

# BEYOND ALL LIMITS CONGRESS 2018

International Congress on Sustainability in  
Architecture, Planning, and Design

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Proceedings Book of The Extended Abstracts



ÇANKAYA UNIVERSITY



Università  
degli Studi  
della Campania  
*Luigi Vanvitelli*



UNIVERSITY OF  
PLYMOUTH

October  
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in Architecture, Planning, and Design

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MAIN CAMPUS

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## FOREWORD

It is our great pleasure to welcome you to BEYOND ALL LIMITS 2018 - International Congress on Sustainability in Architecture, Planning, and Design, a joint collaboration of Çankaya University (Ankara-Turkey), Università degli Studi della Campania “Luigi Vanvitelli” (Caserta-Italy) and University of Plymouth (Plymouth-United Kingdom). The congress takes place in the Congress Hall of Çankaya University, Ankara, Turkey, on October 17-18-19, 2018 and supported by SID “Società Italiana Design”, SITdA “Società Italiana della Tecnologia dell'Architettura”, LeNS “The Learning Network on Sustainability” and GRID “Architecture, Planning and Design Journal”.

The congress aims to discuss and redefine the term sustainability with its all dimensions such as environmental, economic and sociocultural in various disciplines including architecture, planning and design, to extend the term’s boundaries through fulfilling it with scientific, genuine, innovative and inspiring studies and to foster cooperation within and between different disciplines at international level. Besides, workshops and special sessions are organized.

The scientific program consists of keynote speeches, plenary and parallel sessions of presentations and workshops. The 3-day congress has more than 200 contributing academicians, experts, researchers and professionals attending from several countries of the world. More than 100 presentations are planned in 28 sessions in 2 days. The third day is devoted to workshops which are organized by 8 different groups of academicians and professionals from related various fields. In addition to the contributed presentations and workshops, two invited keynote speeches are given: by Prof. Dr. Susan ROAF, Heriot Watt University’s Emeritus Professor of Architectural Engineering and Prof. Dr. Birol KILKIŞ, Başkent University’s Professor of Energy Engineering.

This proceedings book of extended abstracts comprises written contributions of the presentations, keynote speeches and workshops contents. Before the congress, all participants were expected to submit extended abstracts of their presentations in a format formed by a short abstract with keywords, introduction, methods, findings and discussion, conclusion and references, not exceeding 1500 words. All submitted extended abstracts were blind peer reviewed and accepted ones now take part in this book.

**BEYOND ALL LIMITS 2018:** International Congress on Sustainability in Architecture,  
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As being Congress Organization Committee, we would like to express our gratitude to all contributing members of Çankaya University, Università degli Studi della Campania “Luigi Vanvitelli” and the University of Plymouth for their superior efforts and enormous support. Furthermore, we would like to thank all participants of the congress for their outstanding contributions for sharing their knowledge, expertise and vision.

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## **Large-scale ecosystems regeneration: enabling the transition to a circular economy in the Vesuvius coastal area**

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**Abstract:** The paper faces the issues related with the reversal of a dissipative metabolism traditionally characterizing settlements, decoupling growth from finite resource consumption, forecasting performances' upgrade, social engagement, institutions empowerment. Taking into account the Ellen MacArthur Foundation paradigm (2017), ecosystems regeneration is supposed to be able to drive the transition towards a circular economy, where the value of resources is maintained for as long as possible. Taking into account a systemic and performance approach, the design strategy is tested in the Vesuvius coastal area. The regeneration methodology here proposed, focuses on the relations between technological regimes and spaces, defining compatibility ranges for shortening the loops and promoting inclusive technological innovations.

**Keywords:** Regeneration; transition; closing the loop.

### **Introduction (Serena Viola)**

For long, the term regeneration has been used as an umbrella concept with a special focus on protection, preservation and transfer of natural and manufactured resources to future generations. In Europe, starting from the '90s, the need to recover abandoned urban spaces informs several approaches and strategies (Bianchini, Parkinson, 1993; Griffiths, 1995; Evans, Shaw, 2006). Academic research and urban policy makers focus on creating or rebranding, culturally led settlements that suffer problems of economic or social degradation and impoverishment (Bailey, Miles e Stark, 2004; Comunian, Chapain, Clifton, 2010).

Referred to large scale ecosystems, the circular economy model introduced by the Ellen MacArthur Foundation (2017) leads to the ability of maximizing -through reuse, maintenance and rehabilitation - the value of settlements, activating social, economic and environmental synergies (Fusco Girard, 2014). The application of the circular paradigm to regeneration lies in the idea that an ever-growing economic development and profitability can happen without an ever-growing pressure on the environment (Stahel, 2016). The aim of giving up the make-use-dispose linear consumption approaches - cradle to grave -, in the name of closed loops - cradle to cradle - marks the pathway to urban symbiosis where spaces and processes are assumed as renewable material and immaterial resources that should be reused, respecting the planetary bindings (Raworth, 2017).

**Research methodology at the territorial scale (Rossella Franchino)**

Intervening on the development of the urban territory in order to find an alternative to the model that has unfortunately emerged during the last century, any transformation and rebalancing interventions must necessarily address, with particular attention, environmental compatibility (Franchino et al., 2011). The territory as a whole, which consists of a set of important architectural and functional features that are surrounded and interrelated with the environmental air, water and soil matrices, should therefore be configured by technological interventions validated within a more general environmental compatibility debate. The overall aim of studying environmental compatibility also specialises in a number of specific objectives, which essentially consist of the ability to detect natural and anthropogenic environmental aspects as well as contain its transformations within the context of secure sustainability.

The territory should, therefore, be conceived as an organism with a dynamic equilibrium achieved through the technological control of complex functions. The compatible and sustainable territory should be configured as an urban ecosystem, with high ecological and environmental standards in which each process is controlled so that its impact, and consequently the induced irreversible degradation, is the minimum possible in relation to the process constraints. It is worth considering the territory as an actual ecosystem (Adler, Tanner 2013) (Aitkenhead-Peterson) penetrating the assessments of the interrelationships between natural and anthropogenic phenomena as well as those providing tools and methods for its rebalancing.

In order to address a recovery study with the aforementioned conditions, the analysis and design technologies that can be used in environmental restoration interventions differ from the traditional ones used for a single building or in building contexts, since being applied to the environment, they must consider a complexity of variously interrelated factors.

The environmental transformations are dynamic and depend essentially on how the moving systems are inserted and possibly alter the static systems.

Precisely due to this specificity, an appropriate analysis method could be the matrix, where the environmental characteristics are associated to the factors that have an influence on them with a gradual assessment reported in the intersection element. The system, based on the matrix representation, despite its schematic nature, can represent a methodology that allows to approach the complexity of the object under analysis.

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This methodology also allows to observe the environment in its uniqueness and unrepeatability since everywhere physical and biological transformation processes can be configured which do not appear anywhere else except for their basic characteristics.

#### **The methodological specificities at the building scale (Serena Viola)**

Researches and practical experiences in large-scale ecosystems, converge in identifying regeneration as complex knowledge-based processes, aimed at re-circulating waste - physical, social, cultural ... - determined by transitions (Grin et al., 2010). Assuming the Torre Annunziata settlements as case study, the paper focuses on the synergies that for centuries afford the material culture, drawing reciprocities between the constructive and productive processes. During the 20<sup>th</sup> century, several uncontrolled pressures compromise the agri – food manufacturing culture. Taking into account a systemic and performance approach, at the building scale, three phases support the definition of regenerative scenarios:

- Outlining the relationships between places and manufacturing, in terms of processes, products and waste;
- Mapping the transition processes occurring at the architectural and urban scales;
- Defining compatibility ranges for shortening the loops and promoting inclusive technological innovations based on waste re-use.

#### **Findings and Discussion at the territorial scale (Rossella Franchino)**

In order to obtain an applicative definition of the concepts previously presented is illustrated below a case study focuses on the environmental and functional requalification of the decommissioned railway lines between Gragnano and Castellammare di Stabia. The case study examined is particularly interesting since it refer to open urban spaces which, in some cases, have highly compromised ecological-environmental conditions, and their transformation corresponds to a renewal of the urban context.

The aim is to carry out an intervention that, though not restoring the railway, always includes the linking function through a thematic route that by joining the two urban centres of Gragnano and Castellammare di Stabia can express the continuity of the territory. While including the realisation of a vast linear park and an arena space, the most significant aspect of the intervention is the urban farm to which the context of street food is associated. This urban farm, which is the core of the requalification, is linked to the concept of “productivity” highly representative of the territory.

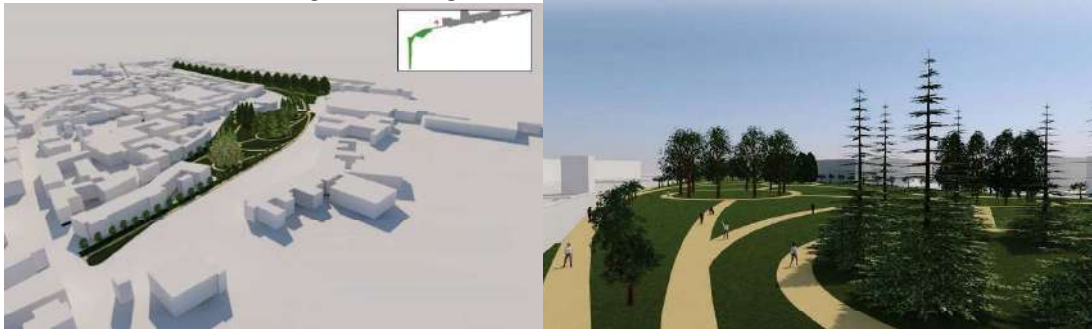


Figure 1. General view (elaborated by Tommaso Famoso).

### **Findings and Discussion at the building scale (Serena Viola)**

An imbalance between a demand for innovation and the available solutions, marks the scenario in which Torre Annunziata, as other settlements along Vesuvius coast, opens today to meet the circular economy issues. With a population density of 5,348.6 inhabitants per square km, the settlement shows worrying rates of social and building discomfort. The exceptional nature of the asset is not perceived by residents who progressively lose their relationship with the reasons that for centuries guided any technological transition. Cultural changes in the agri – food manufacturing and a renewed consumer awareness are the two nucleus for inclusive processes of regeneration based on reducing, reusing and recycling waste in order to promote synergies between identities and economies. Promoting a renewed idea of manufacturing, the regeneration bets on: the adaptability of layouts, joining, splitting up or rearranging environmental units and reconnecting spaces; the connectivity between functions, improving or decreasing the use surface, changing the facilities in the building and/or outside the building; the integrability of devices and systems with natural resources.

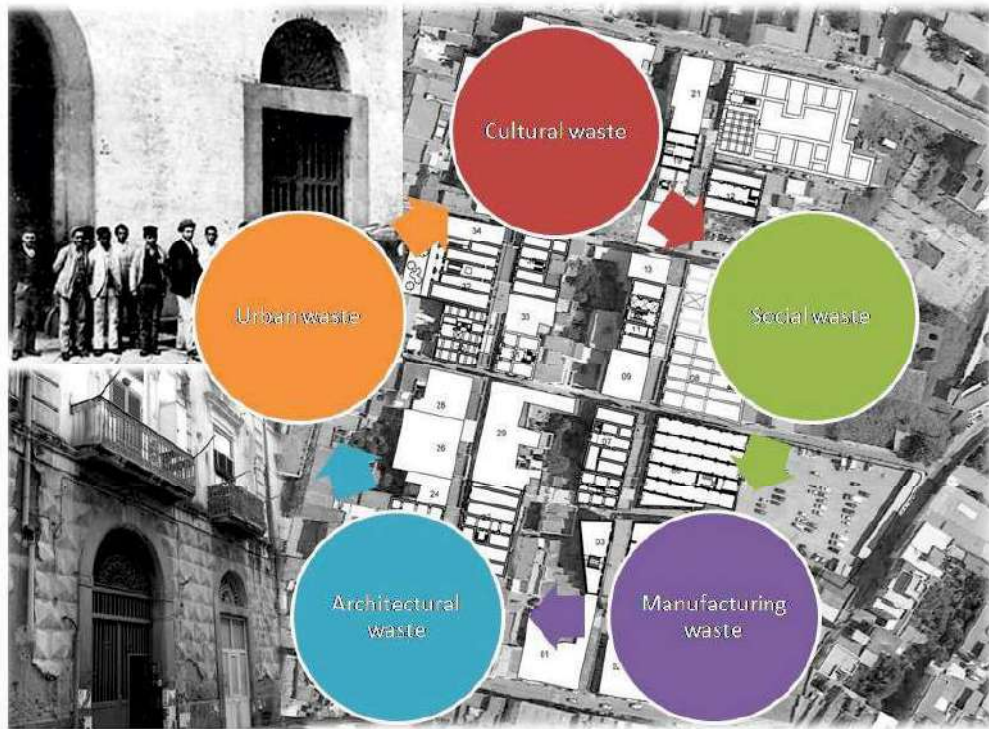


Figure 2. Regeneration approach for the manufacturing system in Torre Annunziata

## Conclusion

Recognizing a predominant role in the cumulative impact of minor improvements, a tailored technological approach supports the definition of design solutions. The theoretical hypothesis of reasoning about technological transitions is that only nature has the power to overcome waste creation, leading back in a harmonious unity, the fundamental disorder of reality. The preponderance of nature can contrast material and immaterial waste, returning productive vocation to places and holding communities together.

With such premises this paper has studied the application of natural resources in the sustainable management of urban transformation and has shown, through appropriately structured case studies, the significant environmental benefits arising from the use of principles of nature as a management model. Using nature's own ability to control the negative effects of urban transformation and focusing on promoting inclusive technological innovations is, among other things, not only environmentally, but also economically convenient.

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