Design Actions for

Shifting Conditions

Fabrizia Berlingieri Roberto Cavallo Emilia Corradi Hans de Boer **Editors**

TU Delft OPEN

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DIPARTIMENTO D'ECCELLENZA FRAGILITA' TERRITORIALI 2018–2022



TUDelft | Deltas, Infrastructures & Mobility Initiative

DESIGN ACTIONS FOR SHIFTING CONDITIONS

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Keywords

Urban Design, Transition, Climate Change, Architectural design

Published by

TU Delft OPEN Publishing | Delft University of Technology, The Netherlands

ISBN/EAN: 978-94-6366-517-9 DOI: https://doi.org/10.34641/mg.

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Layout design: Kevin Santus Cover design made by Fabrizia Berlingieri

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The publication has been realized thanks to the contribution of:

DAStU "Territorial Fragilities" Research Project funded by the Italian Ministry of Education, Universities and Research (MIUR), Departments of Excellence Initiative 2018-2022; DIMI Deltas, Infrastructure and Mobility Initiative, TU Delft.

Participating universities:



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Paths of Research





The first section investigates research questions concerning strategies, tools, critical reflections and effectiveness of the actions for the project of cities in transition. which the consortium of universities try to answer. The multidisciplinary character of the actions requires an important research effort in identifying the most appropriate tools, treating the lack of qualitative and quantitative data, estimating the times of cities modification. The proposed contributions attempt to identify the necessary steps to structure shared research paths, opening to specialized argumentations to respond to different problems, working in synergy with architects and planners. These vary from the role of digital technologies to anthropological aspects, or national and international legislation.

The goal is to build scenarios, capable of adapting to the times and sudden changes due to external factors that deeply and in a short time

affect the modification in the use of the city.

Therefore, the methodological indications relating to the analysis of contexts, data collection, their processing and integration, or difficulties in retrieval contribute to this objective.

The specific contribution of the experiences collected in this section illustrates research activities carried out within the University consortium. Hence, exploring specific cases and assuming precise theoretical positions, the relation between qualitative and quantitative approaches has been underlined in research processes. Specifically, they will be framed for the project tools and the operational dimension invested, both about the population and the disciplinary aspects of architecture.



ARCHITECTURAL DESIGN IN AN UNPRECEDENT TIME

Emilia Corradi

Introduction

How can the goals of transforming design methodologies for urban and infrastructural spaces necessary to fight against the many changes in contemporary society concerning emergencies and climate change be defined?

In the urban transformation of settlements less and less codified and defined, landscapes and settlements settings and large portions of land are transformed into residual spaces, lacking functions and spatial quality. Invisible factors determined the dynamics of change (Lerup 2016), such as tangible and intangible infrastructure, digital networks, cultural factors and climate change incidence. Combined with a continuous functional decommissioning situation of mainly productive sites, these spaces represent an essential part of the territory without any participation helpful element to climate change.

In this dimension, the project's role as an instrument of prevention and quality control of the environment and the inhabitants' wellbeing is non-existent. Moreover, this trend does not control the effects of the ecosystems' changes, nor does it predict or frame them in specific ranges, underlining them as a global problem. What can generally be assessed are only the often harmful effects of this lack of design, measurable in loss of life and material damage after a catastrophic event of any kind.

In the past, the time-measurement combination was a linear sequence (Lerup 2016), defined and generated by settlement rules commensurate with the territory's morphology. It established a mutual balance between resources and settlement dynamics, where time allowed gradual and subsequent adaptations.

Unfortunately, this union can no longer be founded in today's metropolises. The dynamic transformation of the contemporary city now goes beyond the morphological relationship that has guaranteed its sustainability and environmental balance over time. Today its evolutionary relationships are increasingly linked to tangible and intangible infrastructural networks.

The disconnection of these two elements, in turn, is linked to a comprehensive system of land use and disuse that constitutes a fabric of variable size, which generates different forms of development (Bélanger, 2012), keeping together the multiple monofunctional centralities of the contemporary city.



The urban ranking and the measure of the project's effectiveness for sustainable cities

In a variable layout context, one of the main problems in verifying the sustainability of the architecture, landscape, and infrastructure project is identifying actual measurability elements as similar tools to indicate tangible and intangible climate change mitigation effects. This measurement and scale issue is crucial in developing sustainable systems and the overall sustainability of different territories' actions. One of the main problems encountered when participating in the H2020 Climate Change calls was measuring the proposed solutions' effectiveness in terms of improvement. For buildings and small neighbourhoods, different systems for evaluating the results of the use of ecological techniques play an essential role (Georgoulias 2012) thanks to a fruitful collaboration between designers, companies producing sustainable materials, public administrations and citizens, facilitating the adoption of a sustainable design (Georgoulias 2012). For urban and infrastructural spaces, this still seems complicated, both in terms of a problem of scale and the number of factors to consider: urban density, traffic, use of different parts of the city, long response times and the activation of regeneration, implementation and, therefore, monitoring procedures.

In the urban design field, measurable factors are very uncertain and not directly derivable from it. We can have secondary indexes such as construction costs and management of NBS strategies. It is necessary to ask other disciplines to verify the scientific results listed in the implemented systems, such as reducing pollutant variables, heat and dispersion, etc.

The construction of research on the measurability of the effectiveness of the architectural design

Often, multidisciplinary methods and inputs that use indicators and measurement criteria to assess proposed solutions' effectiveness are far removed from architectural and urban design.

Evaluating the environmental performance of urban projects with points and thresholds to raise user awareness (Montalti 2010) is more complicated. The environmental cost is not directly referable to the individual user in the form of a bill. Therefore, it is not possible to increase awareness of the need to save resources. This cost is significantly different depending on geographical contexts. Contemporary design tends to generalise with few concessions to a regionalism necessary to ensure adherence to the proposed solutions' context and effectiveness.

In the age of globalisation, the inexistence of architecture to design cities is now evident. Still, nature increasingly reminds us of how it belongs to places. Nowadays, the rootedness of uses, functions, and relationships clarified the need for design to work in tune with the physical and social context.

Every moment of crisis of any kind, and never as we currently see

it, leads us back to the need to reactivate «such an attitude is as reactionary as it is perverse given that responding symbiotically to the exigencies of both climate and context has invariably served as a mainspring for tectonic invention since time immemorial» (Frampton 2007: 178) thought, which puts the demands of living before those of global interests. It is no longer thinkable to carry out necessary changes on registers that do not consider nature, the inhabitants, those who live more or less urbanised areas every day.

In this temporal dimension, therefore, there is a physical measure of urban and infrastructural space where, generally, the design of this scale is devolved to specialised engineering skills in its various variants: environmental, management, etc.; therefore, it is rarely brought back to the field of architectural design which could harmonise and translate instances and technologies in the context

It is not only an aesthetic problem, and it is essentially a problem of quality of the process and adequacy to the social needs of each site that is subject to design. Some methodological aspects indicated by various research programmes such as the Zofnass Program for Sustainable Infrastructure, Harvard University, 2008 seem attractive. Above all, the synergy between scientific research, actors and associations can indicate a profitable interaction at different levels.

Bringing it back to the European dimension can introduce intense criticism elements, especially in our cultural context. The research process represents them in the project and the techniques of mitigation and adaptation to climate change. The architectural research design is far from a current operational practice that often confronts design without research. In this context, the proposed research experiences have shown that the possible involvement of active partners, both in terms of design and strategies to develop a methodology, starting from shared scientific data, open up to a different approach to urban design, but also the importance and codification of the results achieved. The Polimi Research Group 1 carried out a direct experience in the International Workshop *The City of the Future*. The workshop, organised by TU Delft/DIMI (Delft Deltas, Infrastructure & Mobility Initiative) and BNA (The Royal Institute of Dutch Architecture), brought Italian and European universities together.

The main work was to interpret the municipalities' different urban agendas involved through a synergy between the practitioners and researchers. The methodology proposed in the project was to identify actions and forms of the design at different scales, within a circularity of data, activities and configurations of portions of cities, infrastructure systems and individual buildings or elements of public space constitution. The intention was to define a virtuous process deriving from the principles of the circular economy, so the proposal includes specific actions to reinterpret the existing and regenerate it in the direction of a combination appropriate for dealing with behaviours and ways of using the city in the Climate Change era as a preventive strategy.

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Towards a research perspective

It would be helpful to open the experimentation to contexts where climate change seriously modifies urban, social, economic and environmental structures. NBS solutions can and must operate to support very different climates, scales, social and economic contexts. Climate change, in the global context, takes on many aspects. Western urban contexts adapted some NBS solution techniques, such as green roofs, vertical forests, water tanks, rainwater collection, etc. They represent sophisticated and intelligent systems regulated by measurement and management control tools. In different contexts, such as in the Third World's endless megalopolises, the effects of climate change on variations in environmental conditions amplify the impact on populations already living at the edge of survival. It becomes necessary to work. It needs a direction in which architectural and urban design is responsible for low-cost, quick, and easy-to-implement design quality. By focusing on this aspect, it could, in a way, help to identify strategies that can support the reduction of climate change phenomena, often the cause of the land collapse and social inequalities. At different levels, the incidence of climate change has other effects depending on latitudes. In Europe, we have many problems than those South of the equator, which is an essential difference that research with other partners must consider. The construction of open and inclusive research networks can identify measurement methodologies concerning design techniques, indicating possible strategies between applied design and the effectiveness of models in the field. Testing and prototyping can open unexpected synergies with operators and administrative institutions. And on this point, it is hoped that the performance to be measured and the technical performance can also have achievable and measurable cultural objectives.

More specifically, operating through research by design strategies can be an opportunity to implement scientific tools for measuring results by identifying parameters related to improving well-being, reducing conflict and the incidence of changes in behaviour and perception. Developing specific learning processes for students implemented through research implies direct involvement in experimentation, approaching cities' transformation practices, and inserting them in suitable professional circuits (Arup 2016) in a circular economy concept where education and training become part of the process.

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