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## Urban regeneration: between resilience and sustainability

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### Abstract

The paper describes the main theoretical and practical lines that affect the scientific activities carried out at the University of Florence by some members of the scientific section of Architectural Technology on the issues of sustainability and Technological Innovation in the Design of Urban Environment. The methodological aspects and the findings of two researchers are described as a result of the national and international experiences developed by the researchers in the last years.

These works represent some of the research programs in the field of Architectural Technology, with a perspective that emphasizes the topic of sustainable development both from an environmental and social point of view, in order to assure a good economic growth of the countries.

### Parole chiave:

- PE8-11 Product design, ergonomics, man-machine interfaces
- PE8-12 Sustainable design (for recycling, for environment, eco-design)
- SH3-1 Environment, resources and sustainability

### Resilient requalification of urban space

One of the issues faced by the Florentine unit is housing emergency related to migration flows and the urbanization of poverty.

Since some years, more than half (54%) of the world population lives in high-density urban settlements, with a trend reaching the 66% in 2050 (UNDESA, 2015). This phenomenon has determined a continuous growth of the urban areas, above all in the developed countries, where the construction of at least 70 million new homes are expected in the next year (UN-Habitat, 2003).

This urbanization phenomenon regards mostly the population that shows economic, social, and cultural disadvantages. These people adapt themselves to live in poor settlements

made up by precarious dwellings without any supporting infrastructure. The parts of the city where they live are known by many names: slums, favelas, villas miseria, shantytowns, bidonvilles (Sampò, 2012). These informal settlements (that are usually illegal and out of public institutions control) generate unbearable living conditions from an environmental, as well as social and cultural point of view. The spontaneous growth of the informal settlements generates risk of various conditions: from the hydrogeological risk caused by the structural instability of soils to the structural one caused by poor construction, from the sanitary risk caused by the precarious health conditions to the social one caused by the engraftment of crime.

The phenomenon of urbanization and housing emergency is further exacerbated by the migration flows which, in recent years, have been particularly affecting the European and Mediterranean countries (UNDESA, 2016). Conflicts, economic instability, loss of human and civil rights, natural and man-made disasters, and climate change, pushed a large number of people to migrate to other territories which have to bear a pressing and unstable housing demand from people affected by a serious social and economic crisis. Looking at this reality, careful attention is given to the planning of settlements and the building design, both in the case of renovation and new construction.

This means conceiving a habitat able to meet the minimum requirements in compliance with environmental and architectural quality; or working on the concept of “architecture of necessity” characterized by aspects (affordability, essentiality, simplicity of construction, reversibility, recyclability etc.) common to many fields of living.

Raise the quality level means overcome that state of insecurity, usually associated with the concept of provisional, and recover a level of livability closest to the ordinary one, although in a transitional condition; this means addressing the issue of inhabited

space resilient with respect to the urgent transformation dynamics reflecting on new forms of social life, on formal and informal construction of habitats, on the metamorphosis of the city and of the territory, on the different levels of appropriation of the public and private space, on the integration processes in the context of a multicultural society, being aware of the need to deal with the issues related to environmental, social and economic sustainability and technical and operational feasibility of the projects.



Fig. 1a/1b. The Serrinha Favela in Florianopolis (Brasil).

### Methodological aspects and research findings

Given the globalization of phenomena and the international dimension of the problems, the research arises mainly in a context of collaboration with foreign institutions. In the specific case of the upgrading of the informal settlements, the research has been developed in the framework of the international agreement of scientific and cultural cooperation between the University of Florence and the Universidade Federal de Santa Catarina (Brasil) through both a theoretical and practical seminar based on the analysis of a specific study case (the Serrinha Favela in Florianopolis in the State of Santa Catarina) (fig. 1a/1b) and the setting of design indicators for the sustainable upgrading<sup>1</sup>. The absence of any kind of territorial and urban planning model associated to the development of these informal communities often makes it difficult to orientate the planning of reliable scenarios. This procedural lack determined the need to approach design with an operating methodology aimed firstly to identify risk causes, and then to find solutions to improve the living quality of informal settlements, in their relationship to the territory.

The design proposals have been based on the following needs:

- to decrease informal land consumption, adopting models for public occupation of “non-built areas” strictly associated to the local culture which can host social and economic activities for the community;
- to increase green areas, intended as a linear and physical space, that redraws the boundaries of the informal settlements, and as a “non-built area” to be used in agricultural production;
- to reduce landslide risk, adopting urban solutions that promote rainwater saving;
- to increase technological solutions to promote self-construction processes, with the use of recycled and/or recyclable materials and energy passive solutions at urban and building scale, with the aim to improve the indoor and outdoor comfort;
- to perform passive solutions at urban and building scale for the optimization of natural ventilation instead of traditional mechanical ventilation systems.

All proposals have been based on the concept of infrastructure as basic element in settlement upgrading. It could provide network services necessary for the inhabitants of the favela (roads, power etc.), assuming not only the technical and constructive solutions, but also a model coherent with the economic capacity and user management according a thematic approach that has mainly showed positive results in case of slum upgrading (Abbott, 2002). These considerations arise from the observation that, in the case of Serrinha Favela as for many Brazilian ones, the local municipality attend regularly later, investing significant financial resources to solve problems arising from the lack of services and general infrastructures at first of spontaneous settlement. From this point of view it is assumed that the municipality becomes the main actor in the upgrading process providing an infrastructural system (Friedman, 2009). In the specific case of the Serrinha Favela the activity of design research (fig. 2a, 2b, 2c) has been finalized to the introduction in a masterplan of a regeneration evolutive model, importing the concept of social infrastructure in to a physical network of spaces for the community in order to develop its own identity and at the same time the integration with the formal city according to primary planning and design strategies: regulate urban expansion on the territory re-defining the boundaries, determining a settlement model compatible with the cultural traditions and physical characteristics of the context based on the concepts of environmental sustainability and social cohesion, provide



Fig. 2a. Design proposal for the Serrinha Favela (Florianópolis – Brasil).

## SERRINHA RESILIENTE

resiliente oggi, dal resiliente «antis-ribalzaro».  
Il termine resiliente indica la capacità di un individuo, di una comunità, di una città di reagire, adattarsi o sopravvivere prescindendo da esperienze traumatiche. L'obiettivo da perseguire è la riorganizzazione della Serrinha finalizzata alla ricerca di un nuovo equilibrio sempre dinamico e mai statico. Tale equilibrio vuole essere raggiunto attraverso il progetto di una rete di **infrastruttura polivalente**: fisica, economica, sociale e culturale.

### STRATEGIE PROGETTUALI

Le strategie rappresentano le linee guida per ciascuna decisione progettuale: ogni intervento nasce come risposta a una o più tematiche emerse dall'analisi della Serrinha, con lo scopo di risolvere le problematiche e valorizzarne le potenzialità, seguendo sempre il principio di RESILENZA.

#### 1. RIDEFINIRE I MARGINI

I limiti fisici della favela sono in continuo cambiamento e condizionati da una rapida espansione informale. La comunità ferma la sua espansione rispettando un limite fisico quando tale confine offre un servizio pubblico a vantaggio della stessa. Una rete di infrastrutture e spazi pubblici attrezzati può rappresentare un limite rispettato dalla comunità occupazione abituale dei spazi e può inoltre rafforzare l'identità comunitaria.

#### 2. PERMEABILITÀ TRA CITTA' FORMALE E INFORMALE

Progettare interventi per rafforzare il debole rapporto di scambi e connessioni fisiche e sociali tra la Serrinha e il tessuto urbano circostante. La strategia di progetto prevede di lavorare sulle aree di interconnessione tra i due poli formale-informale: stesse non tanto come limiti territoriali, quanto come opportunità per l'interscambio culturale e disciplinare.

#### 3. POTENZIAMENTO DELL'ECONOMIA LOCALE

L'introduzione di nuove attività commerciali incide sullo sviluppo dell'economia locale, infuocando direttamente nello sviluppo urbano della comunità. La creazione di attività e beni comunitari favorisce inoltre uno scambio con l'economia esterna alla favela, generando nuove fonti di reddito e di impiego.

#### 4. APPROCCIO SOSTENIBILE

In architettura e nella pianificazione urbana la sostenibilità riguarda il modo di costruire, di abitare, di gestire e usare la città e il paesaggio. È la consapevolezza dell'impatto ambientale di ogni azione umana. La qualità dello spazio urbano che rispetti la natura deve essere l'obiettivo della progettazione urbana e condizione essenziale per la sostenibilità. Una progettazione sostenibile mira alla qualità della vita dei cittadini, considerando l'importanza della comunità come luogo dell'abitare, "luogo di relazione con il mondo".

#### 5. INNOVAZIONE E PARTECIPAZIONE AL PROCESSO COGNITIVO

La strategia progettuale si basa su modelli ripetibili e scoperte essenziali che coinvolgono l'intera comunità tramite processi partecipativi di autostrutturazione. La qualità della progettazione e della gestione dello spazio dell'abitare dipendono anche dalla volontà di rendere i cittadini partecipi delle scelte progettuali. L'obiettivo finale vuole essere quello di fornire conoscenze adeguate e strumenti utili all'individuo nella costruzione della comunità in maniera autonoma e consapevole.

### INTERVENTI PROGETTUALI



#### 01 CICLO DEI RIFIUTI

Il progetto propone di introdurre, in un territorio ad alto rischio ambientale, delle azioni dimostrate efficaci alla prevenzione, trattamento e valorizzazione dei rifiuti in loco (fraccida differenziata). Lo scopo è creare una rete concreta ed efficiente che rappresenti l'inizio di un percorso di gestione sostenibile dei rifiuti. L'iniziativa di un ciclo di raccolta adeguato è un efficiente strumento di informazione e formazione necessaria per la comunità a può essere sostenuto dalla vicinanza del centro di riciclaggio presente nel Maro da Cruz.



#### 02 SLOW MOBILITY

Vivere la città è un elemento fondamentale per chi vi abita. La realizzazione e riqualificazione di percorsi pedonali e ciclabili sono dunque necessarie. Il progetto prevede di completare la parte sud della favela al centro dell'insediamento attraverso un sistema di rampe pubbliche, realizzando quindi un nuovo impianto di circolazione pedonale in un'area caratterizzata da forte pendenza. Un'ulteriore connessione viene realizzata nel percorso in prossimità degli orti urbani attraverso la realizzazione di un'area pedonale. Tali interventi sono affiancati da una riqualificazione delle esistenti e dalla creazione di percorsi ciclopedonali, anche nel verde, che offrono alla comunità la possibilità di muoversi in maniera più sostenibile.



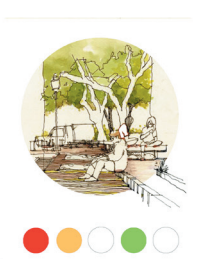
#### 03 ORTI URBANI

La Serrinha presenta aree ad alto rischio idrogeologico. L'utilizzo dell'agricoltura urbana in tali zone aiuta a trasformare il suolo in un bene produttivo e di sistemamento, utile allo sviluppo dell'economia locale, alla socializzazione e all'educazione ambientale. L'area individuata per la creazione degli orti è caratterizzata da resistenze in gravi condizioni di precarietà a causa della morfologia del terreno, e perciò saranno rimossi. Tale progettazione vuole impedire la probabile ricopertura abusiva dei suoli a rischio frane, attraverso l'alternanza di orti e piante di bambù, la cui radice sono un eccellente protezione contro l'erosione e lo slittamento del terreno.



#### 04 ACCESSIBILITÀ

La carenza di connessioni dell'abitato informale con la viabilità principale della città viene risolta con la creazione di due nuovi tratti stradali, che rendono possibile il raggiungimento della Serrinha dai poli principali della città formale. Le nuove strade dell'insediamento a margine sud-ovest della comunità, facilitando l'accesso campestre, pedonale e ciclabile a una zona dell'abitato attualmente difficile da attraversare. Tali interventi, sud-est, collegando l'insediamento con l'Università Federale di Santa Catarina. Entrambi i tratti permettono inoltre l'arrivo a nuovi edifici pubblici progettati.



#### 05 RETE DI SPAZI PUBBLICI

Il progetto propone l'utilizzo di zone degradate o inutilizzate in aree di verde attrezzato o in luoghi creativi e dinamici. Il nuovo sistema di spazi pubblici rappresenta perciò una rete fisica di collegamento tra le infrastrutture progettate e un insieme di zone di svago e di riposo nel denso tessuto dell'abitato informale. Gli spazi offrono inoltre come "situazioni accoglienti e stimolanti", luoghi di socializzazione per la comunità, aperti e flessibili, adatti a integrare architetture e programmi temporanei per l'aggiornamento.



#### 06 RICOLOCAMENTO CASE

Le zone della Serrinha ad alto rischio idrogeologico sono caratterizzate dalla presenza di molte abitazioni in condizioni precarie. Tali residenze vengono perciò rimosse dalla prefettura per motivi di sicurezza. L'idea progettuale è quindi la ricostruzione di abitazioni a chi non ha i mezzi per acquistarle, in zone adeguate. La strategia prevede sia operazioni di ricostruzione sia operazioni di progettazione puntuale con moduli abitativi da inserire nel contesto urbano, proponendo inoltre la partecipazione attiva della popolazione attraverso processi di autostrutturazione.



#### 07 SCUOLA PER L'INFANZIA

L'istruzione è un diritto fondamentale per ogni bambino e per ogni comunità. L'architettura scolastica può stimolare aggregazione, fantasia e creatività, essendo strumento di promozione e progresso sociale collettivo. L'educazione infantile è un tema che interessa da vicino gli abitanti della Serrinha, i quali desiderano fortemente la realizzazione di un edificio scolastico, in grado di accogliere parte dell'elevato numero di bambini della comunità. Il progetto prevede quindi un'infrastruttura con asilo e scuola materna (da 0 a 6 anni, come previsto dall'istituzione brasiliana) che rappresenti uno spazio sicuro, di sviluppo, svago e socializzazione.



#### 08 SANITÀ

L'idea di inserire un presidio sanitario nella comunità della Serrinha è direttamente collegata al diritto alla salute inteso come "diritto sociale" e vuole sottolineare l'importanza dell'equità della salute per tutti i cittadini, senza discriminare la sua condizione economica e sociale. Ad oggi le persone che abitano nella Serrinha non dispongono di un ambulatorio di "quartiere", né di un medico di base che provvenga alle cure più elementari. La creazione di una unità sanitaria di base, vicina a dove le persone vivono, lavorano e studiano, svolge un ruolo centrale nel garantire l'accesso della popolazione a servizi sanitari di qualità.



#### 09 CENTRO CIVICO

Il centro civico culturale si propone di creare un luogo dove la comunità possa interrelazionarsi tra di loro, generando ambienti per la collettività, interni ed esterni. Il carattere principale è la piazza popolare retrostante, sono gli spazi pubblici entro i quali si svolge. L'obiettivo è di renderlo un punto di riferimento per la cultura del luogo e un catalizzatore urbano dell'area.



#### 10 MERCATO ALIMENTARE

Il progetto di natura economica e sociale prevede la collocazione di un gruppo di consumatori, di agricoltori e di artigiani che vuole contribuire alla crescita di una economia diversa da quella che domina gli scambi e la qualità delle relazioni umane. Il mercato che si va a creare è un mercato Popolare, ciò significa che non deve diventare un luogo di ricerca ed esclusione, ma che invece, attraverso una pratica di prezzi il più possibile contenuti e condivisi, si apre sempre più ai settori sociali svantaggiati. L'obiettivo è che diventi un contesto frequentato, partecipato, accessibile e comunicativo.



#### 11 CENTRO FORMATIVO PROFESSIONALE

Il centro di formazione professionale è occupato di fornire i requisiti base per un tipo di costruzione sostenibile, con materiali edili innovativi e costruttive che ne permettano il riutilizzo, la modularità e il riciclo. La posizione di questo edificio è strategica, in quanto contiguo all'area che da sempre è stata oggetto di conflitti di proprietà, ovvero quella del parco tra l'università UFSC e l'abitato della Serrinha. Tale centro diversifica così il modello ideale tra le due parti, dando a ciascuna un ruolo specifico e interessi comuni e attenuando così i conflitti presenti nell'area.



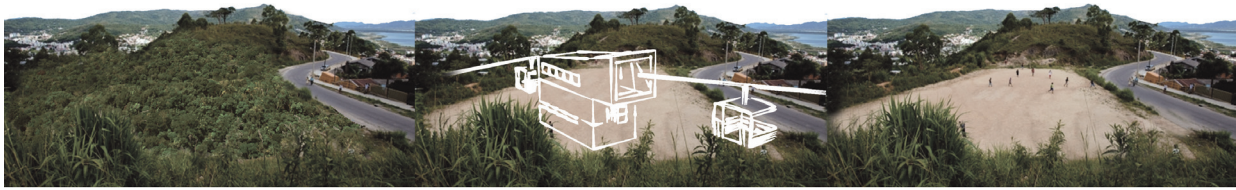
#### 12 CENTRO RICREATIVO

Si tratta di un approccio innovativo alla rigenerazione di spazi inutilizzati nei centri delle città. L'idea di un centro ricreativo è un'attività che non permettono l'uso permanente del suolo. Questo tipo di intervento è utile alla realizzazione di un edificio temporaneo che possa essere smontato e rimontato in altre parti del quartiere. L'idea di base è di far parte della comunità un servizio attraverso i principi di autostrutturazione e sostenibilità.



Fig. 2b. Design proposal for the Serrinha Favela (Florianópolis – Brasil).

**PROCESSO DI APPROPRIAZIONE DELLO SPAZIO PUBBLICO**



AREA NORD EST

PREVISIONE DI UNA FUNICOLARE PER PERMETTERE COLLEGAMENTI CON MORRO DA CRUZ (MAI REALIZZATA)

APPROPRIAZIONE DEL TERRENO PIANEGGIANTE PER USO PUBBLICO

**ESEMPI USO IMPROPRIO DELLO SPAZIO PUBBLICO**



TERRENO DI PROPRIETA' CASAN DIVENTATA DISCARICA ABUSIVA

TERRENO DI PROPRIETA' CASAN DIVENTATA DISCARICA ABUSIVA

TERRENO DESTINATO ALLA FUNICOLARE DIVENTATO CAMPO DA CALCIO

**STRATEGIE DI ATTUAZIONE**



**Fase 1: ACCESSIBILITA' e STRATEGIA DI INSEDIAMENTO**

- \_Ampliamento e connessione della rete viaria principale e secondaria
- \_Liberazione e preparazione dei lotti tramite operazioni di movimento di terra
- \_Creazione di ciclovie e di percorsi pedonali trasversali
- \_Interventi di edilizia residenziale estesi o puntuali all'interno della comunità
- in sostituzione degli alloggi collocati in aree di rischio idrodeologico o lungo le infrastrutture viarie

**Fase 2: APPROPRIAZIONE PARTECIPATIVA DEGLI SPAZI COMUNITARI**

- \_Utilizzo dei lotti da parte della comunità per attività pubbliche temporanee
- \_Progettazione di vuoti urbani o "spazi interstiziali" come luoghi pubblici di aggregazione sociale

**Fase 3: RETE DI INFRASTRUTTURE POLIVALENTI**

- \_Progettazione di una rete di servizi pubblici multifunzionali



UNIVERSITA' DEGLI STUDI DI TRIESTE - DIPARTIMENTO DI ARCHITETTURA E URBANISMO - COORDINATORE: PROF. PAOLO GALLO  
 In collaborazione con Universidade Federal de Santa Catarina - UFSC  
 Corso di Laurea Magistrale in Architettura, A.A. 2015 - 2016  
 Seminario tematico: **ABITABILITA' IN AREE DI RISCHIO**  
 Riquadrificazione sostenibile in aree urbane, Florianopolis, Brasile  
 Prof. Roberto Bologna, Prof. ass. Paolo Gallo  
 Prof. Ferruccio Batti (UFSC)  
 Prof. ssa Camilla Perone, Prof. ssa Rosa Romano  
 Giulia Bocchi, Giada Chizzacci, Lucia Dalena, Maria Rosaria Di Genaro  
 Giulio Hasanaj, Silvia Magnolfi, Chiara Morelli, Elena Mucci  
**METAPROGETTO 7**

Fig. 2c. Design proposal for the Serrinha Favela (Florianopolis – Brasil).

housing with the primary services (roads, water supply, electricity, sewerage etc.), establish social services for the community (social and cultural centers, childcare centers, commercial facilities etc.), establish the minimum conditions of security against the prevalent structural, hydrogeological, sanitary, electrical risks, stimulate initiatives, participation and community self-determination processes in a framework of general rules, promote a self-sustaining local and legal economy.

### **Urban Entropy and Sustainability**

In the field of technological design for architecture, the main interlocutors of those researches developed by the University and the recognised Research Centre in the O8 area (engineering and architecture) are building enterprises, industries involved in technological components construction, and public administrations (regions, municipalities, cities). They respectively represent the community producing scientific and technological knowledge (the offer) and the community takes advantage of the scientific and technological knowledge as social and cultural capital (the request) (Gallo, 2017).

In this Scenario, starting from the European Framework Programmes included the last Horizon 2020, the role of the offer became more important, of industries and enterprises then, as participation between private and public became favourable, in order to convert theoretical research in applied research.

Thanks to the determining impulse of the European Union, emerged the necessity of considering the development goals of the enterprises within a new competitiveness concept which we refer to as “economy capability to guarantee to its population, on sustainable basis, high and growing levels of quality of life and high occupation” (Lisbona 2000).

What aforesaid put the basis for a change in productive politics: a sustainable development requires social and environmental safeguard, which, together, has to enhance economical growth.

The European Union added the environmental element to the economical and social ones while talking about development (Göteborg European Council 2011), as a booster for technological innovation and potential and economical investments, that might further generate occupation and wealth.

In the last difficult years, in order to face the challenge of nationalising markets, industries have innovated their management and productive processes, and districts have stented their limits and spread their networks.

Furthermore, companies often marked how their competitiveness, in regards to technological and international competition, was related to the territory's elements: that's why an integrated governance of actions and persons is needed. Following this concept and applying it to those problematic areas of our territory (from an environmental point of view) an important step was taken in the recent years: enlargement of the concept or marginal areas regeneration. In particular abandoned productive areas through the application of communitarian programmes<sup>2</sup> and national instruments<sup>3</sup>, became a target in territorial regenerations, as fundamental areas for the Public Administration's governance strategies (fig. 3).

In particular, the Regions' sensibility in considering the environmental subject in their planning strategies and their will to programme and standardize initiatives in this field, encouraged governance actions concerning abandoned productive areas reuse and regeneration (Regione Marche 2005).

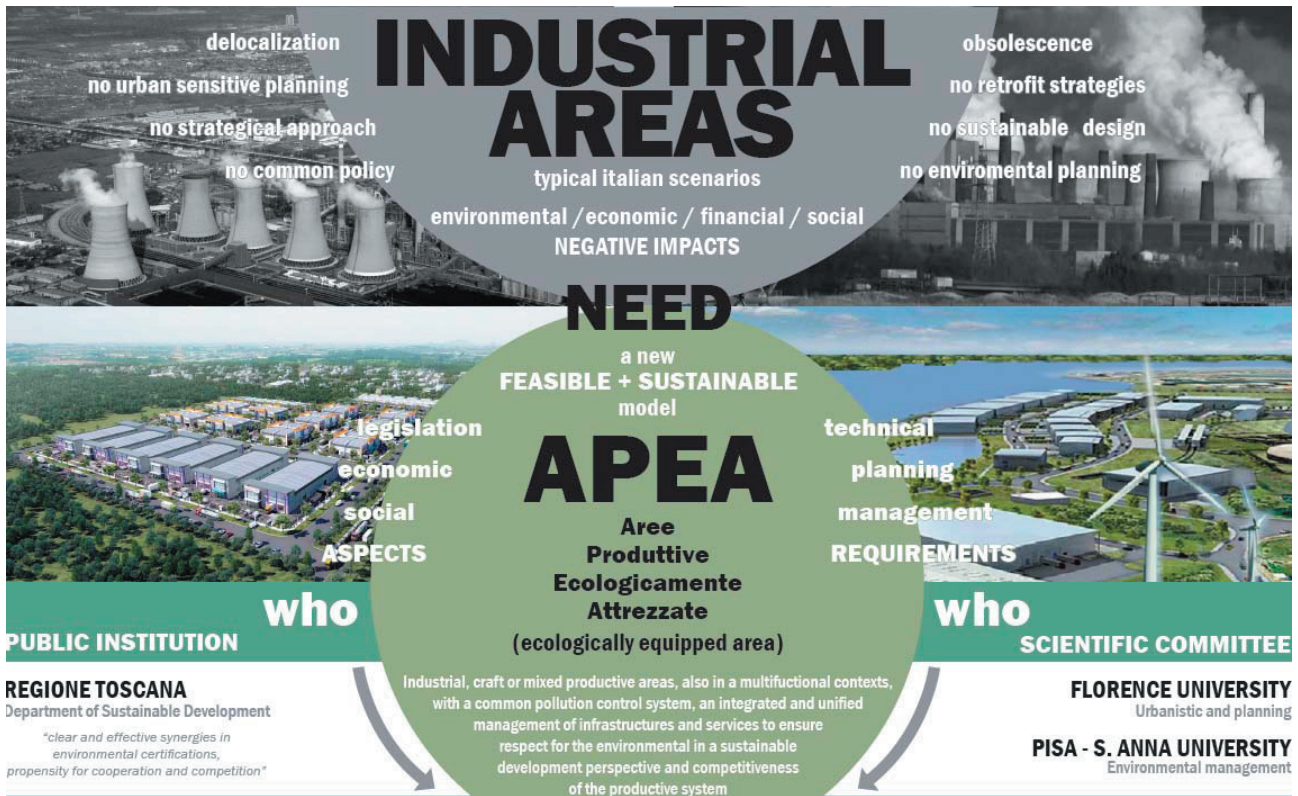


Fig. 3. Industrial areas impacts and criticisms

Despite these initiatives, a main problem is the lack of interest toward those areas, totally or partially abandoned, located in smaller towns or in the cities' peripheries. Indeed these areas poorly attract estate investors, that tend to prefer abandoned industrial areas located in more dense urban areas, and that have often been subject of transformations and speculative operations (Cetica 1998).

The phenomenon of industrial areas in state of abandon and/or in regeneration, poses important questions that might be tackled through architectural critical instruments. These need to consider the complex relation between the concept of vacant area as a resource and the concept of territorial development and preservation, and furthermore the difficulty in facing and managing both a material and an immaterial heritage.

The intervention on industrial areas (new and existing ones) are therefore an occasion for a new scenario of ecological productive areas generation. The industrial area management, according to general and specific regulations <sup>4</sup>, has to represent a benefit for the enterprises (in terms of sustainability in production processes) and has to enhance the quality of life in the area itself and in the territory where it is located (Gallo, Carletti 2000).

Sustainability in urban transformations: a rediscovered concept

Several administrations, interpreting the innovational needs of the production systems and processes, caught the occasion to create an environment that could enhance enterprises' development and generate new capabilities, focused not only on product quality, but also on the quality of the territory generating the products themselves.

In this framework a group of researchers of the Università di Firenze<sup>5</sup> in partnership with the



Regione Toscana<sup>6</sup> developed a research that defined programmatic guidelines for a new concept of an industrial productive area that might consider its effect on the environmental contexts in which it is located, and viceversa the context's effect on the area itself (Regione Toscana 2006).

The research focused on subjects that were already pursued at a European and national level and especially on:

- Industrial districts renovation
- Enterprises clusters enhancement aiming to improve the industries competitiveness
- Interaction between endogenous and exogenous development logic

According to that, following the programmatic national guidelines toward industrial areas and the costumers' requests, the research focused on the definition of specific guidelines and programmatic directions that might guide the abandoned industrial area transformation interventions. The transformation process will indeed be able to change the area's character from residual spaces to resources for the city.

The subject was introduced by the D.Lgs. n. 112/98, also known as "Decreto Bassanini" that pointed the so-called APEA Ecologically Equipped Productive Areas. The law demands single Regions the will to legislate, while posing some general basis:

1. Ecologically equipped productive areas are characterized by those infrastructures and systems necessary to guarantee environmental safeguard, health and security.
2. Ecologically equipped productive areas are characterized by a unitary management system of infrastructures and services
3. The productive equipment's in ecologically equipped productive areas are exempt from authorizations acquisition for the usage of the area's services.

In this scenario the national and regional laws issued so far aimed to verify the actual opportunity of realising, or regenerating, ecologically equipped productive areas on regional territories, in order to define a new sustainable anthropic paysage reaching the goals of environmental quality and infrastructural integration.

According to that the research's objective was defining and innovative methodology for the design and the regeneration of industrial (productive) areas, changing the production process from being an environmental problem to a development opportunity.

#### Applied research work objectives

The APEA model state of the arte recognition shows multiple scenarios. Indeed only a few<sup>7</sup> Regions took a step towards the mere law acceptance, even if, in those cases, where a specific legislation hasn't been pursued, regulations enhancing a sustainable management of productive areas and the creation of Industrial Eco-Parks have been registered (Bollini, Borsari, Stacchini 2007).

The Regione Toscana, starting from the Piano Regionale di Azione Ambientale 2007-2010, pursued this opportunity, activating specific initiative that involved the stakeholders involved in productive areas management. The aim was defining, starting from the analysis of experiences, best practice and the comparison with case studies of different regions, a range of references and indications that might make the APEA instrument viable for the Tuscan territory. In the last few years, the importance of safeguarding such an innovative and complex regulation became clear and viable through the activation of debate opportunities,

both at national level with the central public administration and other regions, and at local level with the main stakeholders.

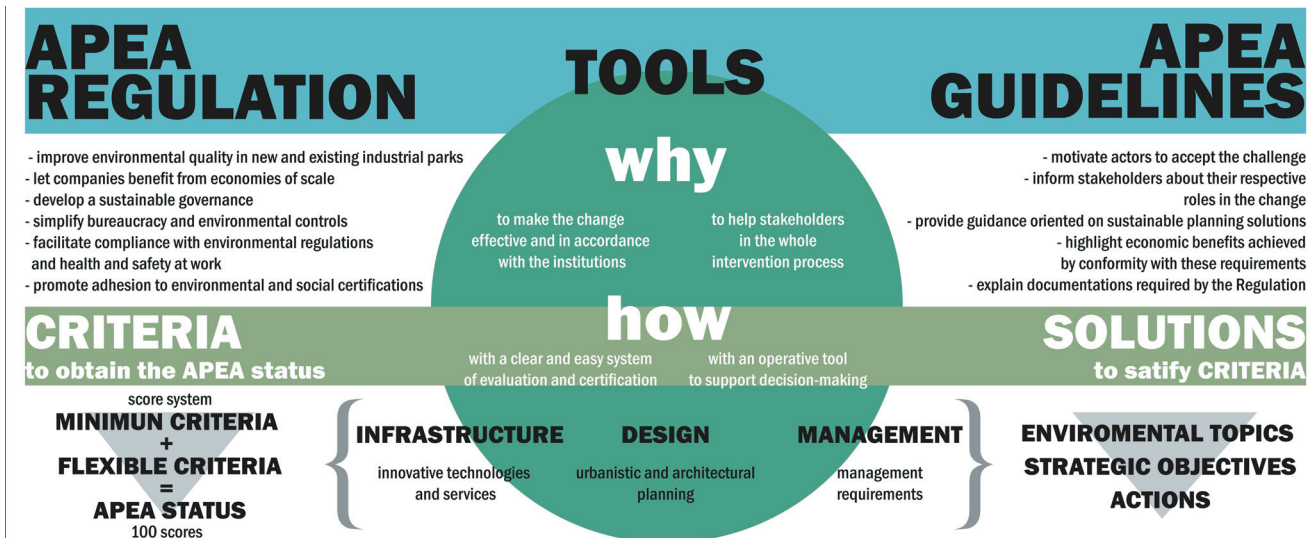


Fig. 4. The regulating scheme for the APEA in Tuscany.

For this reason, and in order to reach the law’s objective, a working table involving Regione Toscana, Dipartimento di Architettura<sup>8</sup> and the Scuola Superiore di S. Anna di Pisa, was created. Its aim was thus creating a non prescriptive regulation and a specific guideline for the sustainable design of productive areas: it consists of a document that develops and describes all the project aspects pointing the best methods for an ecologically equipped productive area project (fig. 4).

According to the APEA requirements shared by the Regions that participated in the guidelines elaboration, the research group work was conducted as follows:

- First of all the excellent performances while researching in APEA, might start from special design, technological and mobility network, urbanisation rules definition;
- Secondly, the research focused on technical aspects also at a building level: the application of best (from an environmental point of view) technologies (dual networks for the water cycle, energy production), common spaces and equipment (common waste areas, common rain water harvesting and treatment areas);
- Finally the work focused on the optimization of the management systems and links between the various enterprises involved. For example a common management systems of spaces, waste storage and reuse, mobility, energy etc.

The guidelines structure was defined by the research group was conceived in order to show the main strategies, opportunities and benefits that an APEA project can offer to an existing economic and productive context.

#### Strategic objectives and research results dissemination strategies

The methodology pursued for the APEA Guidelines started with the individuation of the *Environmental Themes*, to which corresponds *Strategic Objectives* defining specific *Actions* fulfilling the APEA requirements.

In particular the particular themes show the essential principle for planning and sustainable development, in order to define which equipment and characteristics a productive area will have to have to be defined “ecologic”.

After a first comparison between: project goals, expected interventions, regional government orientation, and production exigencies, the main actions, viable to reach the mentioned goals, were systematized, and it was furthermore possible to define the most viable and efficient strategies for the renovation of industrial and productive factories.

It has been furthermore necessary to point the sectors where mentioned actions could be applied in order to define an Ecologically Equipped Productive Area, and this was pursued through the identification of three technical parameters<sup>9</sup> which represent the actions' application level:

- Unitary area management through the subject of the Soggetto Gestore, which is in charge of programming, infrastructure management, and common economical aspects management;
- Urban planning elements, which represent a key element for the settlement location choice, for the area accessibility design, and for the connection with the next territory and the urban settlements evaluation;
- Set and to be set enterprises involvement, that are responsible of the area management, and which requirements determine their belonging to the APEA or not.

The research work concluded firstly with the publication of a Regulation for the APEA in Tuscany that aims to create a governance model sustainability-oriented and that enhances public-private collaboration, and later on with the Guide Lines publication, a project instrument for several stakeholders (public administrations, designers, entrepreneurs) for the realization of a productive area that fits the APEA requirements<sup>10</sup>.

## **Future developments**

The research topics open the discussion of many issues. A first area of consideration is the role of the designer and the participation of the actors to the design process. In a world where all is design and all are designing (Manzini, 2015) the role of the architect-urban designer is not anymore that one of the demiurge dispensing solutions, but rather that one of a cultural mediator facilitating the dialogue and stimulating the contribution and the participation of all the stakeholders; a figure able to recognize the requests of the community and government on one hand and the needs of real user on the other. Only in such a way it is possible to overcome in advance the resolution of the conflict areas, such as those typically recalled in the researches, in order to assure the best quality of the result.

A second area of consideration regards the design of territorial and urban space according to criteria of adaptability and flexibility in time, that makes it possible to limit the “mortgage” and the permanent obligation of the soil, but assures the continuous evolution of the city following the social and economic dynamics of transformation according to the concept of temporary urbanism (Bishop and Williams, 2012).

A third and last area of consideration is the concept of the green economy in which the construction sector is primarily involved. This means to introduce the principle of the circular economy (recycling, reusing, regenerating) and stimulate new economic models in the production processes as well as in the strategy of urban development, considering the

specific territorial conditions, enhancing, at the same time, the natural, cultural and social capital.

## Notes

1. The research has been pursued since 2013, led by Prof. Roberto Bologna in partnership with professors and researchers from Florence and Florianopolis.
2. The LEADER (current 2014/2020) and URBAN Programmes, are two of those initiative, funded by the European Community, supporting projects in the field of territorial development
3. Examine PRU (Urban Renovation Programs: instruments aiming the transformation of consolidated urban patterns pursuing a more balanced distribution of services and infrastructures, environmental and architectural quality, in order to avoid spatial and social decay) or *Patti Territoriali* and *Programmazione Negoziata*
4. The D.Lgs. n. 112/98 known as “Decreto Bassanini” in the art. 26 “*Bolzano and Trento autonomous Regions and municipalities administrates, with their own regulations, design industrial and ecologically equipped areas, provided with infrastructures and services enhancing health, environmental quality..OMISSIS*”, introduces the concept of APEA
5. The Scientific and Technical Committee for the Regulation and Guidelines includes the Regional Sustainable Development group of Tuscany Region, School Superior of S. Anna of Pisa and University of Florence. The research group leded by Prof. Marco Sala, Prof. Paola Gallo with the participation of Arch. Valentina Gianfrate.
6. DR. Toscana n° 6269 of 6th December 2007 effecting PRAA 2007-2010. Effecting the E5 – Specific Objective “A.P.E.A. Promotion”
7. The research convention was signed by TAeD Department (Dipartimento di Tecnologie dell’Architettura e Design), actually Architectural Department DIDA of the University of Florence.
8. Only a few Italian Regions have nowadays regulated the APEA (Abruzzo, Calabria, Emilia Romagna, Liguria, Marche, Puglia e Toscana); and only four (Toscana, Emilia Romagna e Marche) actually developed tangible initiatives (such as projects, guide lines, funding) while the others are still programming their strategies
9. According to art. 18 of regulation L.R. 61/2003 of Tuscany Region
10. Tuscany Region, 2009a R.R. n. 74/r on APEA, effecting art.18 of the L.R. 10th December 1998, n. 87 Firenze. Tuscany Region, 2009b Resolution of Giunta Regionale n. 1245 approving the document “*Criteria for APEA performances definition guide lines*” (<http://www.regione.toscana.it/-/l-applicazione-della-disciplina-toscana-sulle-aree-produttive-ecologicamente-attezzate-metodologia-e-casi-studio>).

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