of intervention, that are often ineffective for the purpose of capillary urban regeneration, you has developed a sense of regeneration of urban spaces of much smaller size, though economically unattractive, they are useful to realize punctual interventions with few resources and to revitalize the weak urban spaces. Along with the large-scale projects, some new approaches are taking on for urban regeneration by pointing to the small scale; you refer to the actions of spontaneous re-occupation, or not, of unused spaces, to the construction of urban gardens and vegetable gardens, to the temporary outfitting in residual spaces for public events; all these approaches are difficult to classify because each one of them can be unique as it is the product of a very specific local reality both architecturally and urban and socially, but however they are the spontaneous response to the global crisis, to the lack of resources and to the increasingly shared rethinking on minimal recovery strategies. Studies of a such large scenario invest urban areas characterized by highly differentiated social and economic realities and represent a commitment of such importance that they can not be assumed without the involvement of local governments and the participation of community residents. Samples and pilot projects can be proposed for each sector and thematic in order to find solutions that must be confronted with the current conditions of deep decay that affect the historic centers and require urgent environmental rehabilitation for the built system and for the external spaces of

transition and relationship, through a process of gradual recovery with intervention strategies aimed at:

- interventions on the built system;
- environmental rehabilitation through the construction of disposal and recovery systems for waste water and the revision of the waste disposal system;
- restoration of safety and welfare conditions with a progressive lightening of the construction fabric, carried out through appropriate vertical thinning and demolition of those crumbling buildings, without any value from the historical and architectural point of view;
- conservation of architectural heritage of particular historical and environmental interest and valorization of the buildings that characterize the housing tissue.

The disordered city, widespread on the territory with a myriad of constructions and infrastructures must build its identity by mending a torn urban texture and by structuring a program of redevelopment of free or abandoned areas where, in a logic of sustainability, you can devise services and public functions. This gradual recovery process, firstly, through studies and projects in sample areas can provide pilot solutions to replicate in all free areas and public spaces requiring urgent environmental rehabilitation efforts. Reconversion of most of these urban spaces into green areas may seem like an economically improper operation, nevertheless the economic revaluation of neighboring areas and the recycling of these properties for different and productive uses reduce the expansion and destruction of valuable green areas, with the conservation of ecosystems, of natural resources and with the protection of local environmental quality. Particularly in peripheral areas, characterized by a low density and mostly residential use, with strong ownership fragmentation, it is necessary to plan urban tools that will allow to identify those intervention modalities of redevelopment to be agreed with residents and owners of real estate, by intervening on volumes, heights, exposure of buildings and on the quality and accessibility of private open spaces. A parallel intervention program will have to target the quality of public space, internal local services that are to be redistributed within the interstitial arena. In today's large and complex territorial realities, , a program of interventions aimed at merging the various specificities is needed more than just one project; new intervention strategies must be built to trigger a global regeneration process. In this scenario a key role can be assumed by residual urban areas and discontinuous areas, almost always on the edge of the inhabited areas, today potentially hinges between them. Identifying the needs of territorial provision for a qualitatively sufficient response to the needs of residents is a prerequisite for effective negotiation between administrations and citizens in the process of redevelopment. To control and design the dynamics of managing these areas, it is necessary to identify their potentialities through a highly articulated analysis and through an interdisciplinary study program at different levels of depth: for the different territorial realities, for the ways of developing the urban organism, for the settlements morphology and the different architectural typologies of constructed systems and, above all, the level of integration between them in relation to the different modes of fruition. Public space, in fact, takes on its meaning because of the functions of the environment around it, so each study must be compared to users who populate the area and to their mode (time and type of activity) of using it. In this program, it will be essential to calibrate the services and equipment in their respective areas with their respective buffer of influence in order to identify the type of users and the frequency of use of the analyzed area in order to ensure: the permanence of tertiary structures, the introduction of services and equipment, the introduction of public green spaces and spaces intended for associative forms and the management of nodes (intermodal interchange systems) and the physical connection networks

(creating ecological corridors) and virtual networks between the various areas of the city. Projects need to be provided that:

- introduce services and equipment;
- reinstate of administrative and managerial functions for the recovery of urban area functionality;
- guarantee the permanence of traditional commercial and productive structures;
- create public green and spaces intended for associative forms;
- reflect the culture or history and character of the local community
- give the sense of belonging to the place and encouraging communication and relationships among strangers;
- preserve the character of the place, the urban environment (peripheral district, business districts, historical center, etc.) and the rural environment (preservation of traditions linked to agricultural production with the inclusion of urban gardens);
- introduce attractors that enhance and encourage, in view of significant occupational implications, existing structures;
- ensure the safety, comfort and usability of all users including those with physical disabilities or with specific needs;
- provide connections with an appropriate urban mobility system;
- guarantee constant quality over time with a reduced maintenance forecast;
- can change for different uses (markets, shows, sports and cultural events, exhibitions, fairs, festivals, etc.);
- design spaces for representation with a specific iconographic value (redrawing thematic maps).

This complexity can not be translated into a single and unique formula, so it is necessary to adopt diversified design strategies in the various phases, distinguishing them by amplitude, timing, and way of managing the intervention process. In highly complex urban environments, administrations should give priority to intervention in small residual areas to hypothesize a first level of intervention as a pilot project, to be implemented in a short time, with which to carry out continuous monitoring that would enable the definition of guidelines for the regulation of interventions. These should be considered as a monitoring and orientation tool for the development of future projects and to evaluate their impact on the identity of the sites and their integration with the local development dynamics. Short implementation times involve choices that need to be flexible so that they can be modified and adapted to any unforeseen needs.

### Design participated as a guarantee of the process

In inclusive decision-making, however, administrations often face great difficulties; the strength will be the management of the design process with the participation of end users; no more passive recipients of public administration intervention but a fundamental resource. Thus the delegation to the technician called to interpret the needs of the user is exceeded.

In fact, the community participatory design is based on a different mode of dialogue between the designer and the inhabitants which prevents pre-established solutions from administrators for speculative purposes. Too often in the urban environment, utopias are projected that are less adherent to the specific needs; this gives rise to discontent, loss of sense of belonging to the places and "corrective" abusive interventions that are very far from the great speculations while they are the simple expression of fundamental needs ignored. The involvement of the inhabitants, by overcoming

the relationship between administrators and citizens<sup>3</sup>, and if carried out with seriousness, can produce surprising results not only because it allows the real instances of the inhabitants to be accepted in the project, but because it changes the relationship of society with the place, it exalts the sense of care and belonging both to its private goods, to those of others and to public goods. The mode of involvement of users is a flexible method that triggers a process of empowering citizens and appropriating of those actions useful in addressing decisions, developing interventions, and solving problems. Users can be involved in ways that can be distinguished in a direct inclusive approach or in a more traditional indirect, with a comparison that is anyway aimed at activating dynamics within a social group helping it to make a shared decision. In these process, has a key role the one who deals with the communication process and transmit to the participants, by the way of a strong involvement, the opportunity to dialogue, to improve communication, to build strategic plans and to resolve deliberative problems. Various procedures implemented through a public debate can be adopted to promote participatory planning - in which a committee open a public debate<sup>4</sup> on preliminary infrastructure projects intended to have a major impact on society and the territory, it carries out an action of information to the involved people, opens a discussion not only of the characteristics of the project but also of the opportunity of a specific design, at the end of the comparison the committee expresses an opinion on whether or not to carry out the work or how to do it. The information system is conducted through the listening of individual citizens and associated groups through interviews, questionnaires, brainstorming and now, through new technologies that have changed the way of involving and informing people, with instant messaging and social networks (Fig. 1). The interactive action is usually done by organizing thematic workshops, neighborhood labs, conferences, SWOT analysis and digital connection.

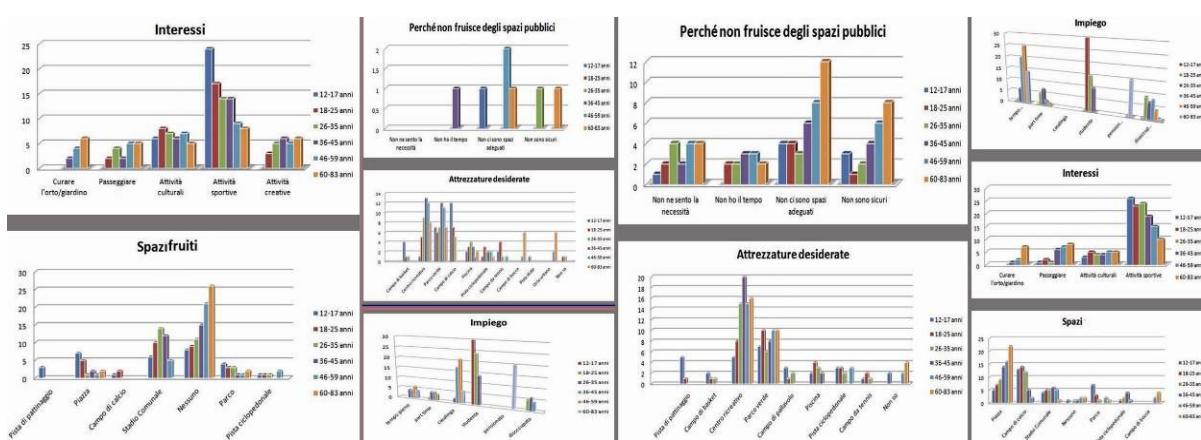


Figure 1 - Data from interviews with residents of Acerra (NA) for the upgrading of the ex-freight area.

For the last one, there are several digital platforms for the management of participatory meetings and workshops that offer powerful tools for managing telematic meetings. By virtual encounters, it is possible: to link individual participants or workgroups, view discussions<sup>5</sup>, facilitate sharing of results,

<sup>3</sup> To solve the problems of a complex society as ours, it is necessary that citizens are no longer passive recipients of public administration intervention, but rather that strategic participation in public choices is considered a strategic asset.

<sup>4</sup> Débat Publique was born in France with the Barnier Act of 1994, then amended in 2002, by which the Commission Nationale du Débat Public (CNDP) was established.

<sup>5</sup> Use the visual plan to make it easy to use information, share ideas and visions, and focus on the elements of agreement and the distinction between the participants.

and develop a shared vision. These procedures facilitate the creation of moments of confrontation, exchange and discussion, stimulating the ability to identify concrete solutions.

During its implementation, participants will have the opportunity to devise visions of the future of their community and to propose strategies to overcome the obstacles that they could encounter. The last participatory moment is the promotion of deliberative processes implemented through citizens' juries which make their results explicit through the organization of exhibitions of feasibility projects; by this way you can also allow the review and the correction of possible inadequacies and the check any possible forgotten parameter. The risk of these operating modes is, however, to make choices not sufficiently supported by actual needs of the final users. In fact, some solutions may be too orientated by those who are more involved in decision-making, leaving out so much of the users who, for distinct reasons, are excluded from the interlocutory and decision-making stages and are also part of the community. Particularly, in the planned design for the reuse of abandoned urban areas, the desires of the inhabitants who have elaborated and fantasized hypotheses on the use of the abandoned spaces in their neighborhood, focusing directly on verifying the feasibility of their ideas, often find it disillusioned their expectations. The possible failure of the participatory process is to be attributed to several factors: scarce power to the recipients, disregard of expectations, poor conflict management, dissatisfaction of the participants. The direct consequence of the failure will cause frustration among the participants, and any new proposal of involvement will most likely be rejected. A participatory design process has large margins of uncertainty that can compromise the achievement of positive effects on the territory. The success of any urban regeneration intervention requires that it carries itself into a flywheel for territorial and social development. Therefore, it is mainly important to adopt, in the rehabilitation of urban spaces, a methodology of interventions based on the collaborative approach, which is focused on real users, and which guarantees adherence to a new vision of a sustainable city. In this way, the phenomenon of self-generation is favored and it is possible to build or perpetuate that sociality which is still present in our centers. The urban regeneration project must be oriented at the community development, the social intervention strategy must be considered as the goal of the intervention itself (Martini, 2003). However, it is not sufficient to consider as community only those users who logically engage in a territory, but all those who, in a different way, use the area in question. Fundamental, therefore, is the choice of ways of involving the resident population, but also a cognitive investigation of the environmental reality in its physical and social sense.

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### The analysis methodology and the project for the abandoned areas

To control and design the dynamics of managing residual and abandoned areas, in an urban reality, it is necessary to identify the variety and the potentialities through a highly articulated analysis and the development of an interdisciplinary and multidisciplinary study program conducted at different levels of distinct in-depth study of the different territorial realities<sup>6</sup>.

The analysis of the anthropization of the intervention area cannot ignore the accurate control of all the factors of the natural configuration of the site and how these have affected the same process of adaptation carried out by residents. Environmental monitoring, carried out with instrumental investigations as well as studies of a historical-sociological nature, allows to detect the most intimate dynamics of the natural and artificial processes that have determined the current structure of the intervention area. The analytical procedure, developed in the didactic field, consider a first phase of

<sup>6</sup> Public space takes on meaning due to the functions of the built environment, so each study must be compared to users who populate the area and the mode (times and type of activity) they use.

direct observation of the investigated phenomena and a subsequent comparison of the data collected with the level of integration they achieve in relation to the different modes and types of fruition of the area.

When reading the urban system, they have been identified for the intervention area:

- characteristics of the natural configuration;
- geo-morphological aspects (altimetry, clinometry, geological and tectonic characteristics, etc.);
- landscape values (panoramic points, landscaping areas, optical targets, etc.);
- climatic elements (exposure and solar radiation, wind speed and direction, temperature and temperature hikes, hydrometeor and relative humidity, etc.);
- the character and quality of the vegetation and the typology of the green areas<sup>7</sup>, the floral and fauna's characteristics (indigenous and aloft species, habitat properties, etc.);
- the environmental risk factors (area seismicity, forest fires, hydrogeological disasters, etc.);
- the elements and factors of anthropization;
- the nature of the urban development;
- the settlements morphology;
- the aspects of artificial morphology, toponomy, architectural emergencies, etc.
- the architectural typologies of built systems and the constructive lexicon (building density, building typologies, traditional building materials and techniques, material, geometric, volumetric, chromatic characteristics, etc.);
- the environmental impact of infrastructures;
- the environmental degradation and sanitation (water supply and quality, sewage and refuse collection and treatment plants, chemical, acoustic, electromagnetic, etc.);
- the historical-cultural aspects (architectural emergencies, social context, historical stratifications, etc.);
- the environmental hazards in relation to the use of traditional or innovative materials.

The next analysis is conducted on the identification of the potential users of the studied area in relation to the type of users (social condition, age groups, gender, physical constitution, occupational condition, etc.) (Fig.2), to the activities normally carried out (temporary, working, leisure, recreational, sports, other) and to the number of users for time slot and seasonality.

The observation of the balance between the natural and artificial phenomena of the environmental system under a transformation and recovery has also been crucial for interpreting the results of the interviews with users and the demands of the resident community. In fact, the active participation of the community involved with interviews, neighborhood conferences, social networks, etc. give the opportunity to verify the degree of satisfaction of the needs of the users in relation to the services and equipment in the area and to list the requests emerged. In the next phase, it has been developed a framework that addresses the needs of: safety, well-being, usability, appearance, management, integrability, environmental protection, as laid down in *UNI standards 8290*, and finally decrypted as requirements for programming interventions (pre-design phase). In this study program, it was important to compare the data on the census of the services and equipment in the area under examination, the relative buffer of influence, the type of users and their mode and frequency of use.

<sup>7</sup> The processes to be evaluated relate essentially to the evolution of vegetation: from growth to development, seasonal variation of vegetation, and reforestation, soil consolidation through the use of naturalistic bioengineering techniques.

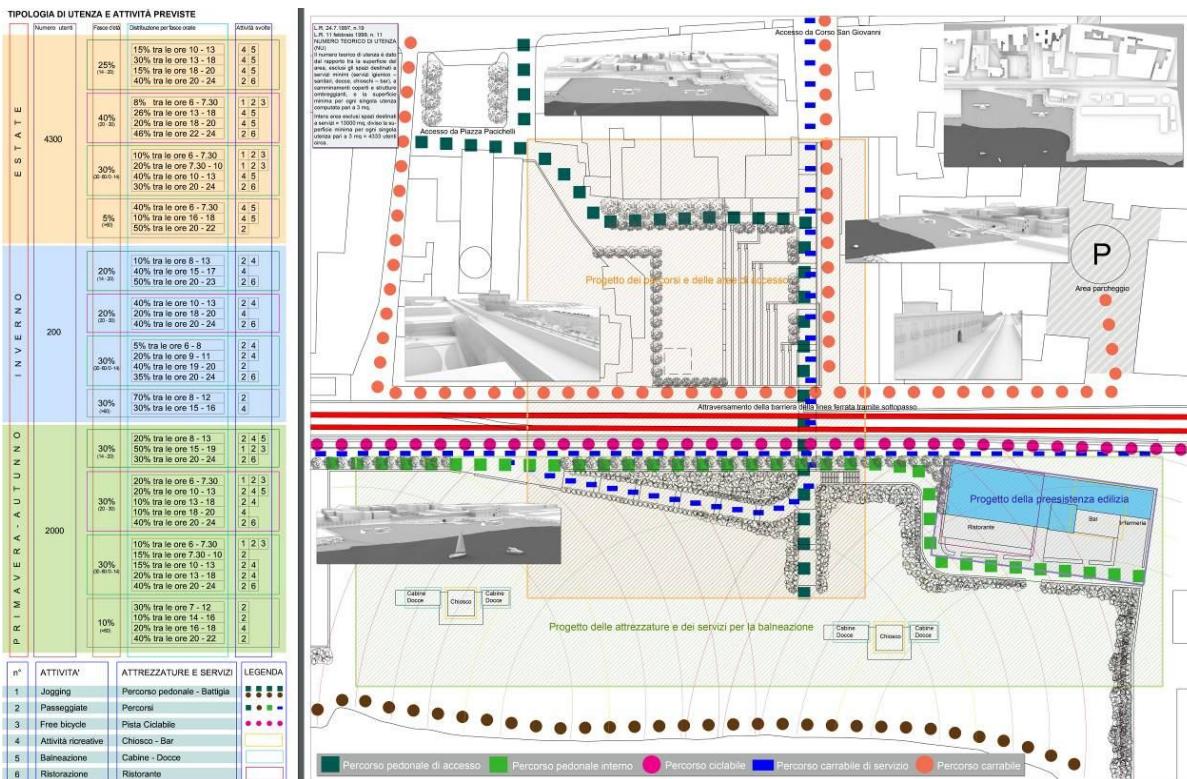


Figure 2 - Study of the activities and categories of users in the redevelopment project of the Boccaperti area in San Giovanni a Teduccio.

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Thus, in the project hypothesis, we tried to: resolve the conflict nodes between different uses, ensure the stay of tertiary structures or their integration (intermodal interchange systems), introduce new functions, realize large areas of greenery public spaces<sup>8</sup> and spaces for associative forms and, in particular, realizing a network of physical connections (creating ecological corridors) and virtual spaces between the different areas of the city (Fig.3). However, in the hypothesis of the meta-design phase of the transformation and rehabilitation of the area, the following are identified: the level of compatibility of modification with the environment, the intervention practices and appropriate technologies and forms of natural resource utilization (use of environmentally friendly materials that do not interfere, with a permanent or polluting nature, in the natural environment). The analysis and design methodology used in these studies is based on the search for intervention tools that are capable of modifying the performance of those environmental processes responsible for the degradation and de-qualification of the examined areas, and proposes an integrated approach between new functional and formal settings of the environment. Complex strategies, modulated in a sequence of operations and interventions, need to be developed over time, with the cooperation of the various stakeholders involved, activating synergy relationships with local authorities, productive forces and the community of inhabitants. Appropriate, punctual and targeted solutions, supplemented by an economic feasibility check, are a further guarantee for environmental sustainability research.

<sup>8</sup> A key aspect is the role of vegetation in the construction of the environment, a role that needs to be reaffirmed by complexity and richness, including functions such as air and water purification, summer cooling, wind protection , the consolidation of land, etc.

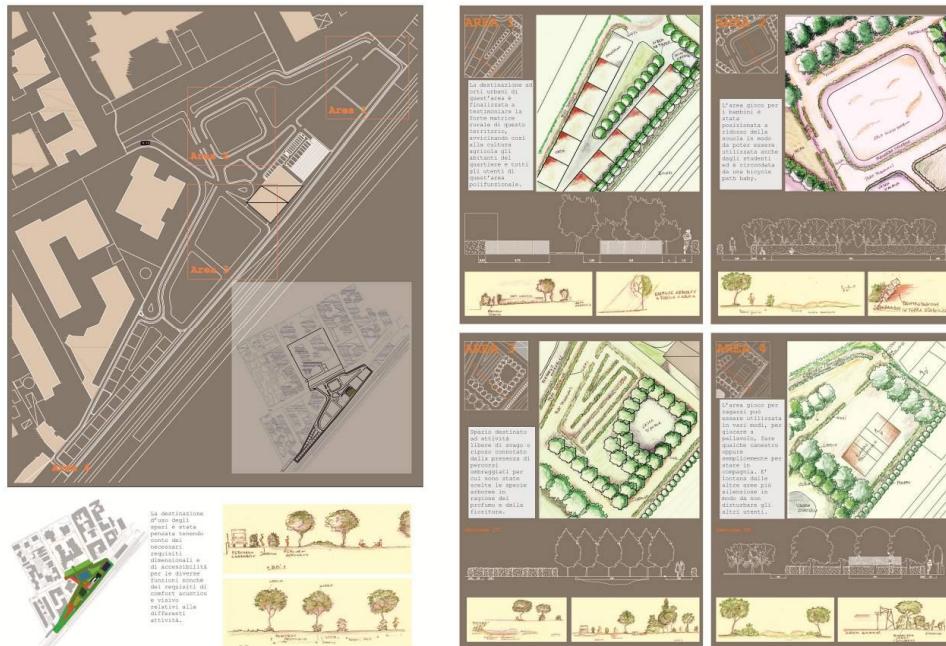


Figure 3 - Study of spaces for activities in the redevelopment of the ex-freight area.

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