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DIPARTIMENTO D'ECCELLENZA FRAGILITA' TERRITORIALI 2018–2022
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University of Ljubljana

Warsaw University of Technology

National Technical University of Athens

Viewpoints

III. Reflecting on Practices

Viewpoints

IV. Didactic experimentation

DESIGN ACTIONS FOR SHIFTING CONDITIONS A PREMISE

Fabrizia Berlingieri, Roberto Cavallo
Emilia Corradi, Hans de Boer

A spatial lens on Climate Change dynamics in urban transitions

Considering the growing importance that the urban environments assume within contemporary territorial transformations yet little room is offered within market-driven societies to critically reflect the spatial impact that cities face *vis-à-vis* the urgencies for environmental rebalancing. It embraces a wide range of phenomena we all live and experience nowadays, not only incidentally but more in a structural way, forcing us to rethink our present state and explore futures. Transitions embody the fluctuating form of late capitalism with its raisings and disruptions. Regarding the environmental conditions, they are affecting the world regions' habitability, the phenomenon of progressive urbanization versus agricultural land abandonment (UN 2018). With these premises, transitions seem to be a proper reference for an interdisciplinary and conceptual frame addressing the transformation of urban and metropolitan contexts, which will be the leading players for the coming decades.

Design Actions for Shifting Conditions (DASC) is a collective and plural attempt to deepen the perspective around transitions from a spatial lens of observation and enforce the critical discourse around contemporary urban and architectural design topics. Moreover, it aims at broadly discussing the methodological approaches that architectural and urban design – between research, education, and practice – are currently testing for rewriting the urban dynamics and their ecological footprint. This process has a significant implication in reconsidering the city's image as we know it, with a particular reference to the European legacy of XX century urbanization. It, according to Iturbe, embodies "a complex network of interlocking carbon forms, each of which replicates the myth of a limitless supply of energy and resources characteristic of a carbon-fueled culture of abundance" (Iturbe 2019, 36).
The urgency to turn the XX century paradigm of unlimited resources must not be solved by technical responses. More profoundly, it must challenge the opportunity to investigate and deepen the consequences of a paradigm shift, in a broader sense, addressing topics like aesthetic perceptions, new physical structuring, and social fruition of contemporary public spaces (Bulkeley 2003). New natural spaces, technologically advanced mobility, ecological

corridors, and smart infrastructural grids, reuse and flexibility characterize the future transformations of the built environment, challenging traditional and sectoral approaches applied in the past and even nowadays. New conditions are flickering irregularly, weakly, or strongly as autonomous events or policy initiatives, getting ground to initiate (some) change. Requirements from the past had defined solutions from the past. Some were pretty successful, replicated at a larger scale, and even crystalizing in a paradigm. However, will paradigms from the past still be viable and feasible for the future? Will the derived methods and strategies still be valid? Can we detect patterns of emerging issues and solutions for reviewing and intervening in the built environment? Will the transitions be the new conditions, or are there other conditions forcing us to rethink familiar approaches and strategies?

Systemic changes and paradigm shifts are two sides of the same medal. A different paradigm expresses different values and gives clues for a different design experience. In the end, the original system, firstly defined as the dominant paradigm, gradually changes to another one, set as a hypothesis by early precursors and expressed by small-scale interventions, eventually leading to a new paradigm. Then the appearance of the new paradigm influences further developments for practice, which could spread under policymakers, professionals, academics, and students. Numerous examples refer to architecture and urbanism. The 'Garden city,' 'Edge city,' Linear city,' 'Smart city,' or 'Urban metabolism' are all examples of established paradigms with remarkable metaphorical quality and a specific perspective, evoking a more comprehensive image due to its analogy with already-known experiences.
The notions of *ville* and *cité*, as discussed by Sennett, are meaningful metaphors here: the ville being a representation of our built environment with its buildings, pavements, streets, squares, parks, waterways, and leftover space; the *cité* as a representation of our use, and physical and emotional experience (Sennet 2018). The top-down and 'form-follows-function' planning of the *ville* in the age of modernity brought efficiency and prosperity and created 'infrascapes,' with negative social and environmental impacts for the *cité*. The city makers of the *ville* (urban planners, architects, engineers, policymakers, advisors) should interact more with the city makers of the *cité* (residents, local businesses, visitors) to co-design and co-create public spaces with both environmental as well as social qualities.

The need for a broader engagement

DASC constitutes the first step to wrap up and reflect on the actions – workshops, seminars, and research experiences – that have matured along with the biennial cooperation between European universities,

research, and professional institutions. The consortium includes six partners from academic institutions: Delft University of Technology, Politecnico di Milano, University of Ljubljana, National Technical University of Athens, Warsaw University of Technology. The consortium has also involved several professional institutions such as the Royal Institution of Dutch Architects (BNA), the Professional Practice IFLA Europe and PHALA associations, the Society for the Environment & Cultural Heritage (Elliniki Etairia), together with the respective municipalities, i.e., the Città Metropolitana di Milano and the Municipality of Rotterdam. Initially, two research activities were the main opportunities to form a diversified group capable of developing a broader and more representative platform for discussion about the forces – and the actors – involved in the dynamics of contemporary urban transformations.

The two research activities were carried out under the umbrella of Horizon 2020, setting a collective calls' participation. In the first research proposal, 'City Making in Times of Transitions' (CiMaTra)[1], the main research question was formulated on transforming an 'infrascape' into a 'socioscape'. Infrascape, as a representation of a dominant occupation of large (infra)structures within a particular area, should free up space for developing an attractive public space as part of a future-proof living environment, including technical and ecological measures for reducing the effects of climate change. 'Turning Neglected spaces into active social and environmental resources through Nature-Based Solutions' (TuNeS)[2] is the second collaborative research proposal. It envisions a pivotal model for design guidelines about the regeneration of neglected open spaces, explicitly addressing them as leftover areas of 20th century urban development. These areas, embedded in the urban pattern, have been considered from spatial and social design perspectives as high potential areas for eco rehabilitation. The main objective was to demonstrate their potential for resilience and adaptation to climate change while considering sustainable planning principles and the urgent need to improve the quality of life in today's urban systems.

Alongside the research experiences, the comparison between the partners on the issues of urban transition and the spatial impact of Climate Change dynamics has also been fostered in teaching activities through the shared experience of the international workshop 'Stad van de Toekomst/City of the Future' in 2018[3]. The design research project, initiated by the BNA (The Royal Institute of Dutch Architects) and the TU Delft DIMI (Delft Deltas, Infrastructures & Mobility Initiatives), was based on a central question. How can we design and develop an urban transformation in an integral way into an attractive and futureproof urban environment?

[1] The CIMATRA consortium was composed by: Technische Universiteit Delft (Nl); Universiteit Antwerpen (Be); Politecnico di Milano (It); Univerza V Ljubljani (Sl); Politechnika Warszawska (Pl); Bond Van Nederlandse Architecten Bna (Nl); Vereniging Deltametropool (Nl); Gemeente Rotterdam (Nl); Stad Antwerpen (Be); Città Metropolitana di Milano (It); CCL Consorzio Cooperative Lavoratori (It); Fondazione dell'Ordine degli Architetti P.P.C. della Provincia di Milano (It); Field Factors Bv (Nl); National Technical University of Athens - Ntua (El); Elliniki Etairia Society For The Environment And Cultural Heritage (El); Municipality of Perama (El); Mestna Obcina Velenje (Sl); Metro (Sl); Zavod Za Prostor Savinjske Regije (Sl); Miasto Stoleczne Warszawa (Pl); Towarzystwo Urbanistow Polskich (Pl); Oddzial Warszawski Stowarzyszenia Architektow Polskich (Pl).

[2] The TuNeS consortium was composed by: Politecnico di Milano (It); Facultad de Arquitectura Diseno y Urbanismo Universidad de Buenos Aires (Ar); Universidad de Mendoza (Ar); Parco Nord Milano (It); Progetto Natura Onlus (It); CasciNet società agricola impresa sociale (It); Technische Universiteit Delft (Nl); Univerza V Ljubljani (Sl); Municipalidad de Vicente Lopez (Ar); Pososki Razvojni Center (Sl); Universidad San Francisco de Quito (Ec); Secretaria de Ambiente y Ordenamiento Territorial (Ar); Universidad de Cartagenaco (Co); Provincie Noord-Holland (Nl); Fundación Verde Milenio (Ec); Municipio de Quito (Ec); Gobierno Autónomo

The biggest cities of The Netherlands – Utrecht, Amsterdam, Rotterdam, The Hague, Eindhoven – were identified as testbeds. Each of these five cities appointed a 1 x 1 km transformation area to be analyzed, researched, and designed by two interdisciplinary teams of architects, urbanists, city planners, visionaries, engineers, and sociologists. For the five cities, ten multidisciplinary teams of practitioners have been fully involved in the project. In addition, the same tasks have been assigned to more than 50 students from different universities, working together in a workshop at the 16th International Architecture Exhibition in Venice, discussing and presenting the results to a broader audience.

In 2019 the last occasion of deepening positions and topics related to urban transition was the international seminar 'Design Actions for Shifting Conditions' hosted by Politecnico di Milano, the Department of Architecture and Urban Studies and the research cluster 'Territorial Fragilities'[4]. With the participation of the entire board of the consortium partners, the seminar has been articulated in three moments. The first one consisted of the open symposium, engaging the audience through the topics here presented in the book. A second moment was reserved for comparing students' works between the two universities of Politecnico di Milano and TU Delft with a field trip on the ongoing areas of urban transformation in Milan. Finally, the third moment was dedicated to an internal consortium discussion about future opportunities and projects to be carried on.

A triple helix approach

The book presents a collective reflection embracing several institutions – the consortium – to enhance knowledge and impulse the ongoing international debates by proposing shared methodologies and interdisciplinary perspectives. The urgency is to foster a shared action regarding the effects of climate change and how we are reshaping our collective urban imagery. An integrality of vision is required, whereas the complexity of reality corresponds to an equally strong specialization of knowledge. The integrality of vision poses the design disciplines as open and hybrid spheres of expertise at the centre. Moreover, it implies a close relationship between research, practice and education, which we define as a triple helix approach. The book's primary rationale is bounding three sections – namely about Research, Education and Practice – where different positions mix themselves, provoking unexpected matches and suggesting further developments.
The strong interrelation between these three components must make use of a degree of transdisciplinarity able to answer the different aspects that affect transformations, such as social, economic, environmental, cultural, legislative, and technological issues. Hence the perspective of intersecting, in the research path,

Descentralizado Municipal de Santa Cruz (Ec); Instituto de Patrimonio y Cultura de Cartagena de Indias (Co); Departamento General de Irrigación (Ar); Municipalidad de Guaymallén (Ar); Municipalidad de Maipú Municipality of Bovec (Sl); Universidad de los Andes (Co); Secretaria Distrital de Planeación (Co); Bermudez Arquitectos (Co).

[3] The International Research by design Workshop 'Stad van de Toekomst / City of the Future' was organized by TU Delft/DIMI (Delft Deltas, Infrastructure & Mobility Initiative) and BNA (The Royal Institute of Ducht Architetcure). The participant universities were TU Delft, IUAV Università di Venezia, Politecnico di Milano, Università della Calabria, Università Roma La Sapienza, and the Rabat University.

[4] DAStU is one of the Italian departments selected and financed by the Ministry of Education, Universities and Research (MIUR) for the period 2018-2022 as part of the 'Departments of Excellence' initiative (L. 232/2016) with the project "Territorial fragilities". In the five years 2018-2022, the Department of Architecture and Urban Studies promoted an interdisciplinary set of researches on exploring the complex and multifaceted processes of the weakening of the relationship between space and society, looking at it in terms of exposure to multiple and diverse risk factors: environmental, social, economic, political and institutional.

different expertises is an attempt to contribute from time to time to raise the level of interaction on design transition towards a sustainable future. Each thematic cluster could trigger a further level of in depth analysis and, therefore, an increase in the degree of complexity. All this is essential along with the participation of the communities, capable of expressing themselves through the municipalities, the associations, with which research, practice, and education can build a path of exchange full of opportunities. This continuous exchange must be supported through research by design, in which simulations, thanks also to digital technology, can deliver a virtually real and measurable dimension of the impacts of actions concerning urban mitigation and regeneration processes.

Developing appropriate paradigms, carrying strong symbolic quality in capturing essence as well as complexity and referring to possible implementations and best practices could contribute to further dissemination and eventually to actual changes also at a large scale. The aforementioned interrelationship between systemic changes and paradigm shift strongly resembles the way scientific knowledge develops. Whereby some theory, model or pattern, underlying assumptions and beliefs, part of a particular paradigm adopted by a scientific community, doesn't explain or solve emerging issues and problems acceptably. The same happens in the case fragmented pieces of information challenge the present paradigm. With more parts of the puzzle, a coherent perspective and new paradigm could arise where more adherers investigate the recognized elements and start searching for more pieces and information, collecting new insights, developing methods, and producing new knowledge. Defined as a scientific revolution, a new paradigm should be characterized by two criteria: 1) attracting scientists away from competing modes of scientific activities and 2) being open-ended for a redefined group of scientists to resolve all sorts of problems (Kuhn 1962). When substituting science with design, which also has an academic tradition for explaining developments, developing theories and concepts, and testing them with experiments, then the analogy is clear. In other words, new conditions challenge present design actions for another perspective and inherent actions concerning the built environment in the context of the multiple issues and transitions related to climate change.

The seminar organized by Ilaria Valente, Fabrizia Berlingieri, Marco Bovati, Emilia Corradi, Cassandra Cozza is part of the activities and topics addressed within the project "Territorial Fragilities". The seminar 'Design Actions for Shifting Conditions', hosted the contributions of: Fabrizia Berlingieri, Marco Bovati, Roberto Cavallo, Emilia Corradi, Cassandra Cozza, Hans de Boer, Elena Fontanella, Agim Kërçuku, Fabio Lepratto, Michele Morganti, Thanos Pagonis, Giulia Setti, Krystyna Solarek, Ilaria Valente, Špela Verovšek.

So many questions must be answered to get some sight and grip on this complexity of multiple issues, disciplines, scales, contexts, dimensions, and stakeholders. However, there are already several clues to investigate to find patterns leading to new paradigms that can steer research and education. Approaches like 'Research by Design' and 'Integrated Design', adopting a multidisciplinary perspective, seem promising to figure out which solutions could evolve as a paradigm that, in the end, could inform professional

practitioners, students and academics for their designs. However, new paradigms and approaches need to be developed, defined, tested, validated, improved, and disseminated. Emerging issues and climate-change-induced transitions are challenging existing systems. Apart from technological development (in laboratories), their impact burdens the built environment, as a static representation of the city (real world), and the urban system as its dynamic translation. So, co-learning and co-creation by practice and academia are inevitable the keys for knowledge production needed for developing new paradigms and proper approaches.

Introducing appropriate paradigms and a clear perspective and practising with systematic approaches for students can be helpful. Understanding issues, challenges and their environment, the related theoretic notions, stimulating an analytic attitude for developing positions and inherent arguments, contribute to developing design competencies of how to phase implementation for both the spatial and the temporal context. Education also provides relevant clues to research, which should address and take care of paradigms, system perspectives, and methods. In the manifest about 'Research by Design' formulated by the European Association Architectural Education, it is clear that the relationship and interaction between academia and practice are essential, as also addressed by Agyris and Schön (EAAE 2012). An ongoing exchange of insights, thoughts, and experiences could stimulate and develop both academics and practitioners in their quest for explanations and solutions for actual issues and challenges rooted in society. This relationship could deliver the first pieces of patterns evolving into paradigms, generating starting points to develop methods that could be tested and applied firstly within education, both for training student competencies and as tools for practice. Additionally, the practice itself is also developing methods or design strategies in the context of emerging issues and climate change-related transitions which will take place in coming decades. Why not explain and codify them by academia and present them to students to provide insights into their forthcoming practice?

With climate change and its induced transitions, the present system state is challenged, requiring measures for mitigation and adaptation related to particular system components. Both an integrated and multidisciplinary approach and a systems perspective are needed for addressing emergent issues and urgent transitions.
Ahead of these activities, new paradigms are needed to provide direction and prospects for action that should be valid and effective for decades, including its flexibility to adapt to different scenarios. There is no overarching paradigm but a set of interrelated paradigms so that a more holistic approach should be considered. It requires a mind shift from the present dominant paradigms and the level of consideration and reflection. Within its broader

paradigmatic context, a new paradigm could guide smaller steps of archi- or infra-punctual interventions creating new conditions and leading to a stepping stone or upscaling for further interventions, giving expression to the new paradigm. Best practices could stimulate further development, dissemination, and adaptation of new paradigms, which could evolve into dominant and widespread paradigms for the public and private sector. Knowledge institutes like universities should be at the forefront of identifying, interpreting, developing, validating, and educating new paradigms and related principles, strategies, and methods from an integrated approach.

How to develop both an integrated and multidisciplinary approach and a systems perspective, bringing forward and testing the socioscape paradigm for transforming existing public space or creating new public space? How could this lead to adaptive design and implementation strategies anticipating trends and valid for different scenarios? How to involve education and practice to exchange, co-create, co-produce and disseminate new knowledge for design, engineering, governance, and policy? Physical structures, objects, and networks are seen as the domain of civil engineers or architects. Their planning and integration are the field of spatial planners, urban designers or landscape architects, depending on the scale and spatial context. Transport planners and traffic engineers take care of flows and capacity. Policy advisors and makers address societal issues related to those systems and their actual performance. During education, students should experience collaboration in projects with other disciplines addressing actual assignments containing many problems associated with the factual situation in the context of the different transitions. Actual tasks and interactions create awareness and enhance mutual understanding between students of different disciplines. The agenda is set by societal and sectorial actors where professional practitioners in public services or private firms act as the experts for addressing issues and solving problems. These professionals are educated by knowledge institutes and are applying the formal knowledge out of their instances. They learn by experience, producing knowledge and shaping practice when they are confronted with all kinds of issues (Gibbons 1994, Argyris and Schön 1974). To be successful, an open mind attitude is crucial to collaborate with other disciplines, learn, and reflect on the way of learning. Next to the multidisciplinary collaboration within the institution, a knowledge institute needs to interact with professional practice. Not only for understanding which graduates practice needs but also for knowledge production in a collaborative way. Although multidisciplinary collaboration outside architecture and its flanking fields is not explicitly mentioned, the Charter addresses most of the argumentations discussed above on Architectural Research by the European Association for Architectural Education (EAAE 2012).

Contributions and emerging topics

The book's articulation follows a methodological tripartition according to the triple helix approach of Research, Education, Practice. However, several central topics transversally emerge.
The first one refers to the challenge of a profound paradigm change on the city project. Although several contributions within the three sections constantly underline it, it is deepened according to various inflexions. For example, the contribution 'The need for a paradigm shift and integrated approaches for a future (proof) built environment' (de Boer, 37-51) considers the topic a central conceptual node in design practice and the scientific field. Urban densification, set by the need for housing within city borders and the necessity of reducing the effects of climate change, produces a new mobility paradigm that could trigger a cascade of spatial opportunities like the transformation of public spaces in inner cities districts around transport nodes. Also, transport infrastructure interventions like a cover-up or going underground for connections gives spatial opportunities.
The paradigm change is also addressed in the contribution 'Design Strategies for Urban Renaturation' (Berlingieri, 123-129) with a specific reflection on the theme of open and public space through a review of contemporary practices almost on the border between architecture, art, and technology. Infrastructures, abandoned areas, industrial fragments, interstices, and residual spaces can offer opportunities for regeneration in the direction of sustainability.
It is necessary to ask whether it is possible to start a revision process regarding tools, methodologies, and approaches. Moreover, many renewal actions concerning degraded public spaces are often hindered by the lack of funding, affecting, even more, the possible results often relaunched downwards to the possibility of experimenting with genuinely innovative solutions aimed at an actual transition towards a sustainable city. A third conceptual reflection is present in the contribution 'We should not stop looking for beauty' (Bovati, 226-229), closing the didactic experimentation section. The examination outlines a more critical approach and the need for greater cultural awareness and complexity in the design approach. Rethinking the role of designers becomes a priority to address the weight that policy choices can have for design, thus becoming an opportunity for reducing conflicts and (social) inequalities. It also addresses the emergent economic processes of recycling as an applicable current practice, not only to individual buildings but to entire systems or parts of cities so that the transition from one scale to another of decisions, choices, and design processes, can find an effective circularity. For example, it is essential to understand the relationship between urban form and its transformation through different scales to understand possible permanency and the potential for change or recycling. It implies a new perspective on evaluating the traditional city.

A second transversal topic that emerges from several contributions regards the design methodologies within the scientific and innovative research framework. In specific, the reflection 'Architectural Design in an unprecedent time' (Corradi, 31-35) develops around the concept of measurability of impact within the design process as an innovative and challenging approach. It addresses the necessity to start a research path that somehow holds together the different aspects, from participatory to digital. The idea of transition then applies also to design processes by innovative use of mapping tools and technologies, of virtual projection over time and physical planning, of access to EU funding programs, but above all of sharing of experiences to broaden the demand for sustainability and give adequate responses to the adaptation of cities and communities to climate change. Two other contributions underline the critical role of data analytics: 'Transition in urban analytics, insight into research' (Verovšek, 53-59) and 'Demographic fragility' viewpoint (Kërçuku, 68-73). They both deepen the growing role of data in urban design decision processes and research, predicting or addressing specific challenges in spatial design and impacting societies' projections. Within this topic, on innovating design methodologies in practice and research, a particular focus is given to conceptualising of design tools and approaches by the contributions' Specific/Generic, Disciplinary/Interdisciplinary. Two remarks on architectural and urban design's perspectives for shifting conditions' (Fontanella, 62-67) and 'Adaptation and Resilience. Architectural Design Tools between Uncertainty and Transitory' (Setti, 74-79). Interdisciplinarity and knowledge intersections are key points of innovating common frameworks in design discipline by developing and analyzing emergent concepts such as adaptation and resilience.

Within the section 'On (design) Education', the first three contributions state the urgency to reposition the academic teaching paths at the centre of "enlarged" decision-making processes within the section' On (design) Education'. The contributions promote an increasingly clear trend to train new practitioners as a critically aware future generation of architects by strengthening a more robust continuity between education and research. Specifically, 'City Making in Times of Transitions. The central role of learning' (Cavallo, 85-89) contributes to the reflection on the mutual exchange between education and policies sectors within the current frameworks on sustainable development promoted by the European Green Deal and the New Bauhaus initiative tracing alternative trajectories for future changes in urban systems. In the text 'Urban Design between culture, nature and society' (Solarek, 91-95); instead, the accent is placed on the need for enlarging the contemporary decision-making platforms, where education promotes project sharing processes, especially with the enhancement of the social sphere. This perspective frames future generations as mediators of common urgencies, a

problematic position that needs more codification within increasingly complex urban metabolisms. Finally, the third opening contribution of the section 'Paths for research and didactic experimentation' (Valente, 97-99), in continuity with the previous ones, exposes the interplay between education, research and practice as a pedagogical and innovative method to draw continuous nourishment for the development of design topics and professional figures. As further explications, the contributions '(Re)designing urban Network Space for cite Versailles Brussels' (Ilsbroekx and van Acker, 102-107), 'Turf wars and Beyond: Plac Defilad in the hands of local stewards' (Filip, 108-111) and 'Recuperating the coastline of Athens as public space' (Pagonis, 112-117) offer interesting viewpoints starting from concrete and innovative teaching experiences on urban areas. The port area of Athens as a public space, the infrastructural framework for new soft mobility in the Cité Versailles in Brussels, and finally the space of the square as a theatre for the social engagement in the case of Warsaw, are three examples in which the training activity mediates different actors and socioeconomic issues.

The third section, 'Reflecting on practices', exposes the ongoing change of perspective on the role of architects. For example, the contribution 'Notions from practice: Research by Design as a stepping stone for implementing integral forms of spatial design' (Hinterleitner 131-137) explores several design studies based on Research by Design. It is represented as a key method within a transdisciplinary context regarding societal issues, and climate changed-induced transitions within the built environment's spatial context. Especially practitioners are developing new insights and design strategies where students in parallel are training their design competencies on the same cases. These studies and results can be a rich source for academics to review and study to discover and enlighten evolving models or patterns, leading to a new paradigm for the built environment. Learning by doing practice also offers a new experimental field for academic research in its interrelation with policies and urban transformation management processes. The same topic is explicit in the contribution 'Academic research in the Arenas of practice' (Pogliani, 139-143), reversing the point of view on the interplay between academic research and the contemporary trajectories of urban transformations induced by the public sector. Again the viewpoint section presents three contextual readings regarding the case of the Segantini Park in Milan (Cozza, 146-151), or the national Life IP program (Lazoglou, 152-155) and the landscape design policies promoted by Phala association (Gkoltsiou, 156-159) in the Greek context. Finally, the last book section, 'Didactic Experimentation', presents a plurality of Master students' projects to compare design for transitions approaches directly from the perspectives and positions that four different architectural education programs have developed.

Design is a powerful competence for both the exploration of future opportunities for spatial transformations and its possible impact under uncertain conditions for the synthesis of objectives and functions, considering a multitude of contexts related to actual assignments. The need for innovative integrated approaches emerges as a *fil rouge* through the contributions enlightened by diverse perspectives. Moreover, this rich variety of positions aims to understand and address the complexity of the present state and the plural framework of transition in the built environment through a more dynamic representation of current urban conditions. Setting an education and research agenda for applying and developing methodological approaches and system perspectives, like 'Research by Design' and 'Integrated Design', could contribute to awareness and the dissemination of design actions for shifting conditions. What role could universities take when overseeing the developments concerning the urban system and the built environment in the broader context of climate change and induced transitions? The current and future challenges seem to be a wide window of opportunity for the design, engineering, and policy disciplines. Not in a traditional way to react and act but at least from a multidisciplinary perspective heading to the same thematic crossroad. Due to the transdisciplinary nature of developments and challenges, collaboration with practice is critical for learning and developing innovative research paths. Moreover, it represents a key for developing a shared framework for mutual understanding, knowledge development, and open dissemination.

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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' well-being 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.

←

Dekakker rooftop
ZUS, Rotterdam 2015.
(photo F. Berlingieri)

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 Group1 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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THE NEED FOR A PARADIGM SHIFT AND INTEGRATED APPROACHES FOR A FUTURE (PROOF) BUILT ENVIRONMENT

Hans de Boer

Introduction

This contribution is on the basis of the experience, projects and programs related to the DIMI-theme Future (proof) Built Environment & Urban Infrastructures, initially started in 2009 with a focus on water and transport infrastructures but gradually moving to a broader spatial context of the built environment. Many disciplines are involved, like architecture, urbanism, landscape architecture, transport, governance and policy. DIMI promotes and facilitates integrated and multidisciplinary approaches, the relationship between education and research, and focus strongly on societal issues and collaboration with societal stakeholders. Firstly, a concise overview is given with some broad brush strokes indicating some relevant development phases in the water and transport infrastructures in The Netherlands. The water infrastructures are more specific and related to the geographical conditions of The Netherlands, while transport infrastructures are more generic in the context of the development and growth of Western economies. Secondly, the nexus of emerging issues related to growth and system limits and the challenge by the effects of climate change, ask for reflection and reconsideration of present policies and practice. Are there already patterns of change visible, as evolving paradigms that could gradually replace dominant paradigms, which could lead to new directions and a way out of the present state of affairs to a more future-proof built environment?

Phases of development in the domain of transport and water infrastructures in the Netherlands

Societies and economies highly dependent on all kinds of infrastructures for transport, water, energy, communication and data. Its development contributes to the wellfare of countries and its ability to perform within an international and global context. When looking at the global competitiveness of countries, infrastructure is one of the pillars to rank them, next to institutions, ICT adoption, macroeconomic stability, health, skills, product market, labour market, financial system, market size, business dynamism and innovation capability (Schwab 2019). High ranking countries have all extensive, available, reliable and efficient transport and

Madrid Rio Project – (photo: West 8 architects)

utility infrastructures. As merit goods, mainly governmental bodies on several administrative levels are responsible for investments, development, operations, and maintenance to facilitate social and economic functions and activities.
When narrowed down, the type of infrastructures that have an environmental and spatial defining impact and footprint than transport and water infrastructures are foremost and globally recognizable.

Transport and water infrastructures

When focusing on transport infrastructures, they all have physical characteristics and a spatial context depending on their function and location within the particular network and related scale(s) (Figure 1). Large infrastructures like (sea)ports in deltaic areas and international airports are comprehensive systems in themselves with a typical governance structure, industrial and/or commercial functions, extensive supportive facilities and a large spatial footprint. This latter, both in a physical sense, due to its size and an environmental sense, due to its impact on a larger scale concerning safety, noise, emissions and smell. Infrastructures like roads, railways, waterways, tunnels and bridges are vectors for destination points where stations and transfers act as nodes integrating networks of different modalities.
In the Netherlands, flood barriers like dikes, dams and movable barriers have a special meaning due to the geographical location at sea and as the delta of two large rivers with 35% of land below sea-level where several highly urbanized major economic regions are located (Leenaers 2013).

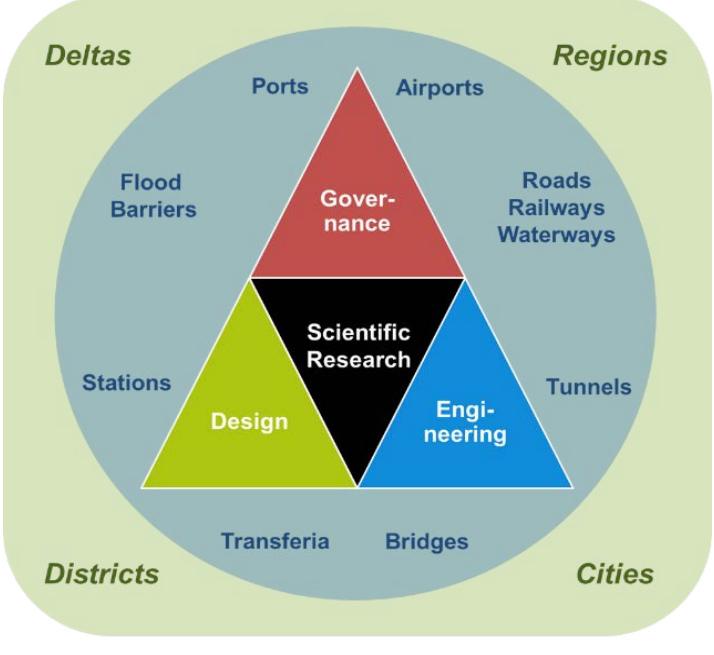

Figure 1 – Transport and water infrastructures, spatial context and knowledge domains.

Due to its nature, context and impact, several knowledge domains are related to the development, operation and maintenance of transport and water infrastructures. As merit goods and public ownership, disciplines like economics, governance (public administration, policy sciences) and law are relevant. As artefacts and structures, a broad range of design and engineering disciplines are relevant like road design, structural design, architecture, urban design, landscape architecture, structural engineering, transport engineering, geo-engineering, etc. As a mean and facility, a range of interdisciplinary disciplines are relevant like spatial planning, transport planning, logistics, operations research, etc.
The formal body of disciplinary knowledge is largely defined by scientific research where international peer reviewed journals are the main medium to publish insights, findings, conclusions and notions on the basis of empirical observations and data. The different meanings and specialized knowledge from these disciplines reflect its complexity for common understanding, addressing issues and collaboration. This complexity gets an extra political dimension when considering the high public investments, complicated and judicial tender procedures and contracts, and inherent risk accountability, which could lead to serious conflicts and disputes between commissioners and constructors, which hampers realization and cause significant budget overshoots (Berg 2020).

Growth and expansion

As economically developed country, the Netherlands is (also) facing the effects of the ongoing (sub)urbanization, individualization, consumerism, mobility growth and inherent environmental pressure. This is strongly related to population growth, economic progress and democratizing since the post-WW2 period characterized by urban sprawl, vast commuting, growing car ownership and transportation of goods.
For The Netherlands, the period 1959-1973 has been characterized by a phenomenon of mass motorization resulting in traffic growth, road construction and car ownership[1]. After the oil crisis of 1973, road construction for the national highway road system had slowed down due to a change of public opinion, social resistance, completeness of the network, and environmental pressure. However, cars' growth rose to 8.531.000 in 2019, while this number was 2.810.000 in 1973 (Autosnelwegen 2021, CBS 2019). Ultimately, leading to a congested highway road system, crowded inner-cities and polluted living environments by emissions and noise. In 2020 the total length of roads was 141 361 km, whereby the national highway system has a length of 5 504 km, which is 3,9 % of the total length. For municipalities and waterboards, the total length is 128 041 km, 91% of the total length (CBS 2020).
Public transport evolved more moderately by adding railway lines for mass transport between cities and regions and metro and tram lines for large and medium-sized cities. Being more efficient than

[1] After this period of growth and expansion the national governance of spatial planning was decentralised to other governance levels like provinces and municipalities from the nineties up until now, while infrastructure development and maintenance for the national transport and water networks are still on national level.

car use, but its exploitation depends on sufficient demand, capacity utilisation and governmental subsidies (Baggen and Van Ham 2019). The total length of railways is 3041 km in 2020 (CBS 2020). When looking at the use of public transport on a daily basis of at least one trip, only 8,6% of the traffic participants in 2019 use this transport mode (CBS 2020).

In the domain of water, infrastructures, especially rivers and canals, are in use for transport. Sluices and floodgates manage height differences and the draught of ships with different sizes and loads to facilitate barges' navigation from (sea)ports to the hinterland and vice versa. Canals, *boezems* and ditches and pumping stations are mainly for water management of the different water levels preventing inundation of polders, mainly in use for agriculture and farming, and the built environment. Dikes and dams are mainly for flood protection and were already there from the middle ages, which are reflected in city names like Amsterdam and Rotterdam (Meyer and Hoekstra 2020).
To protect the Netherlands, there are in total of 3.700 km of flood defences (Rijkswaterstaat 2021) and 6297 km of waterways to have an indication of its relevance and magnitude (CBS 2019).

Consolidation and reconsideration
For many decades transport infrastructure development had followed and facilitated growth to maintain accessibility and control loss of travelling time and related costs. The national highway network mainly facilitates accessibility to regions and cities with more lanes and signalling systems for maintaining efficient and uninterrupted traffic flows by offering and managing capacity. Accessibility to inner-cities is mainly facilitated by nearby parkings and artery roads connected to the national highway network. Developments mainly demand driven and solving particular bottlenecks in order to keep the transport system ongoing. , with as a downside, the use of more space, new barriers and inherent spatial fragmentation. Due to the high investments, environmental pressure and norms, social resistance, legal procedures and public opinion, the expansion of the highway network or artery roads in cities isn't evidently any more. Also, the maintenance and renewal of existing and vast transport infrastructures like bridges and viaducts, largely from the second half of the last century, takes an ever growing part of the budget. The budget of the so-called Infrastructure Fund for new developments and maintenance of national highways, waterways and railways was 6 billion euro in 2016, 0,9% of the Dutch GDP (Centraal Planbureau 2016). New developments were only limited to solving traffic difficulties and not for further expansion.

Both central government as well municipalities of large and middle-size cities have focused more and more on the stimulation and facilitation of a modal shift from car to public transport. More use of the train by commuters on a (inter)regional scale and use of the train, tram or metro connected to peri-urban areas on a more local scale when coming by car from the region. Mainly to maintain or to improve accessibility but also to reduce environmental pressure caused by the car.
In the first case, stations are pivotal. The 'rediscovering' of the role of stations has led to an upgrade or transformation of stations not only as a point of transfer but also as place to meet and on an urban scale even as generator for urban renewal or development (Bertolini 1999, Boomen 2012, Acker and Triggianese 2021).
In the second case, transferia or Park & Rides (peri-urban) located near highways reduce the flow of cars to the inner-city, reducing environmental pressure, especially in more densified urban areas. Consequently, the downgrade of artery roads and reduction of parking space are now options to reconsider other use of space.
Also related to modal shift is the promotion of cycling and walking in the context of reducing environmental pressure and stimulating exercise to contribute to health. As a consequence, safe cycling paths and pavements are necessary. Also, the vicinity of functions, programmes, and public transport stops are relevant factors due to both modalities limited radius and speed. From a perceptual notion, public space should be safe and attractive with proper dimensions on a human scale.

For water infrastructures, the flood disaster of 1953 in the south-west of The Netherlands, with nearly 1800 casualties and large economic damage, was a national wake-up call. The combination of a north-west storm surge at high tide and the then condition of (sea)dikes has led to this disaster which initiated the Delta-plan for flood protection of the south-west. A vast system of dams, dikes, and movable flood barriers shortens the coastal line by closing several sea arms and maintaining the navigation of ships for the ports of Rotterdam and Antwerp. Paradoxically, the clean-up, rebuilding of houses, recovery of existing dikes, and the building of new works from 1953 had given impetus to the economic growth of the national economy (CBS 2019).
Another event related to flooding was the extremely high water levels of the main rivers Rhine and Meuse in the south-east of the Netherlands in 1993 and 1995. The thread of flooding of large areas behind the river dikes led to people and live-stock in large numbers being evacuated along a large stretch of both rivers. Again a wake-up call that flooding not only could come from sea but also from the rivers that had led to a spatial plan *Space for the River* decided by the national governance in 2007 with 39 measures (Rijkswaterstaat 2021). The traditional approach to reinforce and

to heighten the dikes should deal with many hundreds of kilometers of dikes including demolishing housing and sacrificing landscape and nature. Also, due to environmental awareness and the notion of spatial quality, another perspective was taken over this traditional approach where deepened forelands must give excessive water more space, parallel channels and at particular polder locations instead of canalising the surplus throughout the whole river stretch up until the discharge at sea or the IJssel Lake. Still, particular sections were reinforced or relocated, but the plan's spatial accommodation was key, which is now fully realised in 2019.

The initial expansion of both transport and water infrastructures has gradually set new conditions by its space-defining character and related environmental impact, social and environmental awareness, large maintenance budgets and need for renewal, high investments for extra interventions reducing environmental impact and by the distribution of powers and interest on multiple governance levels and sectorial authorities. A dominant paradigm of growth and expansion isn't appropriate anymore. At the same time, developments seem to consolidate somehow by its risen complexity where a reconsideration of a new paradigm seems needed to create new prospects for action.

Patterns of change: evolving paradigms and climate change are challenge present dominant paradigms for the built environment and constituent elements

As mentioned before, transport and water infrastructures have an environmental and spatial defining impact and footprint within the natural and the built environment. By facilitating mobility for society and economy, they both connect and fragment space as constituent elements of the environmental and spatial context. For the Netherlands, water infrastructures are also of significant importance for flood protection and water management.
The interdependence and interrelationship of the functional and spatial parameters of the built environment are strong and time-bounded due to its permanent character and its occupation of space which isn't infinitely. In this chapter, a more reflective and system perspective is taken in order to position the present phase in particular transport infrastructures within the broader spatial context of the built environment. Which patterns of change and related paradigm shifts could be identified? Could climate change act as a catalyst for developing new paradigms which could give direction and action for a future built environment?

Connected as well locked-in by infrastructure networks

As a consequence of the ongoing urbanisation, economic growth and interrelated infrastructure development, the spatial layout turned out into a tabula scripta of complex and filled in patterns

and layers of occupation by built areas, networks and (leftover) open spaces (Schaick and Klaasen 2011, CRA 2019). The common characteristic of transport and water infrastructures, expressed by its space-defining vectors between nodes at multiple scales of neighbourhoods, districts, cities, metropolitan areas and regions, limit possibilities and options for spatial planning whereby a tabula rasa condition is from the (far) past. Upon the limitation of the existing spatial layout, environmental and safety norms, accessibility issues, and high investment cost for infrastructures co-defining the solution space for new functions and programs.
In order to make use of existing infrastructures, avoid the further sacrifice of the natural landscape, and avoid mobility growth due to further sprawl, the Dutch national governance has refocused the large housing issue and its realisation on the existing built environment. Not on the basis of a grandmaster plan but by establishing a policy framework, offering guiding principles, instruments and legislation for spatial planning, where other administrative levels should develop a vision, agenda and plan related to their spatial responsibility. This should be operational from 2022 whereby urban functions should be combined, existing spatial qualities should be taken as starting point, and all issues should be solved at the particular scale of the particular developments. The urbanisation strategy of a municipality must address the large demand for housing within the existing city-perimeter saving the surrounding landscape and connected to existing transport infrastructures and around transport hubs (NOVI 2020).
Distributed powers and interests on multiple governance levels and sectorial authorities aren't an easy starting point for policy development and decision-making. Infrastructure development defines space and creates an environmental impact on multiple scales. In some manner, the fragmentation of space by networks is also mirrored in the multi-level administration by the fragmentation of responsibility and accountability as a kind of locked-in for developments and action.

Dominant paradigms challenged by evolving paradigms

For many decades the dominant paradigm for the built environment was urban sprawl offering ground-bound homes with a garden as an idealized vision of family life (Figure 2). Sprawl and extension of the transport network are interrelated whereby capacity was the answer to the growth of cars needed for travel to work. Even with the slowdown of new road infrastructure, intelligent traffic systems are optimising the existing capacity better to manage car growth. Sprawl and the transport network have also led to mono-functional business-parks nearby the highway road system and city's out-skirts, mainly accessible by car and well positioned for logistic functions. Public space in cities, apart from parks, seems to be more an appendage of the road infrastructure in the street

profile, which is also mainly paved. All these paradigms, as models ubiquitous realized and thereby dominantly defining space, are highly interrelated whereby the mobility and the built environment paradigms have the most interrelations and shared elements. A shift of both could also set a paradigm shift for the subordinate elements of the built environment. However, this needs a paradigm shift for the governance & policy paradigm whereby several governance levels and sectorial bodies maintain the dominant paradigms: a crystallisation of polices, legislation, budgets, tasks, and responsibilities. Best practices and policies for other approaches need to be widespread among public institutions and practice to serve as a paradigm that directs action and realisation. As a prerequisite for change, a paradigm shift by involved governmental levels and sectors is unmistakably needed.

Several emergent issues like environmental pressure, especially in cities and the poor accessibility of regions and cities, have led to all kinds of measures where modal shift from car to public transport or bike is an evolving mobility paradigm found in many cities. With better public transport, the need for a car could be lesser for commuting or mainly used at regional level in case transport nodes like stations or Park & Rides facilitates, provide seamless accessibility to inner-cities. In the Netherlands, at all governmental levels, policies are developed and investments have been made with a thematic focus on the accessibility of regions and cities by (re)design of (new) stations and strategic locations for P&R. This indicates that already a paradigm shift is ongoing which could evolve into a new dominant paradigm if its measures, instruments and organizations are institutionalized. As infrastructures, there is also more awareness of embedding those objects better in the urban fabric. This counts partly also for road infrastructures nearby living areas whereby cover-ups, deepening, tunnels or downgrade of urban roads creates

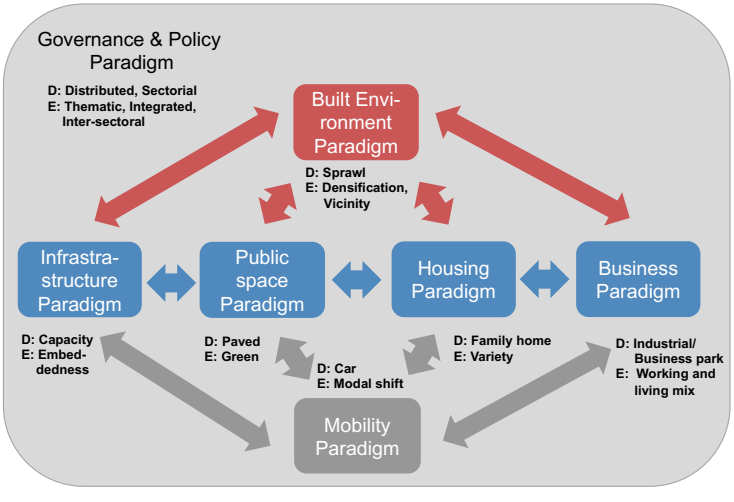

Figure 2 – Dominant and evolving paradigms for the built environment and sub-ordinate elements and mobility.

urban space for other functions or further densification with housing. The latter is a strategy to accommodate the need for housing without expansion of territory. Demographic and economic developments in western countries also show the decline of the size of households and the growth of single households, leading to another need and variety of housing. There is also a tendency to mix start-ups, small maker-business, etc., more and more with housing in urban districts. These several trends also address another approach for public space concerning use and appearance. With more focus on walking and cycling in the spatial context of densification and vicinity, the layout and design of public space will be key for user experience. The effects of climate change like extreme rainfall and heat stress pressure the paved public space where green accommodates several needs.
The interdependency of emerging trends and space requires a more thematic and integrated approach from multiple governmental levels and inter-sectoral collaboration to develop and establish new dominant paradigms that give direction for action and change. In so far, climate change could be a catalyst for the already evolving paradigm shift for mobility, built environment, and subordinate elements will be explored in the next paragraph.

Climate change as catalyst for paradigm shift and system change

Apart from emergent issues and particular measures related to the operation of the (daily) urban system or the flood protection and water management of the built environment, a major driving force is related to climate change and inherent mitigating and adaptive measures addressing cause or impact. The use of fossil energy and related CO_2 emissions has contributed significantly to global warming and inherent climate change. Its impact like sea-level rise, drought, extreme rainfall, and heath-stress endanger nature and mankind (in)directly. Even with the alarming state of affairs, there is a slow and diverted carry-over from the Paris agreement of 2015 aiming at CO_2 neutrality in 2050 to a broad spectrum of policies for the economy, society and environment and its subordinate themes like energy transition, sustainable transport and climate adaptation. However, climate change-related issues and policies could push many systems to another state or reconfigure them regarding their purpose, functionality, activities, services, (infra) structures, conditions, and administrative, policy, and economic framework. Ahead of a widespread system change, interpreted as a transition from the present to another system state, a paradigm shift should firstly set the scene for another way of interpreting, thinking and acting foremost initiated by forerunners and embraced by early adopters. When relating the effects of climate change like extreme rainfall to the built environment, the sewage of the water system and the paved roads and sidewalks of the urban transport system

are directly involved. In case of heat stress, the latter is also involved, but using infiltration opportunities could nourish the water system in providing other functions like water storage and vegetation maintenance for cooling as an ecosystem service. All measures related to the green public space paradigm are connected to some elements of the transport and water system.
When relating the energy transition to the built environment, the energy performance and efficiency of buildings for warming or cooling and the way of transport are directly involved. From the architectural perspective attention, need to be taken to the direction to the sun, the materials and openings of the facade and roof and its overall insulation performance. Eventually, the water system concerning the retention and use of rainwater for the maintenance of vegetation at the roof or façade for cooling could also play a role. It is also related to the green paradigm for the public space. Alternative ways of transport are related to the modal shift as an evolving mobility paradigm. Walking and cycling are energy neutral, public transport is energy efficient per passenger, and the car park's electrification could benefit from renewable energy. When the latter is also combined with car-sharing due to limited possibilities for charging-infrastructure in neighbourhoods, parking space could be reduced or reorganised within the public space, including infiltration of rain water in the soil. Also, walking and cycling have a strong impact on the urban street profile and as such, on the transport system and its use of public space. Walking and cycling are at another scale level also related to the spatial layout and distances between functions and amenities, referring to the planning and development of the built environment.

All before mentioned measures are related to the adaptation or mitigation paradigm of climate change which could involve the water and/or transport system and its use of (public) space within the built environment. TTo make this all happen in the long term, the paradigm of the built environment itself should be involved whereby densification and vicinity are conditional aspects of the evolving mobility paradigm of modal shift. The last one is mainly initiated from congestion and environmental issues and the economic need for accessibility but could be reinforced and taken to another level driven by climate change. As such, climate change could act as a catalyst for some interrelated paradigms, which could steer system change for particular aspects and scales. The interdependency and interrelationship between the effects of climate, the involved systems and measures that redefine the use of space and materials require an integrated and inter-sectoral approach whereby different time-scales should be taken into account due to the speed of change of the built environment, its elements and layers.

Change as temporal phenomenon

As defined before a paradigm shift is related to a different interpretation, way of thinking and acting on issues than traditionally which is institutionalized in design, artefacts, policies, legislation, structures, budgets, tasks and responsibilities. So there is (also) a strong cultural aspect related to a paradigm shift which is a precursor for system change even if it addresses particular components instead of the whole system. This could take generations of planners, designers, engineers and policy advisors who act according to the dominant paradigm related to the driving forces for society and economy and to the prevailing vision and conditions as zeitgeist. The built environment has also its characteristics which have a temporality related to its functions and layers.

As described before, climate change is the main driving force for the forthcoming decennia. The combination of mitigation and adaptation measures and evolving paradigms like modal-shift and urban densification impact the transport and water systems and ultimately have a spatial impact that also involves public space. At (sub)system level, the intersection of the transport and water system with the spatial system is clearly as constituent elements of the built environment (as a static representation of a city) and of the urban system (as a dynamic representation of a city). Especially the networks which connect urban functions, activities and flows have a space defining character (Figure 3).

Change at functional and network level for transport, water management or flood protection could influence the spatial layout due to its causal interrelationship for the need for space. However, the dynamics are mainly related to use and activities and not at a functional or network level which is intrinsically static and layered. The speed of change related to urban functions like living and working and related buildings have a timescale of at least several decades while transport or water infrastructures will have a lasting impact and expressing permanency for many decades and even centuries (Zandbelt 2017, Schaick and Klaasen 2011).

The first steps of change are more trying to optimize the particular system components with soft measures by policies and in a next stage by actual physical interventions, both could set new conditions for further developments. As an example, concerning modal-shift, a municipality could introduce environmental zones and norms for (diesel) cars or introduce high parking tariffs, presuming that commuters of visitors will take other forms of transport to the inner-city whereby (also) high fines should enforce the intended behaviour. Alternatively, the built of parks & rides at strategic locations combined with reduced parking and public transport tariffs also stimulates the intended behaviour but stimulates positive incentives. The benefits related to the necessary investments should come from

less busy traffic, less emissions and noise and less space needed for parking. So new opportunities for the public space could emerge from downgrading car infrastructure to build more near former busy city arteries and give way for pedestrians and cyclists which require more attention for spatial quality due to scale, speed and experience (Boomen, Hinterleitner, and de Boer 2017). Measures and interventions are still within the present transport and spatial system boundaries but they gradually change at the component level and shift the dominant car paradigm to that of a self-moving city-dweller. An autonomous driving car will be still part of the car paradigm and more evolutionary than introducing a fully opposite perspective which could develop as a new paradigm. Such a paradigm shift could stimulate new policies and elicit other interventions in the built environment for urban densification, green or intricate pedestrian and/or cyclist networks at a large urban scale and improving the living environment in general. Public space is key and the main parameter for change, and due to its nature a public merit good related to public opinion, political interests and policy making. Both spatial design by architects or urbanists as well related technical design by engineers are part of a broader discourse nourished from many perspectives and interest and are not autonomous actions in itself. Without a clear dominant paradigm and integrated, multidisciplinary and inter-sectorial approach, it will be a challenge to address a multitude of issues that all claim space, especially in already dense urban areas or in a vulnerable natural environment.

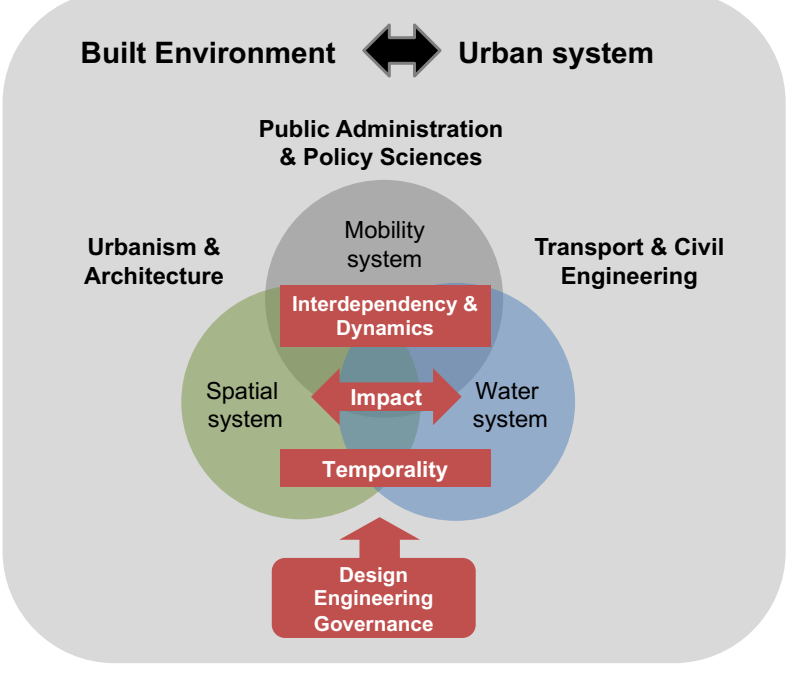

Figure 3 – Intersection of systems within its domain of application

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TRANSITION IN URBAN ANALYTICS, INSIGHT INTO RESEARCH

Špela Verovšek

Introduction

By what means (How) urban design and planning in contemporary shifting conditions are addressed is strongly associated with the ways spatial issues are framed, detected and analysed. Rapid evolution in *Information and communications technologies* has brought the potentials of urban analytics onto the subsequent levels and, consequently, better prospects for well-informed decisions based on the existing data and its direct reuse. However, the question arises whether our capacities allow for becoming the advocates of a transformative change and whether we have sufficient knowledge and methods to foster sustainable urban development by it. A massive amount of data is generated each moment by sensors on millions of devices, machines, and smartphones in our cities nowadays. How data and IT knowledge can be used to generate insights for enhanced decision making and urban planning is a current topic among practitioners, academics and government agencies alike, situating urban analytics as an emerging interdisciplinary arena with strong tendencies toward some crucial shifts.

This chapter provides a brief insight into the recent research[1] conducted by the Faculty of Architecture, University of Ljubljana, dealing with the data-driven support for sustainable and quality urban renewal on the level of neighbourhoods, as well as with the necessary integration of the data into a viable system for the assessment purposes. While following the goals of the two national research projects, we encountered numerous obstacles related to data accessibility, data resolution and data integration accompanied by a critical lack of metrics to address less quantifiable aspects of urban quality, sustainability and wellbeing in neighbourhoods.

Background

Rerecord-keeping and monitoring the progress of neighbourhoods from the various aspects of sustainable development, an as short-term and long-term comparability of successful revitalisations is an emerging need. We are interested in informing the neighbourhood scale for more reasons. There is a growing evidence and recognition that cities shape up through numerous socio-economic and policy-shaping transactions at the district- or neighbourhood- like scales (Waldron and Miller 2013). Scaling up from building-like scale

[1] The research is part of the national projects J5-1798 - 'Data integration framework for the assessments of the sustainable efficiency in Slovene neighbourhoods and settlements', and J5-7295 - 'Urban renewal decision support system balancing energy efficiency and management of local resources in neighbourhoods in Slovenia', supported by the Slovenian Research Agency and implemented by the partnership of the University of Ljubljana and Urban planning Institute of the Republic of Slovenia.

results in complex interactions, thus calling for complex assessment tools that allow more than only a summation of values derived from assessing individual buildings, objects, and infrastructures (Verovšek et al. 2018, Garau and Pavan 2018, Leach et al. 2019). Adopting an aggregated analytical view at the inter-building level and at the same time shifting our concern to resources other than energy brings the scale of a neighbourhood, public spaces, and neighbourhood communities firmly into focus. A neighbourhood scale can impose a significant influence on the issues such as traffic flows and mobility patterns (Nikulina et al. 2019), waste and water management, green areas management, liveable design of the streetscape and public space, awareness and consumers' behaviour, mitigating negative environmental impacts or similar (Batty 2012) providing a manageable and at the same time diverse unit with the ability to contribute the lion's share to attaining sustainability objectives and the quality living objectives.

The question of the quality and sustainability optimization of the existing neighbourhoods proved to be relevant particularly in combination with the data-driven decision-making (Anejionu et al. 2019) and related methodologies.

Issues

The diversity, availability and consistency of data sources for specific relevant domains and within certain spatial scales such as district, neighbourhood, public space, streetscape, are often inconsistent and fluctuating. On the one hand, we are facing an increasing amount of captured and gathered data that reflect a specific urban system's performance as well as demonstrate related characteristics and processes. On the other hand, we are faced with significant data scarcity, especially within the small-scale, micro-urban, and fine-grained records. We define and track the parameters such as place walkability or connectivity, street enclosure, transparency on a human scale, light pollution, reliability of public transport, etc. One of the critical remarks made by other authors (e.g., Lützkendof and Balouktsi 2017, Lin and Geertman 2019) is that assessment models do not offer evaluation of less tangible aspects of sustainability and quality, such as the experiential perception of place, users' dynamics and their activities are taken in a place, place tidiness, its visibility, the diversity in space or its identity, etc.

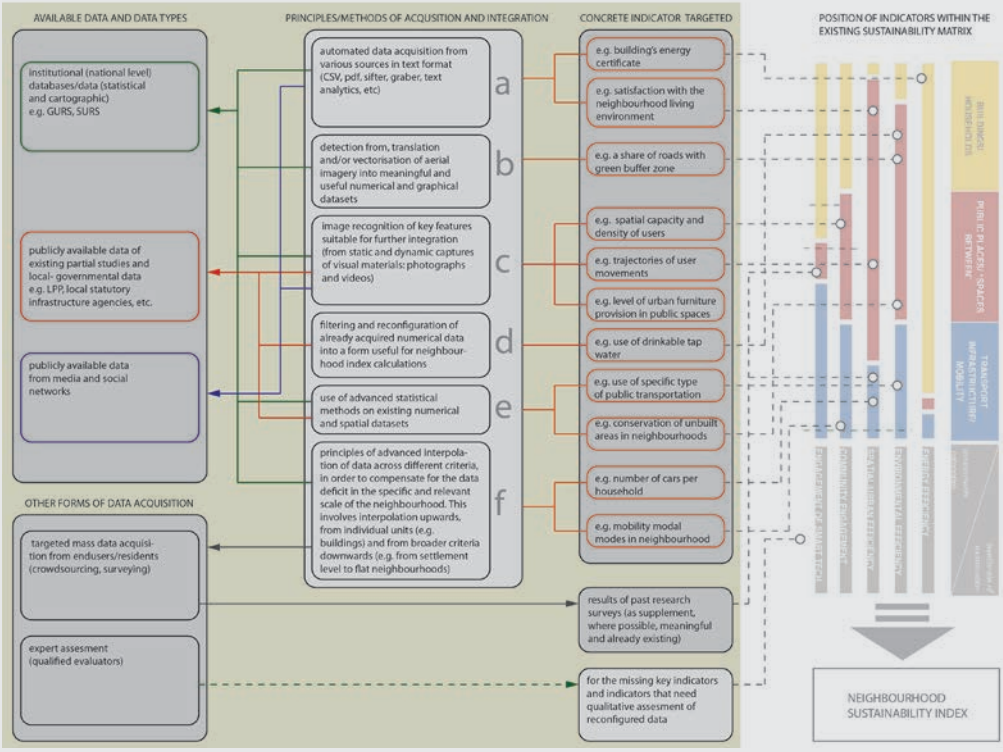
These variables are less defined and highly structured and thus difficult to measure; however, they significantly impact user experience and one's perception of a quality living environment. The latter's perception is often largely due to either sustainable/ prudent or weak design decisions.

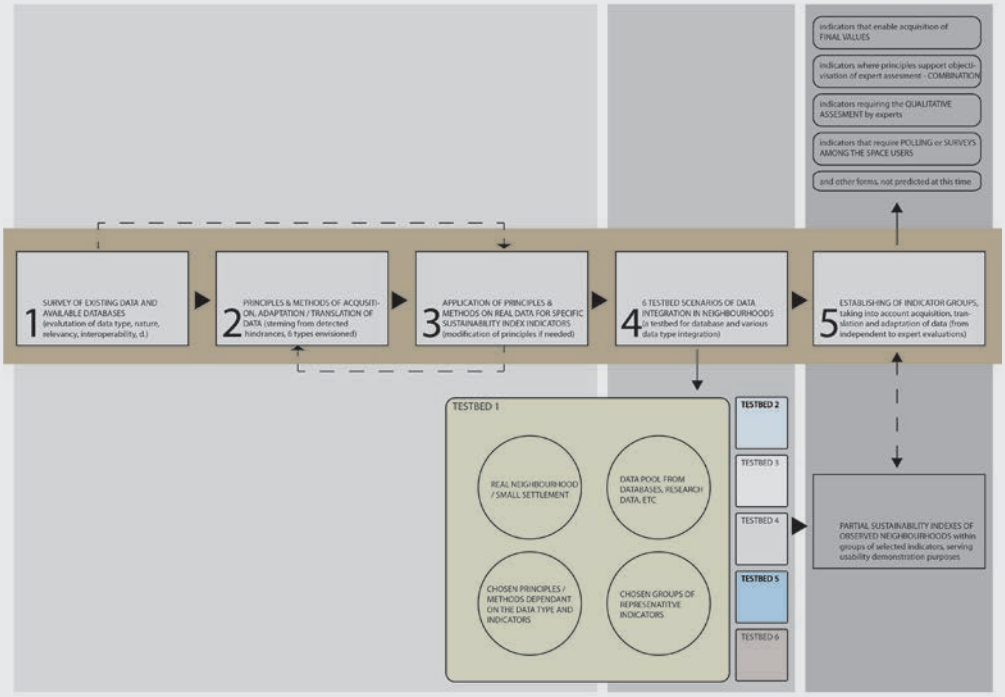
Furthermore, national and municipality-related institutions create and operate datasets based on specific purposes which are designed for problems at hand; resulting in discrete and incompatible databases, disconnected time series, reciprocally incompatible data

queries characterized by diverse data models, and storage structures (Sharifi and Murayama 2015; Koenig et al. 2019). Integration and processing of data queries (for the purpose of sustainability and quality assessments) are currently often performed in a manual fashion, hence requiring great amounts of time and effort, while also increasing the risk of errors in the aggregation process.
The existing literature gives us relatively scarce answers to these issues, although this seems crucial for the overall operability of the assessment instruments and actual implementations. In analysed assessments tools and their operability (e.g., Bird 2015, Sharifi and Murayama 2015, Zheng 2017, Boyle et al. 2018), the lack of data for the quantitative evaluation was most commonly fixed by performing qualitative assessments on the basis of a trained expert estimation. Another solution often used is simple interpolations where a wider area (or time lap) was used as a proxy for performance against an indicator or more indicators. Both can critically decrease the geospatial resolution and eloquence of data, resulting in a weak informative strength of the assessment.

Objectives and Approach

According to the identified problems, our current efforts' main objectives promote new methods that support, extend, and upgrade the existing monitoring and assessment protocols. This further allows for a more integrated, further automated, more modular structure of the data and parameters to support assessing neighbourhoods' sustainability and quality rate, with a strong affinity towards data reuse for rationalisation of the evaluation process.
To bridge the mentioned gap and advance our research potentials, we established a series of empirical pilots to implement and demonstrate particular mechanisms and methodologies of data integration. Due to the wide scope of the research framework and the accompanying broad range of potentially suitable datasets and data types, the work programme was designed as a series of scenario testbeds in (initially) separate theoretical and applied assemblies. The proposed workflow allows us to study selected data assemblies and actual IT-supported solutions in detail.
Such scheme represents the course and focus of the work on the systematic elimination of interference barriers and different types of data, which at the same time lead to the acquisition of the final assessments of neighbourhoods through various testbed scenarios. We interconnect the actual data sets with relevant indicators targeted through principles of advanced acquisition and integration techniques (Figure 1). Cases of such principles include automated data acquisition from various sources in text format; detection from, translation and/or vectorisation of aerial imagery into meaningful numerical and graphical datasets; image recognition of key features suitable for further integration (from static and dynamic captures of visual materials: photographs and


AVAILABLE DATA AND DATA TYPES
PRINCIPLES/METHODS OF ACQUISITION AND INTEGRATION
CONCRETE INDICATOR TARGETED
POSITION OF INDICATORS WITHIN THE EXISTING SUSTAINABILITY MATRIX
institutional (national level) databases/data (statistical and cartographic) e.g. GURS, SURS
publicly available data of existing partial studies and local- governmental data e.g. LPP, local statutory infrastructure agencies, etc.
publicly available data from media and social networks
automated data acquisition from various sources in text format (CSV, pdf, sifter, graber, text analytics, etc)
a
detection from, translation and/or vectorisation of aerial imagery into meaningful and useful numerical and graphical datasets
b
image recognition of key features suitable for further integration (from static and dynamic captures of visual materials: photographs and videos)
c
filtering and reconfiguration of already acquired numerical data into a form useful for neighbour-hood index calculations
d
use of advanced statistical methods on existing numerical and spatial datasets
e
principles of advanced interpola-tion of data across different criteria, in order to compensate for the data deficit in the specific and relevant scale of the neighbourhood. This involves interpolation upwards, from individual units (e.g. buildings) and from broader criteria downwards (e.g. from settlement level to flat neighbourhoods)
f
e.g. building's energy certificate
e.g. satisfaction with the neighbourhood living environment
e.g. a share of roads with green buffer zone
e.g. spatial capacity and density of users
e.g. trajectories of user movements
e.g. level of urban furniture provision in public spaces
e.g. use of drinkable tap water
e.g. use of specific type of public transportation
e.g. conservation of unbuilt areas in neighbourhoods
e.g. number of cars per household
e.g. mobility modal modes in neighbourhood
OTHER FORMS OF DATA ACQUISITION
targeted mass data acquisi-tion from endusers/residents (crowdsourcing, surveying)
expert assesment (qualified evaluators)
results of past research surveys (as supplement, where possible, meaningful and already existing)
for the missing key indicators and indicators that need qualitative assesment of reconfigured data
NEIGHBOURHOOD SUSTAINABILITY INDEX


indicators that enable acquisition of FINAL VALUES
indicators where principles support objecti-visation of expert assesment - COMBINATION
indicators requiring the QUALITATIVE ASSESMENT by experts
indicators that require POLLING or SURVEYS AMONG THE SPACE USERS
and other forms, not predicted at this time
1 SURVEY OF EXISTING DATA AND AVAILABLE DATABASES (evalutation of data type, nature, relevancy, interoperability, d.)
2 PRINCIPLES & METHODS OF ACQUISITI-ON, ADAPTATION / TRANSLATION OF DATA (stemming from detected hindrances, 6 types envisioned)
3 APPLICATION OF PRINCIPLES & METHODS ON REAL DATA FOR SPECIFIC SUSTAINABILITY INDEX INDICATORS (modification of principles if needed)
4 6 TESTBED SCENARIOS OF DATA INTEGRATION IN NEIGHBOURHOODS (a testbed for database and various data type integration)
5 ESTABLISHING OF INDICATOR GROUPS, taking into account acquisition, tran-slation and adaptation of data (from independent to expert evaluations)
TESTBED 1
REAL NEIGHBOURHOOD / SMALL SETTLEMENT
DATA POOL FROM DATABASES, RESEARCH DATA, ETC
CHOSEN PRINCIPLES / METHODS DEPENDANT ON THE DATA TYPE AND INDICATORS
CHOSEN GROUPS OF REPRESENATITVE INDICATORS
TESTBED 2
TESTBED 3
TESTBED 4
TESTBED 5
TESTBED 6
PARTIAL SUSTAINABILITY INDEXES OF OBSERVED NEIGHBOURHOODS within groups of selected indicators, serving usability demonstration purposes

videos); filtering and reconfiguration of already acquired numerical data into a form useful for neighbourhood index calculations; use of advanced statistical methods on existing numerical and spatial datasets; principles of advanced interpolation of data across different criteria, in order to compensate for the data deficit in the specific and relevant scale of the neighbourhood, this involves interpolation upwards, from individual units (e.g. buildings) and from broader criteria downwards (e.g. from settlement level to flat neighbourhoods).

Each testbed scenario consists of four key components: i) specific location - a meaningfully complete functional unit in the form of a smaller Slovenian settlement or neighbourhood; ii) stock of different types of data sources and databases with various scales and ranges, complemented by our own data obtained from prior research; iii) selected assemblies (modules) of representative sustainable indicators; iv) application of selected principles and methods according to specific existing indicators/measures of sustainability or quality (Figure 2).

Figure 1 – Interconnection of the current research approach with the pre-set matrix of sustainability and quality metrics. (Graphic Juvančič, 2019)

Anticipated Results and Conclusions

The research efforts described in this chapter are following our continuous determinations for informing the urban design and renewal, and effectively shifting to transformed circumstances that we are facing as regards the urban data and analytics. The research promotes the potential for highlighting the frame of manoeuvrable room in urban renewal and design through data-driven support. It gives consideration both to users' demands/needs and to sensitivity and responsiveness of the mere spatial reality, which influences the users' behaviour and reveals the spatial thresholds in terms of social, economic, and environmental constraints of the neighbourhoods. Ensuring pragmatic efficiency in terms of sustainability that goes beyond the scale of single buildings, the integrated data enable benchmarking, comparison between neighbourhoods and strategic decisions on priorities in the renewal and renovation process of such socio-physical settings.

The anticipated outcomes will foster measurable, replicable and resource-efficient solutions by documenting observed progress through indicators and integrated data collections, formats and sharing. They follow the strategies of data reuse, which being one of the most perennial topics in the current state of data overloads. Prudent reuse of the existent datasets supports tendencies towards rationalization of the evaluation and monitoring process, and as such ccontributes well to enter into the new era of urban analytics effectively.

We believe that fine-grained urban sensing coupled with well-established remote sensing mechanisms and official data records greatly enhances our potentials in terms of increased geographical resolution of captured data, denser timescale, and finer eloquence.

Figure 2 – Research phases following the dynamics of the testbed scenarios. (Graphic Juvančič, 2019)

Consequently, the envisioned methods cope with the most critical issues in this domain and make it easier and more cost-effective to identify segments of high and low sustainability performances, and thus, guide urban diagnostics, responsive policies, and prioritise investments in the contemporary situations and shifting conditions.

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Viewpoints

SPECIFIC/GENERIC, DISCIPLINARY/ INTERDISCIPLINARY. TWO REMARKS ON ARCHITECTURAL AND URBAN DESIGN'S PERSPECTIVES FOR SHIFTING CONDITIONS —

Elena Fontanella

This short essay deals with the role assumed by architectural and urban design in a time such as the present one, marked by uncertain conditions and rapid changes that closely affect the design disciplines.
Referring to recent research experiences and symposiums[1] that deal with this topic, I will focus on two observations regarding the role of architectural and urban design, involving two couples of keywords assumed in a dialectical relation: specific/generic, disciplinary/ interdisciplinary.

The first remark refers to the present time condition as marked by a continuous transition and by ever-shifting conditions: a time that appears in unceasing evolution, liquid (Bauman 2011). These conditions are often blurred. Simultaneously, they are rapidly changing, and they often present problems affecting multiple dimensions: both material and immaterial, in a mutual relationship. Among those, the spatial dimension is just one of the variables, and it is crucial to understand its interaction with the other dimensions involved. A typical shared feature seems to be a deep uncertainty (Gregotti 2012), exponentially worsened by the ongoing pandemic. Nevertheless, these changing conditions impact the territories in a very different way.

Therefore, my first observation addresses this apparent contradiction: the fluctuation between a condition of uncertainty and strong mutability shared to the point of acquiring a character of universality, and the infinite specificities linked to places and territories. Within this dialectic between *specific* and *generic*, the ability to recognise each context's characteristics assumes a crucial relevance, capable of leading us towards the individual cases, helping to overcome the generic nature and facing complexity. Tackling the need for careful work on methodologies, tools, actions and design strategies, the construction of descriptive and interpretative readings of the different contexts represents a skill of great importance within the design process. Far from being a purely analytical operation before the design process, the construction of descriptive and interpretative studies, on the contrary, belongs to the project itself: the way we observe places is far from being neutral. These allow us to root the design process within each site's specificity, identifying the fragilities to be contrasted and the resources to be enhanced. The ability to produce these readings (such as maps at different scales), especially in Italy, is far from being a new skill. On the contrary, it can be referred to the design tradition's dimension (Muratori 1960; Gregotti 1966; Aymonino 1975; Crotti 1998). (Figure 1)

Facing a common transition, rapid changes and out-of-focus situations, we can deal with complexity in two

ways: either recognising some recurring elements and characteristics shared by places geographically distant from each other, or bringing out the specific features that each area incorporates. This ability can play a central role in redefining methodologies, actions and intervention strategies of the architectural and urban design.
Within the rapid flow of time and the changing conditions that characterise contemporaneity, space still retains its inertia, incorporating traces and materials capable of conveying knowledge. The careful understanding of contemporary territories at different scales as real *palimpsests* (Corboz 1998) – in which time has stratified materials and information – can be enriched thanks to the use of statistical data and indicators. They could help in connecting the spatial dimension with the social, economic, demographic, environmental and cultural ones: this puts us in a dynamic relationship and dialogue with other disciplines.
By combining physical spaces and intangible data and information, it is possible to contribute to the construction of new forms of knowledge of reality. It becomes fundamental in this sense to understand how, thanks to which operations, and to what extent it is possible to use data and indicators as design-oriented tools.

Hence the second remark: with the growing complexity and the presence of multidimensional problems, the need to work in an interdisciplinary way arises. At the same time, it has to be understood and clarified what it means to act in an integrated manner. In a perspective oriented towards design transformation, how should we work, at different scales, interacting with other disciplines?
The issue of interdisciplinarity arises, together with the need to better define this interaction's meaning and to clarify any solutions in order to make it possible. My second observation refers to this subject, attempting to contribute without pretending to offer a univocal answer to a question of such importance.

To do this less abstractly, I will refer to the research I am carrying out within the *Territorial Fragility*[2] project, promoted since 2018 by the Department of Architecture and Urban Studies (DAStU) of Politecnico di Milano, by briefly recalling it. Sixteen lines of research were started within the project. Each line focuses on different territories and themes involved to deepen the knowledge of fragile territories in Italy in an action-oriented perspective. The variety of territories that the project is dealing with and of the topics involved is counterpointed by the heterogeneity of the skills (and backgrounds) of the post-doc researchers involved and of the professors of the committees guiding each line of research: architects, urban planners, policymakers, landscape architects, engineers, geographers, economists, sociologists, philosophers.
The project itself tests the need to build synergies between different skills, crossing and overcoming disciplinary boundaries. As a result of the diverse education and complementary skills, we have the opportunity to face common problems by crossing the respective research perspectives and by relating the different points of view. On the one hand, the interaction between the various disciplines represents a moment of mutual enrichment. On the other, it is incredibly challenging, and some difficulties have been reported. It involves the need to define a shared lexicon: often, within

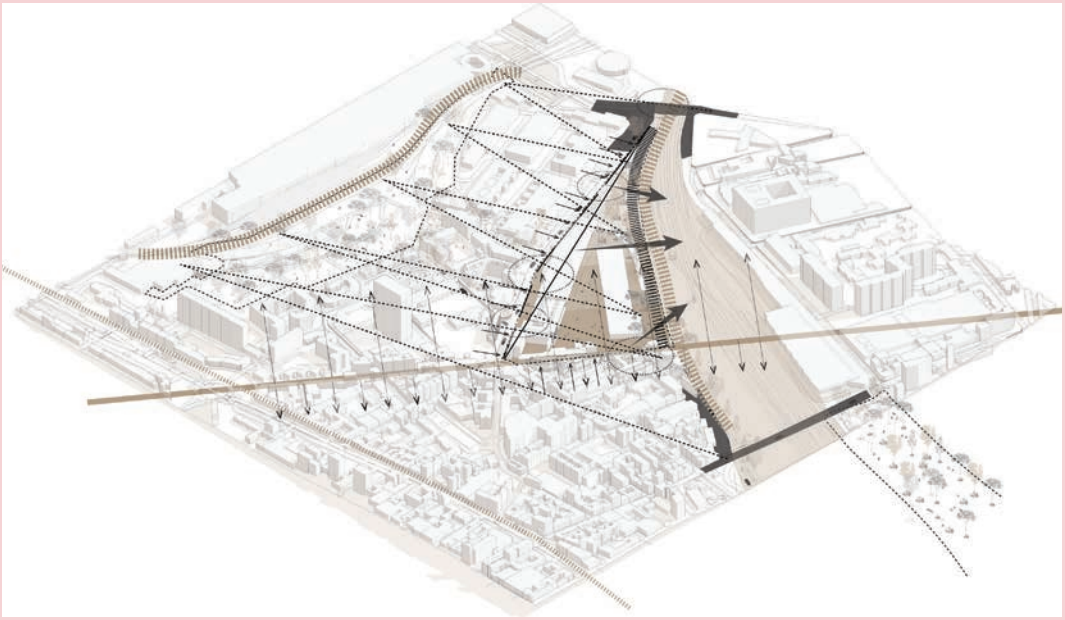

Figure 1 – Toward the design strategy. An interpretative reading of the Hebert railway yard, in Paris, within its context. It combines the strategical actions promoted by the project at the urban scale: connecting the urban fabric; promoting neighbourhood centralities; giving back continuity to the green areas; enhancing local sustainable mobility; braking up the enclosure; relating to the railway. The drawing is part of the Master Thesis 'Paris Hebert. An abandoned rail area turned into a new centrality for the 18th district' in Architecture, Built Environment, Interiors (Politecnico di Milano, School of Architecture Urban Planning Construction Engineering) by C. Parnisari, C. Pellegrini, N. Perina (July 2021). Supervisor: M. Bovati, Co-supervisor: E. Fontanella.

Figure 2 – 'Tor Bella Assai!': a design proposal for the regeneration of the peripheral mass housing district of Tor Bella Monaca in Rome. The project, that combines knowledges and design scales, is based on six fields of strategic action: the courtyards toward the countryside; a new system of entrances; the rearticulation of the ground floor through home-work typologies; safe, living and accessible urban spaces; microclimate control and resilience; envelope and energy efficiency. 'Tor Bella Assai!' is a project by: P. Carli, A. Delera, N. De Togni, L. Dondi, E. Fontanella, A. Kërçuku, F. Lepratto, M. Morganti, A. Rogora (Politecnico di Milano, DAStU), L. Mastrolonardo, M. Romano, L. Conte (Università degli Studi "G. d'Annunzio" Chieti-Pescara) with C. Battini, R. Bondioni (2020).

different disciplines, the same terms are associated with close meanings but not always coincident. Simultaneously, it requires listening skills, catching contributions from other points of view as opportunities to enrich our own. Therefore, it is about starting with our skills and being able to strive towards an integrated approach that can take advantage of the construction of interdisciplinary connections. With this goal in mind, some of us recently carried out a research-by-design activity[3] related to the regeneration of the peripheral mass housing district of Tor Bella Monaca in Rome, as part of a wider design group[4], in which our different skills could enrich each other. The experience's objective was to formulate a project proposal capable of having an impact on the problems that characterise the neighbourhood, intersecting the different dimensions involved (from the spatial to the socio-economical ones). The design proposal defined connections among disciplines and design scales, orienting the transformative action particularly on the places where the fragilities of the public housing neighbourhood are mostly concentrated: the ground floor, the open public spaces and the interface among them.

From this perspective, the two raised observations identify two possible elements for anchoring a design research that questions itself on methodologies, strategies and actions which the architectural and urban design can assume while facing contemporary time's shifting conditions. (Figure 2)

Notes

[1] Among those, I refer to the international seminar *Design Actions in Urban Transitions. Architectural and Urban Design for Shifting Conditions* that took place on 30th October 2019 at the School of Architecture Urban Planning Construction Engineering of Politecnico di Milano. The seminar was edited by Ilaria Valente, Marco Bovati, Emilia Corradi, Fabrizia Berlingieri, Cassandra Cozza.

[2] The Department of Architecture and Urban Studies of Politecnico di Milano (DAStU) has been selected and funded by the Ministry of University and Research as Department of Excellence. For the five-year period 2018-2022 it promoted the *Territorial Fragility* project, with the aim of building knowledge and design hypotheses for fragile territories in Italy. As part of the project, 16 research lines were launched, each of which carried out by a research fellow and a committee of professors. The research line that I run with within the Territorial Fragility project is: *PeriFrag - Urban and metropolitan peripheries as fragile territories*. For further information on the project, see the website http://www.eccellenza.dastu.polimi.it/

[3] The research-by-design activity was developed taking part to ReLive 2020 'Architecture and technology for dwelling. Upcycling public housing buildings of Tor Bella Monaca in Rome': a competition promoted by SITdA - Società Italiana di Tecnologia dell'Architettura (Italian Society of Architectural Technology).

[4] Our design team ("reBel-la"): Paolo Carli, Anna Delera, Nicole De Togni, Lavinia Dondi, Elena Fontanella, Agim Kërçuku, Fabio Lepratto, Michele Morganti, Alessandro Rogora (Politecnico di Milano, DAStU), Luciana Mastrolonardo, Manuela Romano, Ludovico Conte (Università degli Studi "G. d'Annunzio" Chieti-Pescara) con Chiara Battini, Riccardo Bondioni. https://www.eccellenza.dastu.polimi.it/2020/07/10/concorso-re-live-2020-vince-il-gruppo-rebel-la-politecnico-di-milano-dastu-e-universita-degli-studi-g-dannunzio-chieti-pescara/

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DEMOGRAPHIC FRAGILITY —

Agim Kërçuku

Demographic phenomena are changing the spatial structure, production and consumption methods, and image of the territories. The result is a social topography (Piketty 2014) that is fragmented and conflicted, which imposes new forms of economy and shapes society's new structures, affected by the same dynamics, the state of living changes according to a population that increases or decreases. Territories in transition will have to face opposing fragilities, imaginations, and anxieties. Above all, these weaknesses are visible in regions affected by depopulation and overpopulation and climate, ecological, and health changes.

DEMOGRAPHIC DISORDER

The demographic question understood as the rapid growth of the world's population as a bearer of global disparities seems outdated. According to United Nations data[1], towards the end of the 21st century, there will be a stabilisation of the world's population increase: the curve representing that in the world, raised during the nineteenth century and soaring in the twentieth century, is slowly reversing its course. If in the 70s the rate of increase reached 2% per year[2], today the same rate is settling at around 1%. Globally, around the year 2100 and with a population of 11.2 billion, it will be possible to achieve demographic stability: a population that does not grow and does not decrease, a convergence of demographic behaviour globally and disappearance of relevant migratory phenomena.
However, it is difficult to evaluate the reliability of studies that push forecasts far ahead in time due to the complex dynamics that affect global demographic phenomena. It would be more prudent and more reliable to stop looking at 2050 to provide forecasts and more significant security projections (Bricker and Ibbitson 2019). Demographic trends will influence our behaviours and will increasingly impact different phenomena such as environment, adaptability, sustainability, geopolitics, inequalities, mobility and migration (Livi Bacci 2017). In 2020, the world's population was 7.3 billion. In 2050, it is expected to reach 9.3 billion. Around 2.4 billion more inhabitants will populate the planet, who will need to move, live and be supported. However, the data are too aggregated. The population increase has a differentiated geographical gradient. It will be produced in many ways and in the different geographical areas of the planet, 98% of the population increase will be observed in developing countries, leading to a doubling of impoverished countries. Among some developing countries, the decrease in people will occur in rural areas in favour of an increase in urban areas - mainly coastal, fragile and densely populated areas - compared to the more internal ones. Growth will not affect some other countries (in which the increasing incidence of the elderly population

compared to the total population) will lead to a rapid decrease in the young and fertile age population, the decline generated by the lack of generational change countries.

GEOGRAPHICAL DISTRIBUTION

We live in a world at the height of the demographic disorder, where very different dynamics influence different age groups: some are considered stable or in decline, others continue to take on greater importance and cause profound changes in the geographical distribution of the planet's population. About a billion and a half of the world's population reproduces at a very high rate: among these are the inhabitants of sub-Saharan Africa, some Asian Latin American countries, and about 300 million individuals who inhabit some of the northern areas of India. In another part of the world live more than 2 billion individuals, whose reproducibility is on the contrary very low, so much so that in some cases, they reach the average value of one child per woman, which is below the replacement level. A downward trend will continue to spread in the coming years, not only in Europe and Japan but also in a growing number of other countries, including China[3]. Although the one child policy doesn't exist anymore, the phenomenon of low birth rates is firmly rooted in the population's behaviour.
The demographic decline in some regions of the world will stop only because of a slight recovery in birth rates, primarily due to the migratory flows that will affect some of these regions. The escape from poverty and precarious conditions of existence often caused by war are at the origin of complex mobility in contemporary society. Some countries produce strong demographic exoduses that others necessarily absorb: the net flow of migrants was 20 million between 2005 and 2010, 3.3 million per year[4]. It seems that migration, so vehemently opposed by some governments, is the unwanted solution to low birth rates and population reduction.
The geo-demography of the 21st century will be revolutionised by many trends already in place today. We will witness significant strength changes, with cycles becoming increasingly relevant in some geographical areas while decreasing in others. The United States, whose population in 1950 was one and a half times higher than that of Russia (with current borders), will have tripled the Russian population by 2050. China, today the most populated country on earth, will be overtaken by India. Europe, which at the beginning of the twentieth century contained 25% of the world's population, will halve its demographic weight by 2050 and have only 6% of the world's population by 2100.

DEPOPULATION AND OVERPOPULATION

Ours will increasingly be a planet divided between overcrowding and depopulation. We will reach many limits during the 21st century. More than half of the globe is now anthropised, directly or indirectly, between urbanised areas, infrastructures, cultivated rural areas, woods and pastures over 54% of the 134 million square kilometres of the earth's surface. Longevity will continue to register at high levels. Limits and physical barriers interposed to international migratory flows. Even the weight of the human body is hitting extreme thresholds. On the one hand, we find today almost a million undernourished people globally, and on the other, we are witnessing an increasing number of obese populations.

Figure 1 – Life expectancy at birth, females, estimates. (graphic: A. Kërçuku)

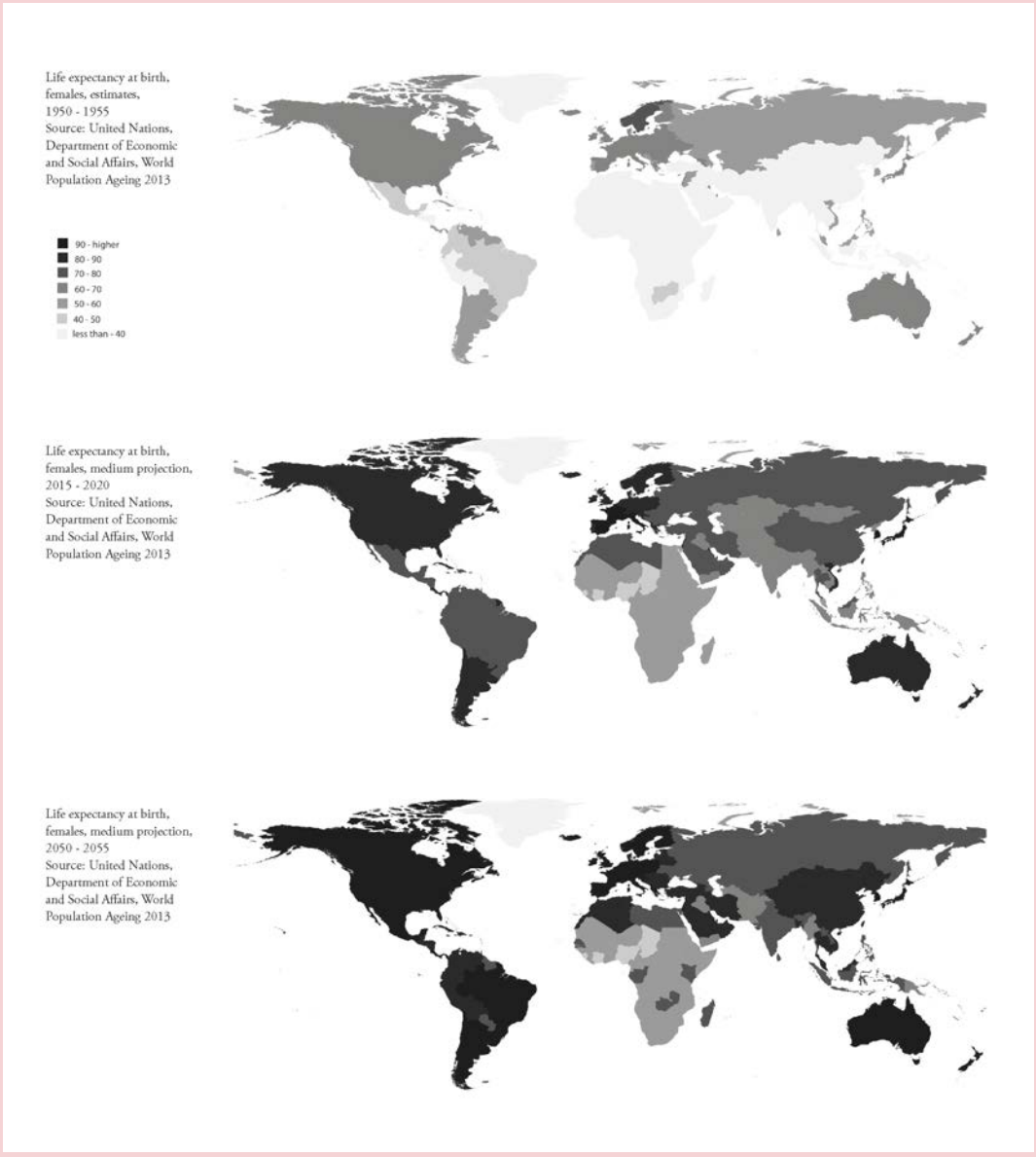
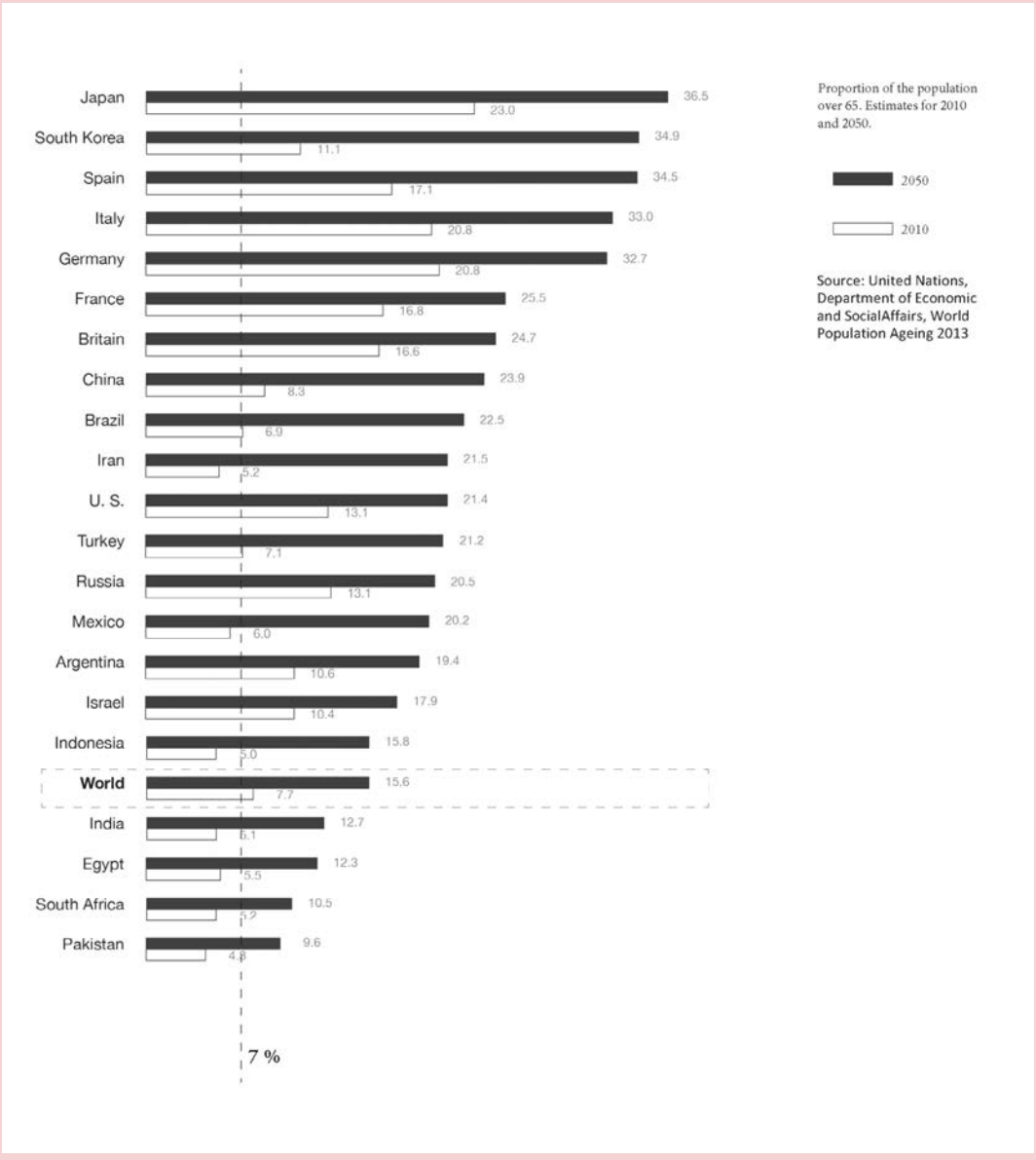


Figure 2 – Population over 65. Estimates for 2010 and 2050. (graphic: A. Kërçuku)



A thousand times faster to travel, a hundred times more in need of energy, in a world where space, the ability to move and energy availability are distributed unequally (Livi Bacci 2017). The rise in sea-levels and the increase in erosion and flooding will force us to take radical measures. Millions of inhabitants could move by the end of the century (Goodell 2017). We must consider the retreat of the human footprint and the rethinking of considerable physical and social equipment.

Demographic phenomena, including the increasing life expectancy, low birth rates and migrations, change the spatial structure, the way of functioning and the territory's images. It is possible to speculate on the implications of populations that are not so obvious, even at the macro level, between shrinking and growing. In Europe and the rest of the world, this creates new geography of population, which draws a double movement: the one of progressive greater density of people in some territories and the alleviation of regions where only older people remain. There are segments of areas that have been hit by a vital population flow, turning into crowded places (Brenner 2014). These are mainly in the context of developing countries, which will face a substantial population level in the coming years.

On the contrary, parts of cities and territories are becoming depopulated. This concerns internal areas and valleys, rural productive regions, widespread urbanisations and industrial districts in crisis, those consumed by mass tourism, fragile urban suburbs, and even entire cities.

The complexity raised by depopulation and overpopulation has spatial implications. Demographic dynamics have a strong social, economic value that invests in urban planning. In that case, it remains unclear how the territory's transitions will take place. Who will be the actors who will encourage the cumulative selection processes (Secchi 2000)? What will be the techniques and outcomes that follow this transformation? What will be the new value of the things around us? What effect will architectural and urban design in shifting conditions measured with the overlap and alignment between new demographic situations, a progressive lack of resources and an increase in climate change have? Therefore, it is necessary to abandon study criteria that reflect homogeneous categories of space, practice and pre-packaged solutions, to better understand the liquidity of the transformations and changes that the different behaviours and desires of the future populations will impress on the project of urban space.

Notes

[1] UN, World Population Prospects. The 2019 Revision (esa.un.org/unpd/wpp).

[2] With the rate of increase in the world population of 2%, this means that it would double in just 35 years.

[3] 1.39 in Italy in 2013 and 1.58 in Europe.

[4] United Nation, World Population Prospect. The 2012 Revision, New York, 2013.

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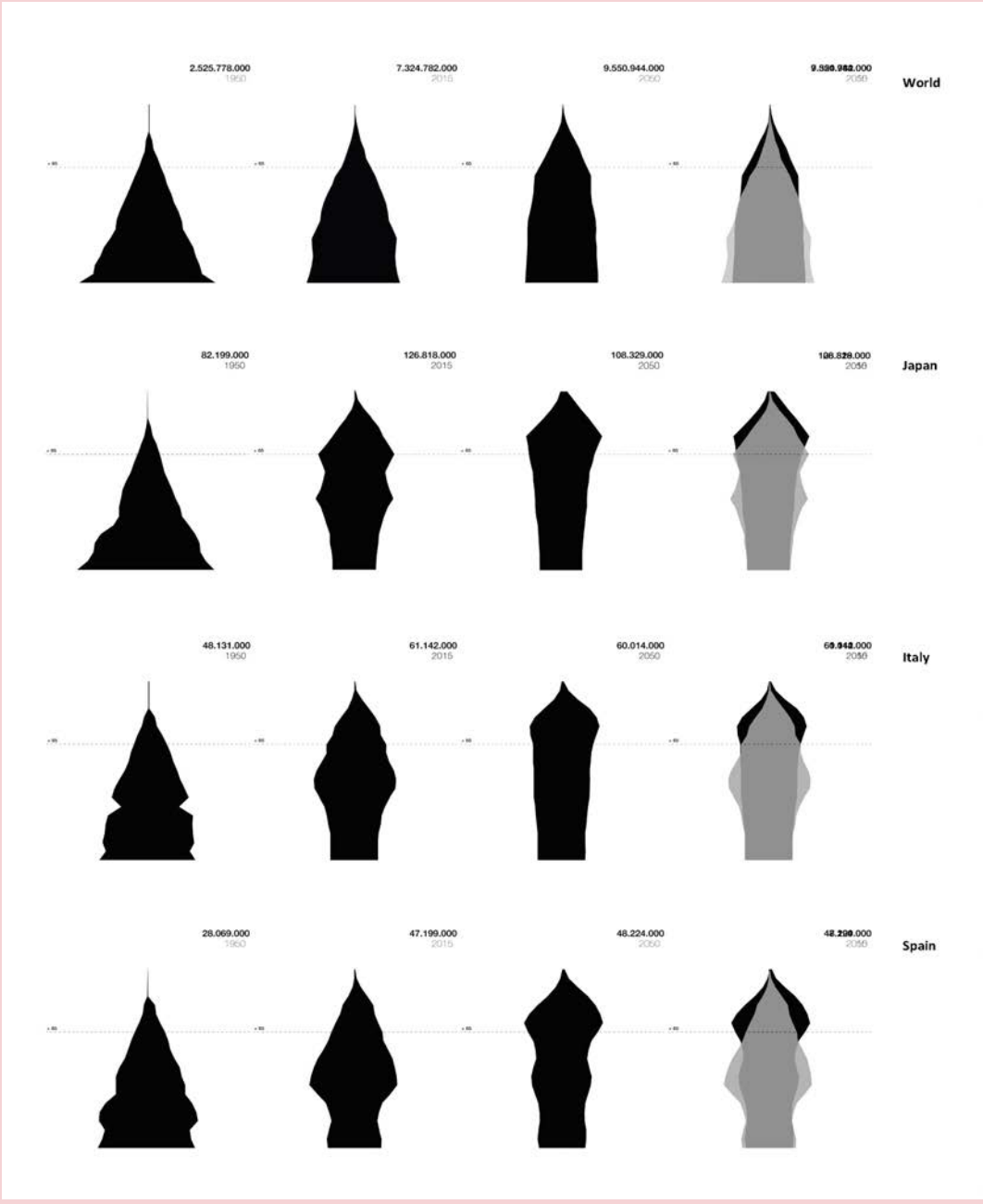
Figure 3 – Population pyramid. (graphic: A. Kërçuku)



ADAPTATION AND RESILIENCE. ARCHITECTURAL DESIGN TOOLS BETWEEN UNCERTAINTY AND TRANSITORY —

Giulia Setti

***Uncertainty* and *transitory* represent relevant conditions in contemporary phenomena. With increasing intensity, we are witnessing sudden changes linked to extreme climatic events, environmental and economic crises that strongly modify the consolidated certainties of design actions. Current scenarios are instable and, therefore, by the need to reflect on the relationship between architecture, environment and economic systems, opening an urgent debate in our disciplines[1]. Unpredictable phenomena linked to climate change effects are affecting different European contexts, raising the necessity to investigate visions about a (possible) future for our cities, observing their peculiar characteristics: infrastructures, public spaces, residual and marginal areas (Guidoboni et. al 2015, Guidoboni and Valensise 2013). In the explorations of the European contexts, from Athens to Rotterdam and Ljubljana[2], there is an idea to build a *common ground* linked to sustainable and energy-efficient design experiments, which envision new scenarios to integrate design approach within natural and artificial landscape.**

It is a radical and continuous change, both in building and designing cities and architectural choices: urban contexts are changing very quickly, and they require the adequacy of design tools.

This essay proposes a dual reflection: on the one hand, it investigates conditions that characterise the current scenario; on the other, it tries to build and outline possible design solutions. *Uncertainty* and *transitory* represent detectable conditions resulting from increasing instability; instead, adaptation and resilience represent desirable design actions.

In this precarious and changing scenario, *adaptation* and *resilience* are possible and useful design actions for transition contexts; it is a matter of imagining projects and scenarios that work with fragments and minimal interventions according to different times and phases (Gunderson et. al. 2009, Ferlenga et. al. 2018). To adapt to new conditions, sudden events or shocks represents a transformative design attitude, capable of modifying any previous conditions. To adapt means to innovate through a change of state and establish, where possible, a new balance and new design solutions.

To face the current conditions of transition and uncertainty typical of contemporary contexts, it is necessary to reflect on resilient and adaptive forms and processes capable of promoting the ability to recover and consolidate architectures, cities and territories.

Therefore, new possibilities of design research are opening up: we live in an era, the one of the *Anthropocene*, marked by sudden climatic and environmental changes (Bonneuil and Fressoz 2016, Morton 2009). Calamitous events, often unexpected, are modifying the delicate balance between architecture and the environment.

An interesting debate has been opened by a recent photographic exhibition held at MAST in Bologna (Italy) entitled 'Anthropocene', with images by Edward Burtynsky, Jennifer Baichwal, and Nicholas de Pencier[3]. The radical changes that human intervention has generated in urban and natural environments were carefully documented and described in the photographic journey. An unprecedented transformation that, inexorably, has changed the territory and resources of the planet: transitional situations could only increase and this, therefore, requires a reflection on the role of architectural design downstream of these changes (Hackett et. al. 2018). Extreme phenomena continue to increase and highlight the lack of projects, processes and policies capable of mitigating their dramatic effects (Birrozzi and Ciorra 2018). The ability of a territory, an architecture or a landscape to adapt to new events or new conditions creates a space open to design actions, to the definition of strategies that could increase the resilience of a place and, therefore, could guarantee greater care for the safety of architectures, territories and citizens (Corradi and Gritti 2018). Adaptation requires, therefore, a radical design vision focused on protection and care actions through intervention strategies, aimed not only at the emergency and post-emergency period but also at offering preventive measures. To adapt or to be resilient does not mean to give up on the search for beauty in design processes, but to redefine a precious balance with urgent energetic and environmental issues. Some considerations emerged related to the current meaning of the word *resilience* and the role of *time* in architectural design. The word *transition* in itself, which identifies a common condition of contemporary places, introduces the idea of time applied to design proposals. It is possible to observe how architecture is no longer linked to a state of permanence and immutability, but, on the contrary, it is an increasingly flexible discipline, open to continuous transformations. In transitional contexts, new design paradigms emerge that envision flexible projects, developed according to different times and phases and, above all, are capable of combining aspects of sustainability, specificity and beauty (Navarra 2017).
Nowadays, most contemporary cities and urban contexts have started to study and apply intervention strategies for infrastructures, residual areas, urban public spaces and coastal areas, and to modify the transitory concept in different ways and forms. In the Italian context, we have witnessed numerous and other uncertain situations; Italy is a country that has been able to rebuild itself many times, following natural or accidental calamitous events. The most recent of these was the collapse of the Morandi Bridge in Genoa, which took place on a day of heavy rain on 14 August 2018. It shows how the Italian infrastructural system represents a complex heritage, subject to low maintenance, which demonstrates all its latent fragilities.

What could be the role of architectural design? What role does it play in the definition of scenarios and tools to work in unstable contexts?
First of all, it is necessary to build *shared knowledge* of projects, processes and policies; a *common ground* that could help collect possible virtuous design solutions to be implemented and adopted to deal with unexpected events. In this framework, the objective could appear particularly ambitious, but also

Figure 1 – Shop in the historical city of Norcia closed after the earthquake, August 2019. (photo: G. Setti)

Figure 2 – Forms of protection in Norcia, after the earthquake, August 2019. (photo: G. Setti)

Figure 3 – Temporary architecture for commercial activities in Norcia, August 2019. (photo: G. Setti)

challenging and urgent: to try to relate different but comparable cases, contexts and design interventions because they are facing similar transitory conditions. The ability to assess the *risks* of places where we live is necessary for the design. It implies the possibility of punctual actions through the design of new public spaces that could mitigate difficult integration situations and could guarantee sharing spaces. Or, it means reflecting on the state of conservation of infrastructures and mobility networks to act, on a larger scale, on securing them. In this sense, the fragilities that the Italian territory shows represent a great challenge for architectural design for the possibility of overcoming and reducing them through interventions on existing buildings or infrastructures and, therefore, working on the resilience of architecture and inhabitants.

Fragilities shown by the Italian territory represent a challenge for architectural design, precisely for the opportunity to overcome or reduce them through interventions on the existing heritage and, therefore, working on architecture and inhabitants' resilience. It is a powerful and ambitious challenge: architecture could secure unstable places; it could act in delicate and uncertain situations, consolidating them. A set of design solutions seem to emerge, they focused on critical topics already described above: the temporality of design, the search for *beauty*, the role of nature and the increasingly daring forms of re-naturalisation. In the research field around architectural design, these topics show considerable relevance and importance. Nature and increasing forms of re-naturalisation represent a possible design response: nature could become a design tool that is useful for facing unstable contexts and searching for a better relationship between environment and architecture. *Looking back to nature* means rebuilding a relationship between design and environment, enhancing the aesthetic and functional role it could bring to our cities. It is a matter of redefining a balance between nature and cities, no longer mystifying the use of natural elements but, on the contrary, enhancing its possible relationship with historical and urban contexts, increasingly seeking an improvement in living and environmental conditions. There are also interesting approaches to *flexibility* in architectural design and its capacity to adapt, as already described previously. In future (urban and architectural) scenarios for contemporary cities, it is crucial to observe how *design paradigms* change in both a European and international context. The concept of flexibility requires rethinking our way to design, renouncing extensive urban design projects in favour of punctual interventions, and partially reactivating places and communities. Due to social, economic, urban and environmental fragilities, the architectural design could work adaptively, capturing the significant and peculiar characteristics of different contexts where it is called upon to intervene.

At the same time, *instability*, denounced by contemporary contexts, requires redefining tools and design actions able to act quickly, favouring precise transformations, but not renouncing strategic projects on a larger scale, like territorial or landscape ones.

If we think of sudden and dramatic events that are affecting our territories more and more frequently, we could understand how a high adaptation and transformation capacity could drastically reduce the adverse effects on the affected territories. In this framework, architectural design, which

works in precarious places, is forced to choose and select and to understand what to support or sacrifice: it is a *project of compromises* necessary to define intervention priorities. To work in resilient ways means that the architectural project has to be developed in extended and differentiated timeframes, which would also support the survival of local and autonomous forms of resilience.
As a design action, *adaptation* changes the initial state of places, architectures or territories but compensates it by constructing a new and safer balance. Architectural design, therefore, works increasingly in conditions of uncertainty and instability, facing emergency and post-emergency situations, which, often, could not be imagined or planned. Tools described in this short essay talk about the possibility of transforming design methodologies, favouring the construction of new flexible, adaptable and fast action processes.

Notes

[1] The present essay has taken references, and suggestions from the contents discussed during the seminar 'Design Actions in Urban Transitions. Architectural and Urban Design for Shifting Conditions' held in Politecnico di Milano on 30 October 2019. The current essay deeply investigates some aspects and issues discussed in lectures and debates during the seminar.

[2] During the seminar 'Design Actions in Urban Transitions', some European case studies have been taken as reference according to specific projects or experimentations developed to control the effects of climate change in the urban scenario.

[3] The exhibition, held at MAST in Bologna, from 16 May 2019 to 5 January 2020, has explored, through photographs of Edward Burtynsky, Jennifer Baichwal, and Nicholas de Pencier, the indelible footprint of man on Earth and their consequent risks.

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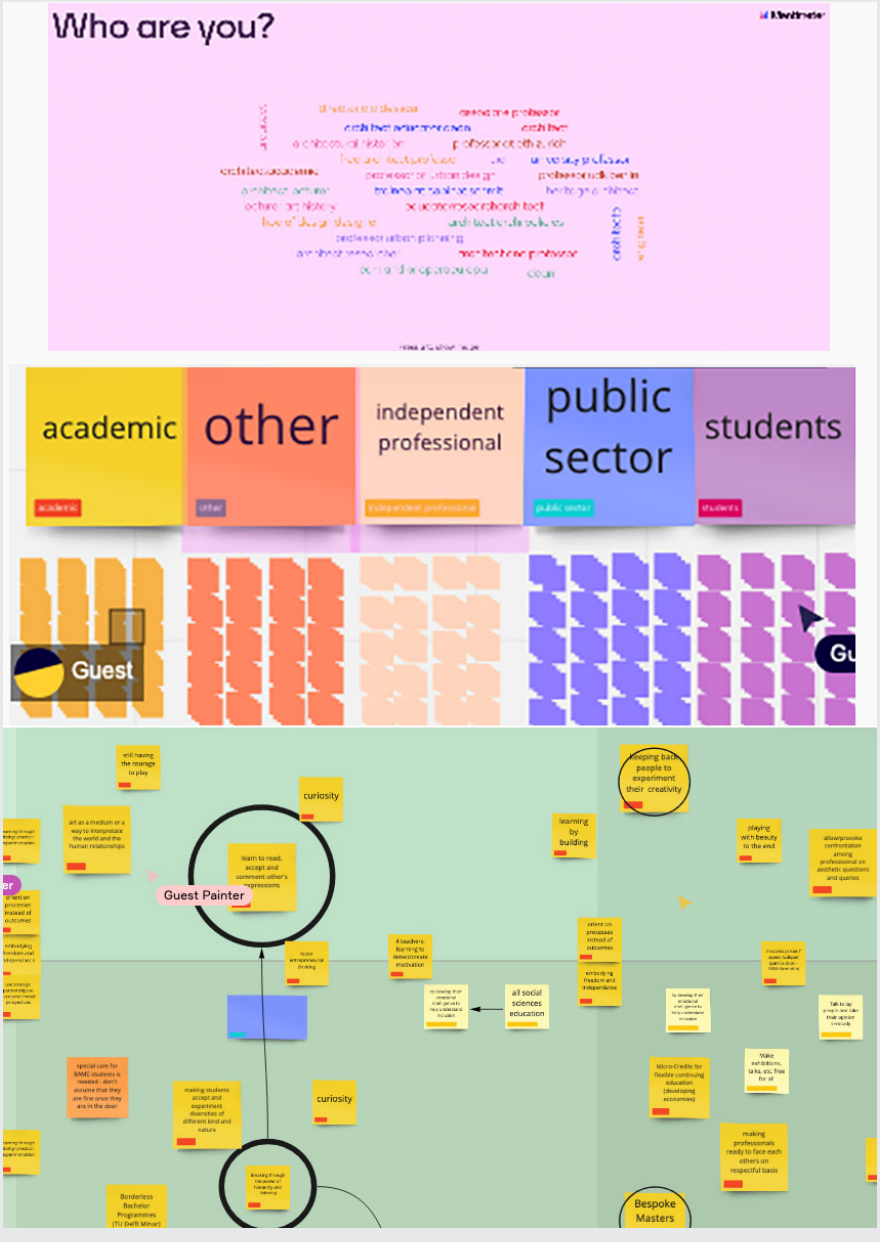
On (design) education

The second section aims to reflect on the role of training future architects. Precisely, in a perspective where they can acquire the theoretical and operational tools able to effectively influence, with their work, the transformation of cities in transition.
One of the primary aspects of training young architects is the cultural setting on which their education is based. Indeed, even if urban metamorphosis is often considered to be subjected to a constant evolutionary process, the concept of implementation (Solarek) is not understood and foreseen in the design process. Therefore, in academic context, it is necessary to start a training course in which the various variables enter the student's education and culture (Valente). Beginning a process of critical reflection also means accustoming the student to an unconventional use of the available tools to seize the countless opportunities that technology offers in the field of urban and territorial analysis.
Re-launching the role of a highly interdisciplinary educational path can also be an opportunity for students to interact with stakeholders, procedural aspects, and digital innovation.
The contributions describe various experiences activated in the field of teaching within the consortium. Here the experimentation is structured on the possible application of the project within critical contexts that summarize exemplary conditions of parts of cities in transition, configuring optimal testbed for students.


Who are you?
academic
other
independent professional
public sector
students
Guest
Guest Painter
curiosity
learn to read, accept and comment other's expressions
art as a medium or a way to interpretate the world and the human relationships
still having the courage to play
curiosity
making students accept and experiment diversities of different kind and nature
special care for BAME students is needed - don't assume that they are fine once they are in the door
Borderless Bachelor Programmes (TU Delft Minor)
all social sciences education
learning by building
keeping back people to experiment their creativity
playing with beauty is the end
allow/provoke confrontation among professional on aesthetic questions and queries
Micro-Credits for flexible continuing education (developing economies)
making professionals ready to face each others on respectful basis
Bespoke Masters

CITY MAKING IN TIMES OF TRANSITIONS. THE CENTRAL ROLE OF LEARNING

Roberto Cavallo

Introduction

Europe with its large variety of cities has to cope with a range of current challenges, such as rising urbanization, mobility, energy and environmental pressure. Already by now the environmental pressure on cities, due to extensive car ownership and use and due to the distribution of goods, have forced cities to limit access for polluting vehicles. Yet, the daily urban system of large and mid-sized cities is pushed to its limits due to an ever-growing mobility and transport demand stemming from metropolitan and regional spatial developments. While cities are attracting more and more people and will keep doing so in the next years, economic growth and social segregation are dividing them in neighbourhoods where its inhabitants are stigmatized by their identity and reputation. In short, the quality of living in our cities is under threat.

The cities of today and tomorrow need to consider more and more different and sometimes diverging issues in order to keep their attractiveness and become truly inclusive. But it is not only about reducing the CO_2 emissions and improving the built environment in terms of measurable performances. In this framework, the New European Bauhaus (NEB) initiative[1] launched in 2020 by the president of the European Commission Ursula von der Leyen, underlines the importance of linking the European Green Deal[2] to the people via more cultural and human centred ways of doing. Through the three pillars 'Sustainability (including circularity), Quality of experience (including aesthetics) and Inclusion (including affordability)', the NEB is pushing for the development of an interdisciplinary movement aiming at connecting people, built environment and nature, where art, culture and science play a central role to envision and design the future.

In short, the above-mentioned calls for stronger engagement of professionals in the built environment not only with users and stakeholders, but also with people and society in a broad sense. Therefore, linking professionals with each other, connecting various views and perspectives that are at the base of how professionals develop themselves, and at the same time enhancing inclusion and active citizenship, are fundamental steps to be made towards a better society. Learning and keep learning is herein pivotal.

[1] See: https://europa.eu/new-european-bauhaus/about/about-initiative_en.

[2] See: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en.

Imagine of the intermediate results participatory Lab '*Educating for the built environment: life-long and "life-wide" learning in arts, architecture and engineering*', NEBC conference '*Common Ground: Making the Renovation Wave a Cultural Project*'. (screenshot: R. Cavallo)

Learning across disciplines and design as inquiry

«For years my family poked fun at me for saying, after some hesitation, 'Bunt ist meine Lieblingsfarbe'. (Multi-coloured is my favourite colour). The strong desire to include every vital component of life instead of excluding part of them for the sake of too narrow and dogmatic an approach has characterized my whole life». (Gropius 1962)

This pandemic period is laying bare some vulnerable sides of our society. What is happening in this remarkable time confirms the fact that we have to relate more than ever to an increasingly complex and unpredictable reality and deal with a wide range of interdependent and unstable factors stemming from different disciplinary realms that are disconnected to one another. Uncertainty and wicked problems (Rittel and Webber, 1973; Buchanan, 1992) at the one hand, and the constantly growing drive for specialization that brought us into the 'era of hyperspecialization' (Malone, Laubacher and Johns 2011, Millgram 2015, Douglas 2018) at the other. Meanwhile, today's society has to face challenges that are becoming more and more integrative in their nature, requiring cooperation among different disciplines.

As early as 1919, among the basis principles of the Bauhaus, Walter Gropius advocated about the «[...] common citizenship of all forms of creative work, and their logical interdependence on one another in the modern world» (Gropius 1962). Working towards the training of next generation of professionals, with the emphasis on their cooperation which «[...] symbolizes the co-operative organism of what we call society» (Gropius 1962), was at the centre of the Bauhaus mission. And as matter of fact, after a century, we are facing similar issues. Let's pose the question to ourselves: where does the knowledge reside? Knowledge has many facets in our discipline, even if only looking from the perspective of architectural design. Without delving into what characterizes designing itself, considering the complexity of the challenges mentioned before, these days we have embrace the idea that the knowledge bringing us further can often be found across disciplines. This is clearly pointed out by scholars who argue that increasing specialization creates a continuous formation of fragments of specialities across disciplines (Dogan and Pahre 1990). This is further elaborated in the book *Transdisciplinary Knowledge Production in Architecture and Urbanism* (Doucet and Janssens, 2011). The authors state the importance of integrating academia and profession in knowledge production as well as the importance of experimental, designerly modes of inquiry.

In order to understand how to proceed in this framework of disciplines and themes, at the intersection of several, often diverging entities, designs should help in getting to know the various matters at stake, becoming themselves the main vehicle of inquiry and driving force towards the setting of agendas for projects.

Hence, the process of inquiry has an experimental character and it is a pathway in which hypotheses, theories, concepts and ideas are used as instruments to think (De Walsche, 2018) and problem-solving plays a role but it's not predominant. As the result of the inquiry is about getting to know, knowledge can be also transferred to new experiences (Elkjaer, 2009). Besides, when changes take place so quickly – as is the case today – that involved actors cannot generate stable ontological categories connected with their disciplinary realms, 'ontological uncertainty' may occur, a situation in which new generative relationships can arise, enhancing creativity and potentially leading to innovation (Lane and Maxfield 2005). Using design as inquiry can therefore strengthen design itself as a knowledge activity, at the same time connecting different issues into synergic interplays, fostering creativity and possibly leading to innovation.

Interplay between education, research and practice

In a world in which complexity and uncertainty make the typical engineering systemic way of problem-solving less effective, the designerly approach is increasingly gaining interest. Designing is a process in which possibilities and solutions are constantly sought and evaluated until the right concept is reached. It is a complex and very often cyclical activity that is far from autonomous, depending in fact from a large number of external factors, some of them being often even uncertain. This becomes very clear, and actually more complicated, when we have to tackle with complex built environment challenges of today and tomorrow. The recurring problem is that the involvement of many variables and factors of different nature and from different fields of expertise, is leading to a much higher degree of uncertainty. Consequently, the old-fashioned way of operating through separate disciplines and scale levels is not effective anymore. As changes are difficult to be predicted, to get grip on transformation processes is necessary to involve various disciplines throughout the different stages of projects. Research and education at the (technical) universities have to take into account this new condition, reflecting on its implications while deploying activities.

The above-mentioned framework applies in a strong way in and around the field of the built environment. Design is par excellence a synthetic act and can fulfil a key role when working with different disciplines in cross-disciplinary projects. Design and specifically architectural design have the potential to enclose ideas and experiments while balancing several heterogeneous components at the same time. For these reasons architectural design must be pushed more prominently to the foreground as an effective tool able to create synergies among disciplines, becoming in this way a precious added value in unravelling the multi facets problematic of current

and future urban challenges. The potential of architectural design will be relevant to further explore, understand and share knowledge on the ways designers can collaborate with each other and work together with other, sometimes not design driven disciplines. Projects like *Stad van de Toekomst / City of the Future* clearly emphasize that. It will be pivotal to further enhance the interplay between education and research in multidisciplinary settings, reaching out to professional practice as well.

The way ahead; life-long and life-wide learning

Within the New European Bauhaus initiative, several European network organisations, such as the EAAE (European Association Architectural Education), ACE (Architects' Council of Europe), ECEC (European Council of Engineers Chambers), ARENA (Architectural Research European Network Association), ELIA (Network of Higher Art Education), but also ICLEI (Local Governments for Sustainability), CAE (Culture Action Europe), TEH (Trans Europa Halles) and Europa Nostra have teamed up, starting the so-called NEBC collective[3].
Embracing the motto 'Making the Renovation Wave a Cultural Project', the NEBC network organisations joined forces in order to developed collaborative actions. The first step has been a successful conference that took place in April 2021, where the various drivers contributing to the design and the achievement of sustainable, beautiful and inclusive living spaces, were debated in participatory labs[4]. One of the labs was about education.

With the working title *Educating for the built environment: life-long and "life-wide" learning in arts, architecture and engineering*, the lab on education put forward the importance of 'learning' throughout all ages in order to nurture active citizenship and awareness, enhancing social inclusion. Life-long learning is key for expanding the knowledge of architects, engineers and artists about the common good of sustainable cultural and social development. Yet, to be truly inclusive we need to have a better consideration about who can access which education encounters and at which stage in their lives, reducing limitations as much as possible; life-long as well as life-wide learning. A shared objective should be linking students, professionals, stakeholders and citizens of all disciplines and ages, reinforcing awareness and sensitivity through multi perspective approaches. During a lively discussion, animated via an interactive Miro panel, it became clear that sharing experiences, starting with sharing the ways we see things in our world, is an important point of departure. It is about educators becoming learners and are able to position themselves more side to side to other learners. We should create the conditions to stimulate these interactions to exchange viewpoints and knowledge across disciplines and ages; herein the ludic aspect, having fun together, can play an important role.

[3] See: https://www.ace-cae.eu/activities/new-european-bau- haus-collective-nebc/.

[4] See: https://www.ace-cae.eu/activities/new-european-bauhaus-col- lective-nebc/nebc-conference-programme-2904/.

Ultimately, while pondering about learning, a shift is needed from keep measuring knowledge and competences, such as in the case of exit qualifications of education, towards disposition, attitude and approach. More initiative and specific projects are needed where the different disciplines, groups and ages can be brought together.

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URBAN DESIGN BETWEEN CULTURE, NATURE AND SOCIETY

Kristyna Solarek

There are reasons to say that urban design is at a critical and important juncture. Many arguments indicate it is in crisis, the complexity of urbanisation processes that cannot be controlled, granting a key role in creating cities by local communities, or a laissez-faire policy run in some countries, all these give less and less space for conscious spatial creation. However, that does not mean that we should stop teaching urban design, *poiēsis*[1] , by which culture, nature and society can be integrated. On the contrary, if we do not teach future architects this art it will disappear completely, and yet no other specialist will there to replace us. But experienced planners and urban planning scientists know very well how difficult it is to translate ideas into final and finished results. They know how great social expectations are today, so that it is not from architects but directly from the most important stakeholders of planning processes that urban ideas emerge. So, we have to make our students aware of their role and teach them to listen to the voices of future users of the buildings and cities which they design for.

At the Faculty of Architecture, Warsaw University of Technology, we are struggling with these issues on a daily basis and we are now at a turning point. Some academics advocate the classic approach to urban design, teaching the principles of composing space, without taking into consideration whether such projects could ever be implemented. Others boldly follow all the new concepts of space management and cities visions but do not always know how to translate them into spatial form. It is only at the Master's degree level that we manage to reconcile the supporters of the first and the second approach and this is probably a new and promising perspective to urban design teaching at our faculty. It seems that the biggest challenges today relate to two groups of topics:

1. Thinking about recipients of projects from the very beginning of the design process and gaining social competence for architects to work with various stakeholders so that their ideas can be fully implemented.
2. Looking for the urban design paradigm to meet expectations and put city users in the foreground but treated as part of the urban ecosystem, which means designing green, economical cities that are, at the same time, beautiful and convenient.

[1] *Poiēsis* (Greek) – an act or process of creation: «[…] in Greek "poiesis" – was a form of reconciliation between man and the world». Pérez-Gómez, Alberto. 1985. *Architecture and the Crisis of Modern Science*, Cambridge, Massachusetts: MIT Press. p 10.)

Concept of a part of the city of Bydgoszcz, Poland. Master's thesis, author: Marek Kaszewski, supervisor: Krystyna Solarek. (drawing: M. Kaszewski)

Thinking about the recipients of designs

The processes of empowering citizens by including local communities in spatial planning and city management have changed the approach to planning processes and methods in recent years. The participation of designers in planning processes is currently associated with two main problems at the level of relations with stakeholders, and they are significantly different and have divers bases: (1) omitting architects and designers in the participatory processes, and (2) lack of town planners' preparation to work with the local community.

While there is not much we can do in the first case, we have a huge role to play in the second. Architects often do not cope with the situations which they are put into in the course of public consultations. The 'Negotiating workshop' of the architect-urbanist is usually not sufficiently mastered, and even when the help of negotiators, experienced in building relationships with various representatives of planning processes, is used, the designers are required to enter a completely new role. The skills of social dialogue are those competences that an architect-urbanist should learn and improve, and this is not always the case. Today, the key skill is the ability to be flexible in responding to opinions and comments, and to refrain from premature and unjustified imposition of one's own ideas. At the same time, the ability to persuade vis a vis solutions with strong substantive justification and to capture expectations and intentions that representatives of local communities cannot often articulate is important. An open system of urban planning should be accepted where the designer goes beyond the closed circle of his/her experience and talent, starts creating the project from knowing the expectations of the residents, becomes a mediator and an equal participant in the discussion about the city, and not just a designer who shows a ready-made vision.

We see that if we start to discuss these issues with students, they are very interested and strongly drawn in. We organize workshops during urban design courses, where solutions are developed together with local communities and local governments. We are looking jointly for flexible societal solutions, varied, open buildings, which can be adapted to the changing needs of families or groups, and sometimes to take on new functions if needed. We test new forms of shaping the diverse functions of the city, conducive to satisfying various social needs. We design applications and tools to facilitate and improve communication with the design recipients.

Young people often take up socially important topics themselves, and the greatest interest in this issue can be seen in diploma projects, especially in Master's degrees. These projects are preceded with research on the features of scientific work. There are, for example, design topics related to improving the security of urban space, increasing the housing offer and its diversity, offering functional flexibility of cities, including mixed-use developments, creating

urban structures conducive to shaping social bonds and civic attitudes, or creating urban prototypes that are useful in space management.
As such, we have the impression that students are sufficiently sensitive to social issues with this method of work as they begin to realise that they will not always have the first and last word in shaping cities. Teaching students that they will be one of the many co-managers of space is a serious task for us. On the other hand, another serious task is to teach them how to design in the best possible way. However, the question is, do we even know how to design cities?

Looking for the urban design paradigm

Urban design has become more difficult given that decades of generally accepted urban paradigms do not apply any more, and the diversity of new ideas for shaping cities and ideas for improving them has made it impossible to determine the desired forms of spatial development. Nobody knows what this 'right' form should be, we can only keep on trying to find the answer. Today, we meet with dozens of ideas for contemporary cities, or rather adjectives, which are to define the desired direction of the city's development. Many of them in no way refer to the issues of urban design, some of them in part, but in many we should look for features that could provide the appropriate urban design. Urban designers work today in a maze of urban ideas, both widespread and niche.
One general trend is 'ecologisation', although it is unclear whether this process is based on purely ecological motives or whether it is also being provoked by a change in the energy supply and demand or fear of losing resources and of climate threats. This postulate, however, brings us closer to the problems of urban design than the general concept of sustainability. Including such topics as, for example, smart metabolism, circularity, green urbanism, a healthy living environment in the project tasks are significant. Interestingly, these topics are often associated with solving social problems, including those issues which were previously discussed.
Many of the latest urban designs prepared at our University show that there is a trend, in which the topic of the city's natural environment is responsibly addressed, and the natural elements are incorporated into the spatial structure, and often the design concepts are even based on them. A great deal of emphasis is placed on the solutions ensuring proper climatic conditions and increasing the resilience of cities to unforeseen events (including climatic ones). We try to convey to our students that healthy, safe, comfortable and resilient cities require taking into account the broadly defined natural structure, both when assessing their development opportunities and making specific spatial decisions. The necessity to consider the contribution of natural ecosystems to the broadly understood human well-being has become indisputable, and one of

the ways to use these so-called ecosystem services is the introduction of green and blue infrastructure to cities. In design solutions, this aspect is appearing more and more often, and the same applies to the scientific research and expert work of our university. In more mature design works, performed in diploma theses, there are also other ideas regarding urban design. These are concepts related to the circular economy or advanced urban projects related to energy topics. They correspond to the issues of scientific research conducted at the faculty.

Conclusions

Today, after years of criticism on Modernism and the search for new urban concepts, the view has clearly crystalized that one of the most important challenges in transforming urban structures is finding solutions that ensure the safety and convenience of urban residents and protection against various negative phenomena through coexistence with nature. It aligns with the approach that promotes compact, economical and inclusive cities. However, it is becoming crucial to enable cities to adapt to climate change through the appropriate shaping of their spatial structure, but with the awareness that as designers we are just a small cog in the machine that drives the development of urban structures.

PATHS FOR RESEARCH AND DIDACTIC EXPERIMENTATION

Ilaria Valente

There are initiatives that help to build research and teaching networks around specific topics. In this respect, a series of experiences that started with the Horizon 2020 Calls have begun to trace a common path between some universities which, as diverse observers, deal with the issue of climate change.
The *City of The Future* workshop, during the Venice Biennale 2018 and the two Horizon 2020 calls *City Making in Transitions* (CiMaTra) and *Turning Neglected spaces into active social and ecological resources through Nature Based Solutions* (TuNeS) configured some shared research methods that question the perspectives and techniques of architectural and urban design against the problematic scene of global warming and climate change. The workshop and the construction of research programmes provided the possibility of an interesting comparison and the construction of a network of relationships useful for strengthening basic research and experimentation in the field of teaching.
Hence, the opportunity to further develop the consortium not only for research but also for inter-university training activities. The fruitful exchange began with the International Workshop 'The City of the Future' and was the first opportunity for students from the various Schools of Architecture involved to meet, and then a renewed opportunity was the organization of the seminar *Design Actions in Urban Transition*. Particularly now, in which the objectives of the *European Green Deal* are explicit and the *New European Bauhaus* initiative took shape, it is useful to increase the exchange between European Departments and Schools of Architecture, focusing on the themes related to climate change dynamics and the effects on shifting urban conditions. This opportunity can take place through forms of interchange between teachers and students of the different nationalities, such as the 'collaborative classrooms' or the 'joint studios' in which the design topics can be shared. The perspective of a common dialogue is now also facilitated by the adoption of the digital platforms which were forced upon us during the pandemic, but which can become tools for increasing continuous collaboration.
In this last year, an increasingly important critical reflection on the relationship between man/nature and artifice/nature has taken shape, which is having important repercussions on the theory and practice of architectural design. We are undoubtedly facing a paradigmatic change that stems from the awareness of

Design Actions in Urban Transition **seminar with students –**
Moment of discussion between professors and students.
(photo: Y. Nooradini)

the limitation of resources. This suggests the need to expand the tools and objectives of architectural and urban design in the practices of transformation of the built environment beyond some simplifications offered by the narrative of a desired general re-naturalisation of urban areas.
Contemporary urbanisation is a theme and a problem which takes on different connotations in Europe and around the world. In the TuNeS research project with Latin American universities, for example, we have proposed a reflection on megalopolises.
There are some specific design topics that invite for reflection, while also evaluating the results of the era of the great European urban projects that developed between the end of the 70s and the crisis of 2008: how to conceive and shape new public spaces to be created in residual or underdeveloped areas within the urban fabric; how to conceive a different idea of infrastructure as a variable support for better use of architectural, urban and environmental resources. How to design and improve the resilience and sustainability of urban systems within 'buffer' zones, on the edges of urban spaces or in patch zones within natural areas. The open spaces and neglected built-up areas offer a fertile ground for urban regeneration, which in European cities and landscapes are mostly the fragments of the infrastructures and productive areas of the 19th and 20th centuries. At the same time, the role of design disciplines must be redefined with respect to other disciplines, which, inevitably, need to be involved in design actions, in particular, the scientific disciplines when we have to face climate change, environmental resources, new smart infrastructures and digitalisation. In this respect, the project must affirm its role as a synthesis of the stratification of knowledge involved in the practices of punctual transformation of contexts and in urban policies. The stratification of knowledge, of practices and of the diverse disciplinary tools must be addressed with precision, not only in the field of research, but also in the teaching of architectural and urban design.
The research field must be addressed in various aspects, starting from a different mapping (or stratification) of the knowledge involved and of the practices; from the definition of new tools; from the definition of new figures of designers with the skills and knowledge necessary to lead teamwork. The projects developed in specific case studies, comparable in different contexts, are the necessary support for research, which for us can only be research by design.

Starting from this perspective, we can think about a new era that recovers «a strong experimental approach to the teaching of architecture» (Valente 2020, 48) and launches a reflection on design teaching. The aim of the AUIC School of the Politecnico di Milano is to promote the culture of the project through recognising the innovation of processes and experimentation that appears

increasingly necessary to form 'habitats' which are able to respond quickly to the increasingly accelerated conditions of crisis that the contemporary world is unfortunately going through.
The experiences that offer areas for experimentation on how to combine training and research to build adequate skills are increasingly valuable. Skills able to «address emerging problems and challenges: from new forms of living to the role of architecture and of the architect within the framework of the great metropolitan realities; to reactivating the built environment through the practice of insertion, to environmental and social sustainability, to climate change, to the restoration and protection of architectural and landscape assets.» (Valente 2020, 52). In this regard, the exchange of experiences within a European network such as the one involving Warsaw UT, TU Delft, Ljubljana University, NTU Athens and the Politecnico di Milano has a particular value.

Each University, indeed, brings an important contribution in terms of contents, multidisciplinary approach, research methodology, sharing of experiences with local actors and reversing operational impacts for the territories and the communities. The fruitful exchange also passes through a didactic approach to the research questions where students are asked to act and position themselves in the form of exercises, precisely to begin establishing their own professional profile capable of responding to the needs and questions that communities, cities and territories place today and will place in the future.

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Viewpoints

(RE)DESIGNING URBAN NETWORK SPACE FOR CITE VERSAILLES BRUSSELS —

Raf Ilsbroekx and Maarten van Acker

Sixteen Master students in Architecture at the Faculty of Design sciences at the University of Antwerp, elaborated during one semester an explorative research by design, on the urban network space of the social housing area *cité Versailles* in Brussels. This research is embedded, as a preliminary trajectory, in the Horizon 2020 project URBiNAT[1].

The URBiNAT project is titled 'Healthy corridors as drivers of social housing neighbourhoods for the co-creation of social, environmental and marketable Nature Based Solutions (NBS)' and thereby focusses on the regeneration and integration of deprived social housing urban developments (Figure 1)**. Interventions focus on the public space, taking the full physical, mental and social well-being of citizens as its main goal, aiming to co-plan a healthy corridor as a flexible NBS, which itself integrates a large number of micro NBS emerging from community- driven design processes** (Figure 2)**.**

The social housing neighbourhood *cité Versailles* is characterised by a vast, yet enclaved open green space. Once reserved for the construction of an urban highway, today the residual space leaves a remarkable green scar as a misplaced piece of heritage of the automobile era. Additionally, the neighbourhood is developed at the 'edge' (Figure 3) **of the Flemish Region and the Brussels Region. The Northern Flemish part is planned as an agricultural area, the Southern Brussels part is planned as a dense social neighbourhood.**

The depicted extracts from the students' works emphasise on reconnecting the relation between agriculture and the city and on circularity of materials. The students' elementary design instruments to realize these connections are the concepts of 'path and node' (Figure 4)**. Despite the explorative nature of this research, the results nonetheless unveiled the specific potential of this site as a new type of urban hub, seen its strategic border location, unrolling a functional agricultural route to the city, arranged as a mobility node and programmed as a periodic point of sale. The design anticipates the increasing need of space for social economy and co-creation. Moreover, the social isolation of the neighbourhood could significantly decrease by creating such functional passages and by locally densifying the pedestrian grid in this car-oriented surrounding. Thereby, a reversed process of 'from flux to frame'** (Figure 5) **is applied.**

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Notes

[1]. See: https://urbinat.eu (Last access: 16.03.21)

Figure 1 – Macro scale aerial view.
(source: Satellite view)

Figure 2 – Macro scale conceptual masterplan.
(source: Satellite view, students' edit)

Figure 3 – Meso scale map.
(source: University of Antwerp)

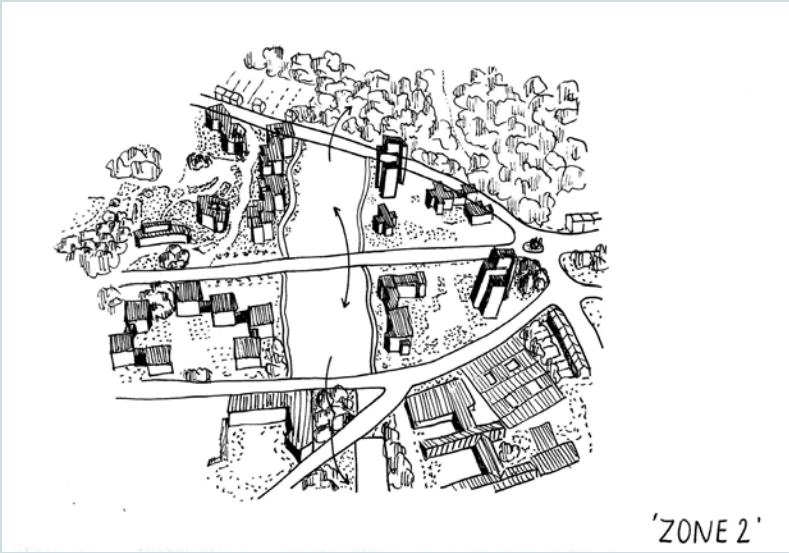

Figure 4 – Students' sketchat micro scale, the current vast and enclaved open space at cité Versailles. (source: University of Antwerp)

Figure 5 – : Photo of the enclaved open space at cité Versailles. (source: Streetview)

Figure 6 – Students' design, depicting an agricultural and circular path between social housing blocks. (source: University of Antwerp)

Figure 7 – Students' collage of a multifunctional pavilion accompanying 'the path'.

Figure 8 – : Photo of the Leeuwoprit bridge in Brussels.
(source: Streetview)

Figure 9 – Students' image of a redesign for the Leeuwoprit bridge.

TURF WARS AND BEYOND: PLAC DEFILAD IN THE HANDS OF LOCAL STEWARDS —

Artus Jerzy Filip

Few places might seem as calling and as alluring for urban planners, architects, and designers as the very central space of Warsaw—Europe's largest, yet hitherto unfinished, public square: *Plac Defilad*. By any standards, it is a design challenge *par excellence*.

Initially called Stalin's Square upon its opening in 1954, Plac Defilad has remained an overwhelmingly monumental space in front of the Palace of Culture and Science, the communist skyscraper raised in 1955. Throughout the second half of the 20th century, the vast open space served as a place of political manifestations, religious gatherings, fairs, concerts, and commerce. Even though the enormous space has been consequently subjected to various plans and designs for redevelopment, none of them have been executed. Until recently, the most tangible result had been a zoning ordinance providing for partial development, with new buildings expected to shape a smaller, reduced public plaza in the middle of it. Only lately a design competition for the new square was decided, and the construction of the Museum of Modern Art was begun. But Plac Defilad is still seen as a proof of the indecisiveness of local authorities. Worse yet, it is a slap in the face of traditional planning, designing, and decision-making routines.

Plac Defilad seems to be a 'normal' design challenge at first glance only. In fact, it is a scene of cross-sectoral turf wars, against which the design challenge and the designers themselves remain subsidiary. After all, how is a designer supposed to approach a task that is not only complex and difficult (this is to be expected), but in which it is unclear whose needs should be addressed (highly challenging, but hardly new), and, worse still, in which the very subject of the debate and the design are no longer apparent? As long as there is no single, unambiguous, and commonly shared understanding of 'Plac Defilad', how the hell can we place-make it together?

TURF WARS

Not surprisingly, an urban-design challenge such as Plac Defilad attracts the attention of pretty much everybody. The list of potentially interested parties – governmental, institutional, business, and civic – is endless. And that is fine. All of them have radically different perspectives on the subject, fundamentally different opinions on the existing conditions, and conflicting expectations about the future. And that is fine, too. But they at least might have a shared understanding of what the exact subject of the discussion is. Unfortunately, nothing could be further from the truth.

This is what the battlefield looks like today. A random person would likely answer that Plac Defilad is literally everything around the Palace of Culture and Science, considering the fact that there are no spatial boundaries but

the surrounding streets. However, respondents associated with the Palace would most likely say that the square is just a small area in front of the building. Similarly, the organizers and participants of the annual summer festival called 'Plac Defilad' would use this term to refer to the part of the square where the events are organized. Meanwhile for one of the theaters, the square is partly on the east side, and partly on the south side of the building. Furthermore, for the new-coming institutions, Plac Defilad mostly refers to the part that stretches down to Marszałkowska Street. And, last but not least, there are a few private owners whose parcels are randomly scattered all over the place.

This identity hodgepodge does not become any less confusing when one seeks help from city-government officials. According to the current zoning and the recently organized design competition guidelines, Plac Defilad is either a small public plaza to be shaped by future buildings, or, to be precise, it does not exist at all, because the authorities decided to use the working term Central Square instead, bringing even more ambiguity to the dilemma. And the administrative borders – which are, at least, clear-cut – remain simply insignificant: unrecognizable on the surface, and irrelevant in terms of public-space management. Even though the whole area is governed by the Palace, its central part is given to the 'Plac Defilad' festival organizers, out of which, in turn, a small part has been placed in the care of one of the theaters. And none of these borders has anything to do with the bureaucratic delimitation of the square.

The meaning of the 'turf wars' mentioned in the title should be apparent by now. A turf means some area of influence, such as my part of the neighborhood, or your field of expertise. When a turf is something I own, you'd better beat it. When two or more people or organizations are in competition over a turf, this means a turf war. The term has come into common usage with regard to street gangs: they have their turfs, and you might even not know about the borders, but those gangs know them pretty well. And if the borders become unclear or some parties aim to extend their spheres of influence, turf wars ensue. You would barely recognize the turfs just by observing what is happening on the surface. Turfs' definitions are not exposed, but are well known to the ones who claim them.

The term 'turf' was first employed in the field of urban planning policies and design analysis by a group of researchers affiliated with the Urban Field Stations in the U.S., who introduced a method of mapping various sorts of activities focused on spatial conservation or development issues: Stew-Map. More than twenty years ago, they began collecting data on who takes care of what in the city of New York. According to the Stew-Map's conceptual framework, those who took responsibility for particular parts of the city, even without being the owners, were referred to as 'stewards'. The parts of the city that were under the care of the stewards, in turn, were to be their 'turfs'. The aim of the Stew-Map has been to learn where turf's borders are (and whether adjacent groups cooperate), if there are any 'non-occupied' areas (and who could take care of them), and especially what happens when turfs overlap: what do turf wars look like.

PLAC DEFILAD LOCAL STEWARDS

No doubt, to design and develop urban spaces in a state of turf wars is difficult. Not that a single party could not undertake the challenge and commission

the design on its own. Public authorities in particular could do so. But sooner or later, the turf-related conflicts would come to light. It's better to play it safe and seek ways to address turf issues before they blow up. Especially that in particular cases, different stewardship groups with overlapping turfs are capable of forming successful alliances, and only then, jointly, getting into design and implementation tasks.

On Plac Defilad, the challenge to form a cross sectoral coalition was undertaken by a couple public institutions of culture located in the square, the ones whose doors were to face the new plaza in the future. They decided to strengthen their on-going collaboration in order to support the present redevelopment process and, eventually, even manage the public plaza itself. The group argued for deeper functional and aesthetic interdependency between the new public square and the public institutions of culture. They have basically declared the plaza their shared turf and, based on this premise, claimed their right to remain active participants in the planning, design, and future land management process.

Following a design workshop organized exclusively for them, the group managed to formulate a joint list of precise design recommendations, thus showing the potential to speak with a single voice. Later on, the group organized a few internal meetings in order to improve coordination between all the ongoing activities involving the square. The meetings were attended by architects working on the square's design, as well as by city representatives. These events proved how necessary such enhanced collaboration was, since both meetings provided essential but otherwise inaccessible knowledge on the ongoing issues for all the participants, the designers included.

The partners introduced the idea broadly during a public exhibition and through public debates at which heads of partnering institutions jointly set forth their vision of the future plaza being managed and programmed in a manner that was unprecedented by Polish standards, and offered this proposal up for public discussion. The idea itself was received positively, however, doubts were raised about whether or not such an arrangement threatened the expected democratic character of the public space. On the other hand, there was a shared expectation that city authorities would share planning and land management responsibilities more willingly. The Local Stewards might have played a key, in-between role in this process. Nevertheless, the fundamental question remains: whose turf would it truly be? If not everyone's, the turf wars are sure to break out again.

What might designers learn from this lesson? Simply, once we take up any public-space-related commission, we enter somebody's turf, a turf probably claimed by more than one party. Consider yourself lucky if there is already a group of stewards who invite you to the table to talk about their shared turf. At the end of the day, it is not about neglecting the turfs, but about sharing them.

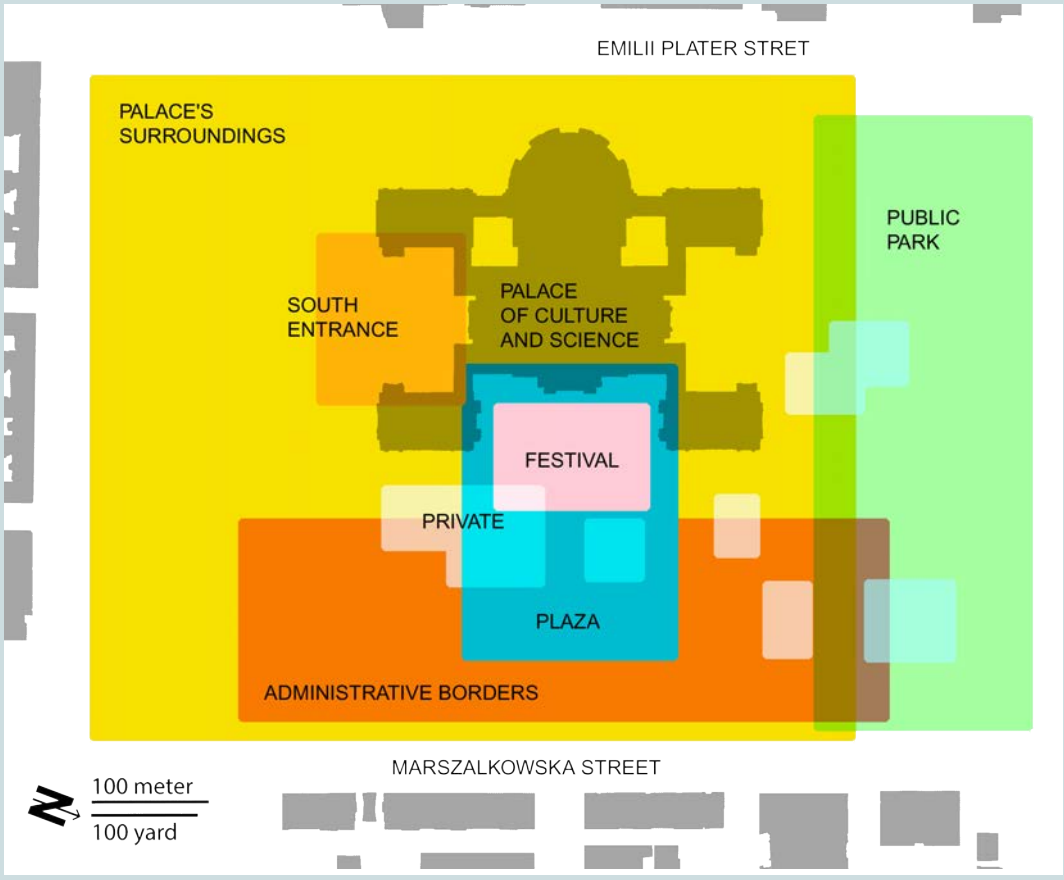

Figure 1 – The hodgepodge of turfs is a reality that designers of most public spaces must deal with. (drawing: A.J. Filip)

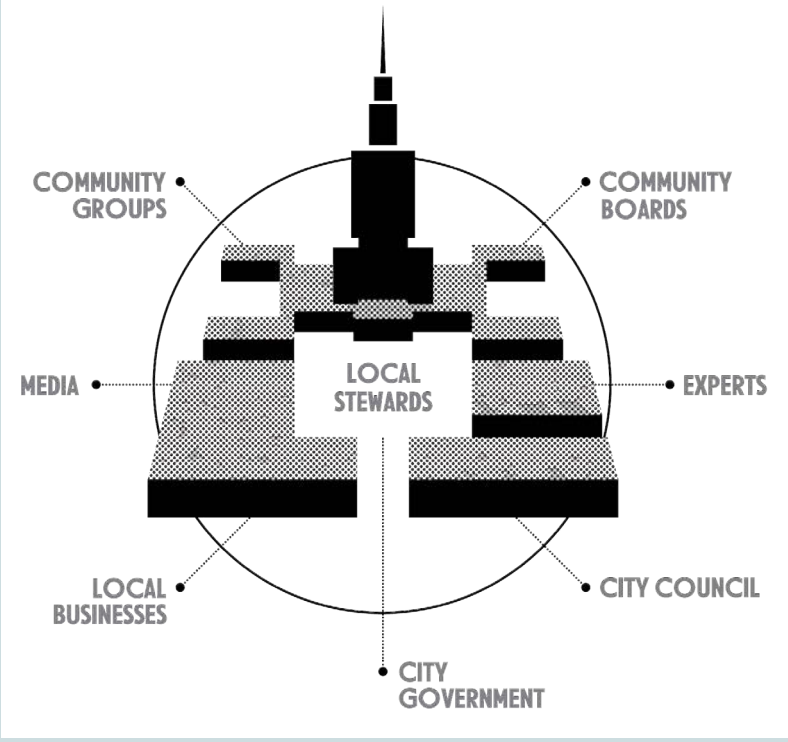

Figure 2 – Various individuals and groups with differing levels of activity might lay claim to a turf at any given moment. (drawing: A.J. Filip)

RECUPERATING THE COASTLINE OF ATHENS AS PUBLIC SPACE —

Thanos Pagonis

The paper introduces the problematic of design for shifting conditions in the case of Metropolitan Athens focusing on recuperating residual territory on the coastline as public space. The main idea promoted is that the content of design actions for urban transitions should be defined within the place specific contextual framework of urbanism, meaning the collective condition that shapes the production of built space and social relations formed around it (Pagonis 2018).

The conurbation of Athens-Piraeus (so called Attica Basin) exhibits a distinct type of urbanism, which is the outcome of 20th century urban development but mainly of the period following the post-war rapid urbanization. Athenian Urbanism has been characterized as 'spontaneous' (Leontidou, 1990) in the sense of not being driven by the order of a predefined urban plan, yet at the same time being regulated by a set of rather strict and inflexible planning and building regulations which apply to the individual plot (Issaias, 2014). Its main characteristics are the 'small scale' and density, which has to do with the multi-investor financing scheme, as well as mixity and uniformity due to the policy of uniform distribution of development rights. Looking at the urban landscape from above it resembles a 'mosaic', where the individual building, or even part of it, defines the scale of the city, a situation that has been described as 'the collective imprint of the individual'. The combined effect of these characteristics has had a positive effect in generating urbanity and strengthening the affiliation of residents with urban space through home ownership, but has also created a problematic condition for the pursuit of collective interests and provision of public goods. The status of green and open spaces typically exemplifies this. These are often residual spaces that remain neglected and 'un-designed' because no one is interested to invest on them, either because they are protected areas, public land or simply land unsuitable for development. Most characteristically the territories which fall in this category are the periurban mountains, which form the boundary of the conurbation (Hymettus, Parnes, Penteli and Aigaleo), the hills of Athens, with Akropolis being the most prominent one, and the coastline, which according to the Greek law has the status of public land. (Figure 1)

After 1990 Metropolitan Athens faced important development challenges which have affected these valuable territorial assets directly and indirectly. The staging of the 2004 Olympic Games has marked a period of urban growth and large scale public investments in urban infrastructure which have triggered dynamics of urban sprawl in the peri-urban land as well as occupation of some open spaces for the construction of sports venues of metropolitan

importance. The crisis that followed after 2007 has halted the dynamics of sprawl but revealed the weakened urbanity of central areas that presented signs of urban shrinkage. Moreover, the effect of austerity governance which further constrained available funding for urban management was most notably felt in the abandonment of public spaces and green areas. The gradual recovery of Athens economy since 2016 due to the effect of urban tourism and real estate coincides with the emergence of new concerns for the effects of climate change within a context of rising temperatures and new threats, most notably the catastrophic flooding of Mandra (West Attica) and the devastating fire in the second home settlement of Mati (East Attica Coast) in 2017 which have led to the loss of many human lives. (Figure 2)

This paper discusses design work conducted in the School of Architecture of the National Technical University of Athens which focuses on rehabilitation of damaged landscapes and recuperating the coastline as public space within the problematic of urban transitions[1]. The area of investigation is Perama, a small coastal town located at the urban fringe on the west coast of Attica nearby Piraeus where industrial activities, such as shipyards and fuel refineries have traditionally located attracting the settlement of labour force. (Figure 3)

The town of Perama is the product of spontaneous urbanization by internal migrants, most notably islanders who settled there in two stages before and after the War. The main source of employment were the shipyards, run as private businesses but following common standards in terms of wages, working shifts etc. They gradually occupied all the coastline blocking access to the sea but this trade-off was somehow accepted by the local community given that they provided employment. The town developed horizontally occupying the available land in-between the shipyard zone and the mountain with some neighbourhoods built on high slope that makes them difficult to access. The uniform social and economic background of the local population has strengthened social ties and generated a strong sense of belonging which helped local residents to endure the hard living conditions and maintain their optimism throughout the years. Recent developments in the global economy however, have affected the competitiveness of the shipyards leading to loss of employment. Meanwhile, the privatization of Piraeus port by the Chinese Cosco following the interstate agreement - Belt and Road Initiative (BRI) - between China and Greece has led to the gradual expansion of container and car terminal functions, which now threaten to take over the entire town coastline for port infrastructure. (Figure 4)

The above developments represent major challenges which call for integrated urban interventions as the character of the town changes and employment structure diversifies. The municipal administration is actively claiming access to the coastal front for public use and enhancement of urban health and wellbeing. Local community, collectives or individuals, are also vividly claiming the limited and degraded free space for everyday activities. The area forms also part of a unique archaeological site (Battle of Salamis 480 BC) including submarine antiquities and historical remnants and monuments which expand up to adjacent Salamis Island.

Figure 1 – Piraeus coastine. The un-designed residual space of Piraeus coastline: a valuable territorial asset in time of shifting conditions. (photo: T. Pagonis)

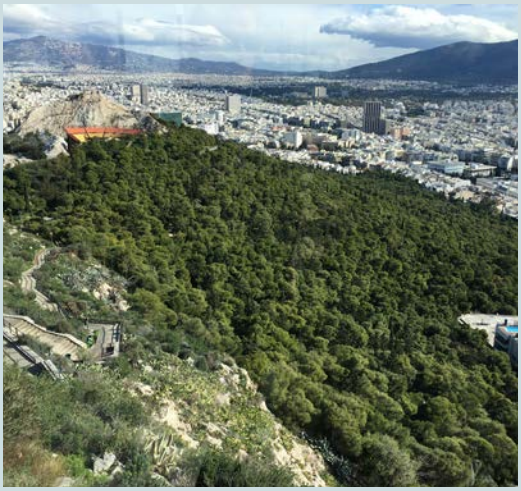

Figure 2 – Lycabettus Hill, a landmark of central Athens that has been affected by austerity was the focus of design actions for shifting conditions by the Municipality and the National Technical University of Athens. (photo: T. Pagonis)

Figure 3 – The coastline of Perama occupied by shipyard and logistics activities.
(photo: D. Loukos)

Figure 4 – The town of Perama developed in-between the shipyards and the mountain on high slope. (photo: D. Loukos)

The first stage of the design investigation focused on analyzing the evolution of territorial resources and mapping the polymorphic urban problems of Perama. The effect of harsh territorial boundaries on town structure was analyzed and spatial potential in the form of vacant areas and brownfields created due to industry shifting was identified. In the second stage priority design actions have been identified, which aimed at addressing the key problems with aim of maximizing the impact of interventions on citizens' wellbeing. The scope of interventions encompasses mobility transitions, promoting walkability and connectivity, reclaiming residual territorial assets as public spaces and improving their spatial quality and degraded landscape rehabilitation.

The centre spine of the proposed design actions revolves around the remodelling of the main road axis of the town centre into a limited traffic zone and green corridor promoting walkability. This is combined with unsealing of paved surfaces for overall improvement of environmental quality and heat relief. Walkability and connectivity is further enhanced by creating four vertical walking corridors linking the mountain and the sea with paths and public stairs, so called 'cracks'. The cracks activate the neuralgic public space network of the urban fabric that represents today residual space and penetrate the shipyard zone claiming access to the seafront.

Following up from the above, focused design interventions were ventured in the context of a design studio in two neuralgic spots at the two edges of the towncentre which represent today the only two sites where public access to the seafront is possible. These are a little fishing port (Armos) situated just adjacent to the border of Cosco facilities and a small beach, remnant of the natural form of the coastline, situated next to the Salamina ferry terminal (Terma) where has been in the past the terminal station of the old tramway linking Perama with Piraeus. The main focus of the design studio was on the rehabilitation of degraded coastal landscape and reclaiming residual territories as public spaces. (Figure 5-6)

The proposed design actions promote the transition of the town towards a more open, connected, healthier, and resilient urban and social environment with the aim of helping to alleviate the immense spatial inequality noted between the much advertized Athenian Riviera and the damaged coastal landscape of Western Attica. (Figure 7-8)

Notes

[1] The design work was produced in the context of a diploma design project carried out in 2018 and a landscape design studio of the 8th semester which took place in the spring of 2019.

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Figure 5- 6 – The fishing port of Armos, a degraded landscape which could become a vital public space. (photo: D. Loukos)

Figure 7 – The remaining natural coastline segment of ‘Terma’ next to the ferry terminal, a valuable asset for the community. (courtesy: Kostas Velanas, Evi Katsikoudi)

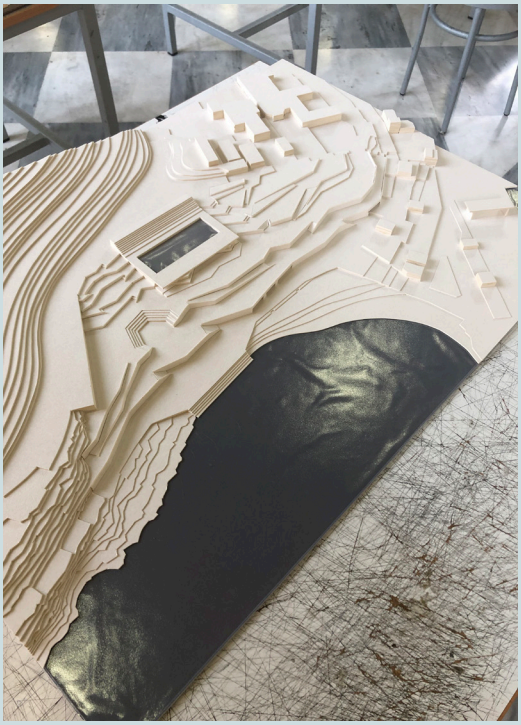

Figure 8 – Proposal for the redesign of ‘Terma’. (courtesy: Katerina Ouzounidi, Adrien Duchon)

Reflecting on Practices

The third section deepens the possible interactions between research, practice, and education through innovative methods and integrated actions.
Starting from a more general reflection on the urgency to reconsider climate change impacts on spatial urban dimension, the first contribution enlightens the emerging aesthetics and the current design processes overcoming technical approaches.
The two following papers of Jutta Hinterleitner and Laura Pogliani further specify the modalities through which the mutual interdependency between scientific research and design practice actions can occur, starting from two different experiences and perspectives. The research programs boosted by the BNA Research Department within the Royal Institute of Dutch Architects, involving professionals, education activities, public bodies, and stakeholders, propose alternative learning networks aiming to improve the collective responsibility about the social impact of new design actions. The expertise of Academic Departments, such as the DAStU (Department of Architecture and Urban Studies) from Politecnico di Milano, enhance the social role of research and its positive contribution to build multidimensional and multiscalar frameworks for urban and environmental regeneration actions, without renouncing to pose a critical perspective.
Specific viewpoints, focusing on the Italian and Greek contexts and debates, enlarge the discussion to the decision-making processes about environmental policies and the necessity to improve national and international stages for a shared discussion.


kijk me ogen, luister me oren

DESIGN STRATEGIES FOR URBAN RENATURATION

Fabrizia Berlingieri

Dynamics

By looking at contemporary urban design practices on environmental rebalancing, an expanded field emerges. Its foundations are based on high standards of specialised knowledge, where the predominance of eco-technicism appears to be the leading research perspective able to face and orient solutions for the crisis we experience. A multifaceted and structural condition that refers to several ongoing and connected phenomena related to Climate Change dynamics (Marvin and Bulkeley et al. 2018) affecting the habitability of the world's regions, also with the increasing massive urbanisation versus the progressive abandonment of agricultural land (UN 2018).

On a European level, the adoption of the *Pact of Amsterdam*[1] in 2016 and the *European Green Deal*[2] in 2019 show the advancement of policy-oriented actions to establish a shared framework through a more and more enlarged platform of participation[3]. EU policies, and their adoption on the national levels, profoundly impact the physical transformation of urban spaces, reshaping the contemporary cities' profiles. Indeed, several metropolitan areas have already adopted action plans to promote urban transitions, with a specific reference to adaptive strategies for climate change, profoundly directing the design discourse at considerably improving nature in urbanscapes[4]. A main concern regards the material and immaterial damages that climate change, in its most catastrophic manifestations, causes to the functioning of the urban systems. It must be said that it is a concern measured on the cities and metropolitan systems' economic scales. Adverting the consequences of climate changes costs more than 'accommodating' them, as much as possible, through the mean of urban adaptation to shifting conditions. But in this desperate race for remedies and short-term solutions to mitigate the effects of choices that have proved to be profoundly unjust and harmful, limited space is offered for broader reflections able to look beyond a perennial state of urgency[5]. Also, the contemporary dynamics reveal a progressive uncertainty of the global economic and political systems and claim for a paradigmatic shift (Bulkeley 2003) by questioning the spatial impacts on cities, which will be the main actors of transformation in the coming decades (Sijmons 2014). Beyond taking the hit and changing course to manage natural resources in designing more liveable cities,

[1] Informal Meeting of EU Ministers Responsible, Urban Agenda for EU, Pact of Amsterdam, 30 May 2016 Amsterdam, The Netherlands.

[2] European Commission, The European Green Deal, presented on 11.12.2019 in Brussels.

[3] «In order to address the increasingly complex challenges in Urban Areas, it is important that Urban Authorities cooperate with local communities, civil society, businesses and knowledge institutions. Together they are the main drivers in shaping sustainable development with the aim of enhancing the environmental, economic, social and cultural progress of Urban Areas.» Pact of Amsterdam, p.4.

[4] Among many others, some examples are the Rotterdam Climate Change Adaptation Strategy in 2015, the Paris Climate Action Plan in 2016, or the London Environment Strategy in 2016, see https://resourcecentre.c40.org/. Last access: 20.08.21

[5] About the binomial City-Nature, an original interpretation comes from the philosophical reflections of Rocca, Ettore. 2020. "Architecture: From Time of Mind to Time of Nature", *Techne* 20, 23-28.

Luchtsingel project and the Hofplein station, ZUS, Rotterdam 2015. (photo: F. Berlingieri)

we should not forget to aim for deeper thinking on precisely how it is possible to reimagine the relationship between man and nature, cities and nature.

«The Anthropocene is a world-engulfing concept, drawing everything and being imaginable into its purview, both in terms of geographic scale and temporal duration. Climate crisis, fueled by predatory capitalism, has the potential to embolden the powers that be to exert draconian controls over far-flung populations, unprecedented in nature and scope. Can we instead learn new ways of being in the face of this challenge, approaching the transmogrification of the ecosphere in a spirit of experimentation rather than catastrophic risk and existential dismay? » (Howe and Pandian 2020, 22)

Requestioning nature

In a time constantly turned to its present, actions mostly precede reflections. The latter is essential to broaden horizons, correctly pose the underlying questions, and demystify preconceived attitudes. Since the last decades, we have been overwhelmed by concepts such as sustainability, vulnerability, mitigation, and the latest of adaptation and resilience. This vocabulary guides our decisions as architects and researchers in the urban field. Yet, while it should represent a steady rudder to navigate in stormy waters, it often uses increasingly abused rhetoric. A clear example could be provided by talking about the spreading of a greening eco-imagery, populating almost every urban design proposal. According to Douglas Spencer:

«Ecological crisis, too abstract to afford easy pictorial representation, too much the product of complex interrelations and interactions seemingly beyond the means of individuals to comprehend or to address, is naturalized, reworked into the infantile projection of a ubiquitous greening of space for personal enjoyment.» (Spencer 2019, 169)

The contemporary city resizes its artificial footprint with the increase of new natural spaces, and this evidence clearly cannot be denied when looking at the ongoing urban transformations. New ecological corridors, wetlands, and forests are progressively substituting large leftover areas and residual or abandoned spaces that characterized the city's fast-growing last century. This process has consequences not just on the technical responses to the reduction of climate change effects but mainly on the appearance of new aesthetics, new ways, and values to perceive urban systems. For example, according to Mirko Zardini, Sensorial Urbanism is a different mode for design practices to explore the character and atmosphere of places for a broader understanding of urban settings (Zardini 2015). In this perspective, climate change and urban design are interlaced not

only with the scope of delivering eco-technical solutions, but their interrelation speaks about the new witnesses of a more profound understanding of the emerging phenomenon. The latter deals with offering alternatives and novel ideas on how common spaces can be reassessed by design from a semantic point of view. The most relevant experiences, currently reshaping the 20th-century ideal antithetic relation between nature and urban settlements, insist on the importance of conceiving a new co-inhabitance between the uncontrolled natural status of the environment with one of the artifice still structuring the common imagery of urban and metropolitan contexts[6]. According to Kengo Kuma, cohabitation arises from removing the Western scheme firmly anchored to visual perception, creating architectures as objects, as manifests of a manufactured world and autonomous in respect to the continuous natural cycles.

«As long as we insist on the primacy of visual perception, reject the absolute character of vision. This does not mean we simply need to introduce sounds, textures, odors. The answer is not to increase the types and numbers of percentual frames but to see whether or not we can make manifest that totality called "place" - a three-dimensional totality of such diversity that it defies easy description. That becomes our actual goal, once we set about trying to "erase architecture." Erasing the object, we must make manifest a place in its stead.» (Kuma 1997, 49)

It is also the main *j'accuse* of Juhani Pallasmaa when affirming:

«I believe that many aspects of the pathology of everyday architecture today can likewise be understood through an analysis of the epistemology of the senses, and a critique of the ocular bias of our culture at large, and of architecture in particular. The inhumanity of contemporary architecture and cities can be understood as the consequence of the neglect of the body and the senses, and an imbalance in our sensory system.» (Pallasmaa 2021, 21)

Although far from the radicality of their positions, it is inevitable to note how more and more often, contemporary urban design practices and theoretical approaches relate to terms such as character, atmosphere, and sensoriality. A new behavior based on the aesthetic experiences of closeness and immersion in a re-found naturality with the disappearing of a critical distance in design proposals, or an act of abstraction, toward the conceiving the spatial meanings of built contexts. Le Corbusier's birds-eye perspective, representing the modern city in its autonomy *vis a vis* the natural status of the ground level, loses the capacity to describe and define the world we inhabit, substituted by a new internal view that is non-hierarchical, temporary, and unstable. Urban

[6] See Buš, Peter. 2019. "Large-Scale Urban Prototyping for Responsive Cities: A Conceptual Framework", *Front. Digit Humanit.,* 6:1. DOI: 10.3389/fdigh.2019.00001.

Renaturation (Berlingieri and Valente 2021), which refers to the ecological restoration discipline, describes the ongoing, pervasive process of reintroducing the wild natural sphere within the urban contexts. It shapes a cross-disciplinary ground for diverse design disciplines, starting from urban planning, often translating policy orientations onto strategic guidelines for future sustainable urban visions and developments, influencing new spatial settings (Bulkeley and Betsill 2003). A second approach merges natural sciences and environmental landscape design, addressing ecosystem services to improve urban resilience through nature-based solutions (Kabish et al. 2018) and enhancing the presence of new blue and green natural infrastructures within the built context. A third setting, in which urban renaturation occurs in design disciplines, relates to urban design scale. Specifically, it refers to the remodeling of the open spaces that implies public areas (Pollak 2006), infrastructural leftovers (Nijhuis et al. 2015), or abandoned built complexes (Bergevoet and van Tuijl 2016) through reuse and adaptive design strategies. The first common feature between the three fields above described relies on performativity. The main strategical choices do not question innovation and quality of the spatial experience, limiting the evaluation of the results to an almost quantitative level (Gandy 2015). A second common feature is a sort of renunciation of the intellectual act of abstraction when designing natural spaces, a theoretical position of alterity between manmade interventions and natural spatial settings. It is not just a conceptual node visible in current architectural trends, but in general, it identifies a new cultural attitude. Indeed, more and more, architectural responses to climate change dynamics are reflected in proposals that replicate nature in the design of the city's open spaces, mimicking its forms even with a certain naivety. The design approaches that tackle the theme of natural – and technologically advanced – mimesis, consciously attempt to the co-inhabitancy of the urban matter, the artificial *par excellence*, with the life cycles of nature and even more proposing figurative replicas, with the risk of an almost ornamental approach to nature's interpretation through urban design.
How is it possible to test the concept of a new sensorial design, towards the co-inhabitance between urban form and natural space, in contemporary design practices without falling into unpretentious, and often economically unsustainable, attempting?

Reflecting on practices

A relevant shift in contemporary design approaches occurs not only regarding the increase of experimental practices involving a wide range of actors or stakeholders and building *ad hoc* procedures, but considering a different horizon in which these practices move. The interlacing of ecology, politics, technology, and social behaviour for the design of urban environments needs a broader perspective.

In fact, when approaching sustainable development and adaptation strategies, architectural aesthetics are overlooked, where this sphere could significantly define a semantic turn. As outlined in the previous paragraph, it transfigures a new perceptual experience of nature into the urban matter through the emergent aesthetic category of sensoriality. However, its translation onto design themes is approached with different priorities within the contemporary and most dedicated design practices, putting it in relation to temporality, to wilderness, and even transposing it on a more conceptual level of artistic expressions.

The theme of temporality in urban design has assumed increasing importance in recent years. From a compositional point of view, the design of public spaces becomes more and more a design of permeable and natural soil that supports the seasonal cycles and the dimension of the passage of time. One example is the work of the Danish firm of Stig L. Andersson (SLA). The projects for the renaturation of public spaces, such as the *Gellerup Urban Park*[7], a large redevelopment of open spaces within a social housing district, work with the seasons but also with the decay of time and the transience of the natural element. The spaces welcome dead trees where they build the nourishment of the soil in their status. But, on another level, temporality is also associated with a programmatic functional undefinition. The issue of the spontaneous growth of the urban spaces in a process of renaturation, has implications both at the social level and at the level of planning and development of the city. The spaces change according to the conditions dictated by the inhabitants, continually transforming under the establishment of different functions that restore the sense of community, rather than the image of a traditional public space. This strategy offers the replacement of design 'vision' and 'strategy' with those characterised by discrete and implementable processes, binding design results to a *permanent temporality* (ZUS 2016, 307). The results translate onto discrete models, whose construction materialises through actions and forms that however can be replicated beyond the contextual conditions and which evolve according to those conditions' changes. In that sense, the project's proposition corresponds to the demonstrability of its positive environmental impact, like, for example, the measurement of mitigation or adaptation effects to climate change conditions in the short or medium term, projected towards a vital technological innovation.

Parallel to that, other experimental practices engage urban renaturation through the concept of wilderness[8]. In this context, «the distinction between human artifice and ecological succession becomes progressively blurred» (Gandy 2006, 70). In this semantic reversal, the environmental focus is not just a moral dictate but a form-generative and sense-production for contemporary urbanscapes. The recent works of Piet Oudolf and Olafur Eliasson can provide some examples.

[7] Both projects, conceived by West 8 architects and urbanists, have direct references on publications and description on the website: http://www.west8.com/.
Last access: 20.08.21

[8] Regarding the meaning of wilderness as space or region, leftover by man to nature evolution reference is to Gilles Clements' position, contained in his books *Manifeste du Tiers-Paysage* (2003) and *Planetary Garden* (2015). Recent relevant research on wilderness in urban and metropolitan conditions is developed by the geographer and urbanist Matthew Gandy, for example, in *Natura Urbana. The Brachen of Berlin* (2015), see Gandy, Matthew, "Marginalia: Aesthetics, Ecology and urban wastelands", in *Annals of the Association of American Geographers*, 103:6, 1301-1316.

The Dutch designer[9] brought the concepts of spontaneity, structural complexity and seasonal interaction in his landscape projects to the international stage, primarily through his work on some of the world's most celebrated contemporary gardens and open urban spaces. An uncontrolled nature builds unexpected and changing scenarios through the careful selection of perennial plant varieties, where the senses of the users are fully involved, recovering an emotional state of immersion in the natural world.
The artistic and urban-contextual installations of Olafur Eliasson move on a more conceptual level, focusing on the perception of the space that surrounds us in environmental terms. Natural phenomena are at the centre of his interventions, and have been investigated in their scientific aspect and influence on human life.
Similar is the work of Studio Roosengaarde, which continually moves between the folds of artistic installations, temporary design of public spaces and experiments on the use of technological visual devices. Instead, the installations' contents focus on the evidence of climatic effects and the challenges they imply. Virtual and augmented realities become the keys to manifest environmental urgencies, and they foster a new imagery of urban open space and its experience through (augmented) sensoriality. Another practice that triggers the imagination of new worlds by intertwining technologies and design solutions is that of the architect Philippe Rahm. His approach relies on considering climate change as an opportunity by rethinking the architecture and urbanisation of the city from an atmospheric point of view, providing a new, even sensual, quality of life to its inhabitants[10].
The emerging aesthetics, briefly outlined by a few contemporary design practices, share an alternative way of looking at the relationship between environment urgencies and urban imagery, declaring the intent to go beyond merely formal trends, and addressing a broader reflection. Design disciplines, developing innovative processes and strategies, ask not for the provision of technical solutions regarding the ongoing transitions, merely following short-term horizons, but on the contrary, they deeply explore the potential in the background, dealing with a long-term perspective and anticipating future scenarios. Design research and practice aim for a radical change of attitudes that consciously accept precariousness and continuous instability as an operative framework, investigating the possibility of a 'real-time design' for the present urban transitions.

[9] The New Perennial movement, or New Wave Planting, refers to landscape design discipline, working on the contemporary reinterpretation of the romantic garden, starting from Chinese and English traditions. The complexity and wildness of Nature becomes a specific object for aesthetic investigation, see: https://www.landscape.net.au/a-passion-for-perennials/.
Last access: 20.08.21

[10] In Philippe Rahm architectes. 2017. *Form follows climate: about a meteorological park in Taiwan*. OFL Lectures.

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BNA
DE TOEKOMST VAN DE STEDELIJKE RINGWEG
THE FUTURE OF THE URBAN RING ROAD
SNELWEG x STAD
HIGHWAY x CITY


BNA ONDERZOEK
BNA
Tien ontwerpvisies voor vijf locaties
Verbeelding voor een vierkante kilometer stad
DE STAD
THE CITY
VAN DE
OF THE
TOEKOMST
FUTURE
AMSTERDAM HAVEN-STAD
ROTTERDAM ALEXANDERKNOOP
DEN HAAG CENTRAL INNOVATION DISTRICT
UTRECHT STADRAND OOST
EINDHOVEN HELLENDORO


BNA ONDERZOEK
BNA
STAD X KLIMAAT
HET GEBOUW ALS WATERMACHINE
ONDERZOEK NAAR DE ROL VAN CORPORATIEWONINGEN IN DE KLIMAATADAPTATIEOPGAVE


HEEMSKERK
ALKMAAR NOORD
ALKMAAR
HEILOO
CASTRICUM
UITGEEST
ZAANDAM KOGERVELD
KOOG BLOEMWIJK
ZAANDAM
AMSTERDAM SLOTERDIJK
AMSTERDAM CENTRAAL
Vijftien ontwerpen voor Transit Oriented Development (TOD) aan de Zaan-corridor
ONDER WEG!
2014 2020 | 2035 | 2065
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NOTIONS FROM PRACTICE.

RESEARCH BY DESIGN AS A STEPPING STONE FOR THE IMPLEMENTATION OF INTEGRAL FORMS OF SPATIAL DESIGN —

Jutta Hinterleitner

Need for new forms of design

In the current era in which climate change combined with the continued growth of our cities poses major challenges, it is becoming increasingly clear that not only as designers, policymakers, administrators, but also as inhabitants and users of the city, we cannot continue as before. In addition to new forms of governance, the transitions we face as a society also emphatically demand other forms of spatial design. If we want to keep our cities and immediate living environment future-proof, safe and healthy, we will have to handle (public) space, mobility, raw materials and water more conscientiously, to name but a few examples. For architects and other design disciplines this means rethinking, designing and materialising differently, but also developing new roles, forms of collaboration and business models.

Practicing in design ateliers

Based on the fact that there is still much to be gained in the field of sustainable and integral design of the urban environment, between 2010 and 2021 BNA Research, the former research department of the Royal Institute of Dutch Architects (BNA) organized design ateliers in which architectural firms and other design agencies, problem holders and knowledge institutions take part. Throughout a design atelier the best possible future for an area was drawn up and discussed on the basis of equivalence (hierarchies did not apply) and in a setting where restrictions imposed by regulations and policies were set aside. This resulted in spatial translations, scenarios and designs, which show how various complex issues can be linked together in a design and which practical and policy-related steps can be taken to realize the outlined scenarios.

By using *research by design* at the front end of a process in which a vision for the future of an area is being created, it acquires strategic meaning. The images produced by the designers can help problem holders discover what ambitions they have for the future of a place or area. Combined with area-based knowledge and knowledge about the larger systems involved, this leads to useful quality frameworks for upcoming construction and development assignments, but above all to establish shared narratives.

The publications that discuss the results of the design ateliers: (1) Highway and City; (2) City of the Future; (3) City x climate. The building as a water machine; (4) Onder weg!.

By elaborating futures that are able to connect the various parties, a discourse coalition[1] can be created, an alliance around a shared story. In this way, high-profile design ateliers have been carried out in recent years, looking into, for example, opportunities for designing for transit oriented development[1] (de Boer, Van den Boomen et al. 2014), the role of the urban ring road as a place for transformation of space and mobility (de Boer, Van den Boomen et al. 2014) or opportunities for integrated urban development in times of major transitions (Berkers, de Boer et al. 2019).

Theoretical intermezzo — the literature behind the design atelier

The instrument 'design atelier' creates a learning network in which designers such as architects, urban planners and landscape architects work together with a broad palette of area stakeholders, governmental institutions and knowledge agencies. This is where what Varkki George (2007)[2] calls 'Second-order design' comes into being: design that creates strategic frameworks instead of final images, and that can adapt to changing circumstances. Gibbons et al. (1994)[3] describe the knowledge that underlies more open planning as 'Mode 2 knowledge': created in a transdisciplinary context, and more widely supported and applicable. Another key concept associated with this method of working is the 'soft space' (Allmendinger and Haughton 2007, Hajer 2017), an informal space for interaction and vision development, where stakeholders can collaborate on substantive rather than hierarchical grounds.

The practice: 'City x Climate — The building as a water machine'

From the autumn of 2019 til the spring of 2020, five interdisciplinary design teams, three municipalities and three housing corporations worked on the design atelier *City x Climate – The building as a water machine* under the leadership of BNA Research and Delft University of Technology (DIMI). The aim was to use design as an instrument to set up a learning network and together gain knowledge about possibilities for closing the water cycle in and around residential buildings.

The changing climate is forcing us to act, but the current visions on climate adaptation mainly focus on the function of public and green space as a buffer for extreme precipitation. But what if there is not enough storage capacity there? Because, for example, we have turned the urban public space into roads and parking lots, or, the groundwater level or soil conditions make infiltration impossible. The often-scarce public space is heavily overloaded. Almost all of the transition challenges the city is facing make a claim on public space and its subsurface: a puzzle that cannot be easily solved. Starting from the idea of reasoning from the building itself, and from the realisation that housing corporations have more than 2.2

[1] Daamen, T. A., and Verheul, W. J. 2014. "Stedelijke ontwikkeling als een emergente adaptieve strategie". *Bestuurswetenschappen*, 68: 3.

[2] George, R.V. 2007. "A Procedural Explanation for Contemporary Urban Design". In *Urban design reader*, edited by Tiesdell, Steve and Carmona, Matthew. Amsterdam; Boston; London: Architectural Press, Routledge.

[3] Gibbons, M., C. Limoges, H. Nowotny, S. Schwartzman, P. Scot, and M. Trow.1994. New Production of Knowledge: Dynamics of Science and Research in Contemporary Societies. SAGE Publications Ltd.

million homes under their care in the Netherlands, the design atelier focussed on the social housing stock. Investigating the building as a link in the water system, in which rainwater is not seen as a threat, but as an opportunity for climate resistance and comfort. The corporations, which were involved as partners in the project, can make a real difference as owners of an extensive real estate portfolio. Each of the five design teams settled at specific locations in the cities of Amsterdam, Rotterdam or Zwolle and used existing, outdated building blocks of the housing corporations as case studies. At all five locations, flooding during extreme rainfall was a problem. What possibilities did they see for making the buildings climate-proof? How could the water storage capacity of the buildings and their immediate surroundings be increased and heat stress reduced? Starting points in all five cases were peak loads of water due to extreme precipitation and heat stress in hot summers. How could a surplus of water be buffered before it could cause nuisance and then be used for dry or hot periods? And how could all this be designed to improve the quality of life of the inhabitants?

During the 5-month program, participants followed master classes at Delft University of Technology, worked on concrete plans with stakeholders in local workshops, and discussed interim results with each other. This led to lively discussions – for example, corporations and municipalities are far from knowing how to practically finance climate adaptation measures – and, to new insights.

The conclusion we can draw from this project is that the social housing stock can make a substantial contribution to climate adaptation, both in terms of coping with extreme precipitation and reducing heat stress. Cleverly using and linking technical and natural possibilities through design can mitigate the consequences of weather extremes. And what is most important in social housing construction: existing homes and neighborhoods can be improved. The design interventions proposed are not limited to the building alone. The larger water system of the street and neighborhood is part of the larger picture – and part of the solution.

This necessitates the involvement of many parties and cooperation between them. Cooperation, that in fact, is the only way to make the built environment truly climate-adaptive.

In addition to the climate adaptation, the design teams also integrated other issues such as local energy generation, reuse of building materials and social interaction into their plans.

Five design visions on climate-adaptive buildings

A phased climate adaptation plan was drawn up for the rowhouses in Tuindorp Oostzaan in Amsterdam North, where the buildings are being future-proofed in the rhythm of the maintenance cycle. The coming decades, private gardens will be transformed into a collective rain garden. On the street side when water levels are high, the street can take the role of a water buffer, closed off by front garden walls

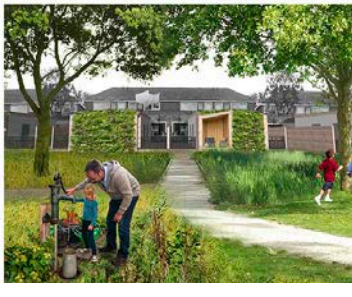
with watertight retaining walls. In exchange for giving up their private garden, the residents gain a pergola on the garden façade, which will provide shade and carry solar panels. At a later stage, the pergolas can be transformed into climate-proof extensions, with a grey water tank underneath.

The team that worked on the apartment building in the Waterlandplein neighborhood in Amsterdam North proposed to make a real water machine out of the four residential buildings and their immediate surroundings on the basis of technical and ecological measures. In feasible steps from small to large, the water problem and heat stress can be solved. The plan shows how the worn down flats can be upgraded with technical interventions and turned into attractive and liveable places. That begins simply, with a sloping roof that allows water to flow into tanks that facilitate the maintenance of greenery on the balconies and facades. With higher levels of ambition, the existing stairwells can be transformed into vertical gardens with galleries added for circulation. This makes it possible to differentiate the apartment types, while the water cycle is becoming more and more balanced.

Also in the low-rise Assendorp district in Zwolle a hybrid technical and ecological system is being proposed: a depth infiltration well collects all the water that falls in the closed building block into the ground for later use. On the way to the well, the precipitation waters the green roofs and fills grey water tanks for domestic use. These green roofs also eliminate heat, just like the summer night ventilation that is being added to the houses during planned maintenance. Here, too, the small private gardens will be transformed into a large, collective rain garden. This requires consent from the tenants, who





need to – above all – be seduced by the attractive result and the fact that the current water nuisance will be solved structurally.

Team Feijenoord worked on two city blocks on either side of a street and sought the solution for the water problem mainly in the sponge effect of vegetation. The petrified public and private outdoor space – the street and the gardens – will be used for the construction of a 'green blanket', which in dry periods will be fed by stored rainwater from underground infiltration crates and water tanks on the roofs. Fruit gardens will be planted to connect, cool and provide food for the residents. The roofs and façades will also be given a green skin, which provides cooling on hot days by evaporating the stored rainwater. In this plan, the green blanket will fulfil all the functions that are currently lacking: the water buffer, evaporative cooling and the meeting place.

In the Alexanderpolder in Rotterdam, where four gallery flats[4] were investigated, the most radical choice was made with a plan that allows water to step-by-step take over the neighborhood. The design team is committed to a large-scale transformation of the polder[5] landscape at more than six meters below sea level, which is subsiding. The measures the team proposes will create a swamp landscape and in the last stage possibly even a water landscape. The buildings become self-sufficient units that not only use the water from the surrounding area but also generate their own energy. Adding collective functions and meeting spaces in and on top of the flats create an attractive and interactive environment. Water is no longer presented as a threat, but as an opportunity for real estate and residents. For each of the test cases, an adaptive solution has been proposed, which can be scaled up as the need increases.

[4] A block with exits on interconnected balconies
[5] A low-lying tract of land that forms an artificial hydrological entity, enclosed by embankments.

The five design locations: Tuindorp Oostzaan (Amsterdam), Waterlandplein neighborhood (Amsterdam), Assendorp (Zwolle), Feijenoord (Rotterdam) and Het Lage Land/Prinsenland (Rotterdam). The top row shows the existing situation, the bottom row impressions from the design study

With regard to the business cases that have yet to be worked out: all parties realise that doing nothing in the long term will cost more than starting to deal with climate adaptation from here on. Both the participating design firms and the stakeholders have acquired a great deal of knowledge about climate adaptation in existing buildings. The housing corporations and municipalities have been presented tools for future implementation.

In addition, the results show that using *research by design* to develop scenarios for major transitions also helps to integrate new ways of thinking, working and collaborating into policies. The Dutch National Strategy on Spatial Planning and the Environment (NOVI 2020) published in 2020, recommends *research by design* as a working method, because it produces high quality visions.
What does this working method mean for the competences of designers? They need knowledge at the level of the larger systems to be able to make integral plans. Not only by organizing design ateliers, the BNA prepared its members for the strategic and connecting role that they can and must increasingly play. But also for architecture and urban design education, knowledge about transitions and systems is a crucial stepping-stone towards successful professional practice. Another obvious route to take is to establish integral studios in which students from different study programs work together on complex issues.
The knowledge and competences that can be achieved in multidisciplinary design ateliers definitely enable designers to make plans for a better and more liveable future of our cities.

Acknowledgment

At the time of writing the text contribution, the author was the Research Coordinator of the BNA. Currently, she is affiliated as Research Fellow Management in the Built Environment at the Faculty of Architecture and the Built Environment, TU Delft.

Notes

Design teams involved in *City x Climate*:

Tuindorp Oostzaan: Gerben Strikwerda, Bram van den Heuvel (Strikwerda van den Heuvel architects), Robbert Jongerius, Gijs Rijnbeek (LAND studio)

Waterlandplein neighbourhood: Tom Bergevoet, Maarten van Tuijl, Deniz Atakan, Sebastian Nitu (temp.architecture.urbanism), Erik Tober, Ruben Roelofs, Léon Brouwer, Chantal Posthouwer, Arend de Wilde, Marc Bijvoet (Royal HaskoningDHV).

Het Lage Land / Prinsenland: Nina Aalbers, Isabella Trabucco (Studio ArchitectuurMAKEN), Raquel van Donselaar, Menno van der Heijden (HOSPER landscape architecture and urbanism), Janneke van der Leer (SWECO), Fred Prins (GEP Rainwater).

Feijenoord: Dirk Jan van Wieringhen Borski (BNB Architects), Lieke de Jong (VISTA landscape architecture and urbanism), Gerard Wijland, Leon Valkenburg, Thijs Kool (Tauw).

Assendorp: Heleen Bothof (LUZ Architects), Arjen Oord, Olivier Hoes (Acacia Water), Esmeralda van Tuinen (independent public housing consultant), Michiel Brouwer (independent urban planning consultant), Remco Looman (lecturer/researcher sustainable indoor climate)

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The book 'Stad x klimaat – Het gebouw als watermachine' (in Dutch) can be ordered via www.bna.nl / shop.

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ACC. TEATRO LA SCALA
SERVIZIO BENI CULTURALI
TRAM LINEA 2
C. ARTISTISCO STATLE DI BRERA
DE AMICIS
ATTIVITÀ PRIVATE
+ S. LORENZO MAGGIORE
VETRA
ATTIVITÀ PRIVATE
SC. PARIT. IST. LEOPARDI
SC. PARIT. D'ANNUNZIO
TRAM LINEA

ACADEMIC RESEARCH IN THE ARENAS OF PRACTICE —

Laura Pogliani

Applied Planning Research as Usable Knowledge

The challenge of academic research in urban planning and design lies in exploring and experiencing new tools and finding a method of interacting with communities, forging ties among researchers, disciplines and real contexts. For scientists, it is a valuable opportunity to reflect not only on the importance of knowledge but also on the methods used to develop and carry it out.

On the one hand, the 'usable knowledge' (Lindblom and Cohen 1979) applied in social and governance processes is mainly an interdisciplinary knowledge, targeted at emerging problems in the public agenda and capable of generating new possibilities and opening new opportunities for collective choice. In this framework, the knowledge is not a prerequisite of the project, but it develops simultaneously with design guidelines. The progressively formulated hypotheses have an exploratory function. They arouse new questions and allow for in-depth analysis and verification to search for a reasonable balance, probably bound to be under discussion over time (Schön 1987, Palermo 2009). Knowledge and action are regarded as very compelling goals of the scientific research, in terms of i) understanding the main elements that define the relationship between territories and settlements, between nature and the human activities that transform it and ii) sharing the responsibility of shaping the fundamental choices of policy-making in the development of cities (Campos Venuti 2012).

On the other hand, knowledge contributes to a deeper level of reflection: «What is needed to progress planning knowledge: distance (reflection on practice) or involvement (reflecting with practice)?» (Balducci and Bertolini 2007, 533). The question arises inside and outside the University to demonstrate the broader relevance of local experience and the need for planning academics to be involved in the practice to test solutions in the real world. As planning is considered a social science and a social practice, putting scientific ideas into practice is vital for developing a more conscious and motivational attitude to real problems when interacting with several players, policies and public decision-makers. Additionally, this practical dimension enhances a collective understanding of urban practices (Castelnuovo and Cognetti 2013). It pushes research to propose tools and procedures that are at least partially repeatable and usable in other contexts. In other words, the relationship between a sphere of exploration and self-reflection, evaluation

Milano M4. Concept plan (DAStU, 2018) – The green dotted line is the metro route with the Vetra station. The white dotted lines are the new soft mobility lanes.

and refocusing of the researcher appears as an essential aspect of academic projects and a valid contribution of the University towards the city and the society.
Finally, as stated in the National Agency for Assessing Universities and Research (Anvur 2014), the third mission of an institution such as Universities is to encourage economic growth. Universities can achieve this goal by transforming the knowledge produced by research into learning which is useful within production and growing high-performance levels in activities related to culture, society, education or civil awareness.
The Department of Politecnico di Milano DAStU has for a long time been engaged in a public commitment towards practising knowledge and action with local governments and communities in different contexts. Some findings can help a better understanding of mutual gains.

Practices of Urban Design and Urban Planning in academic research and education

Academic research investigations have been recently practised in urban design and planning, combined with exciting educational programme innovations. In the urban design field, the case of the new metropolitan line no.4 is worth illustrating. The Milano Government asked DAStU[1], Politecnico di Milano, to provide its scientific and technical support to plan the site areas' surface arrangements for the new M4 stations. Supposedly simple, this request introduced a complex issue about the role of the new metro line in the city facing multiple, even conflictual, and largely still open decision-making processes. In this case, the researchers had the opportunity to outline a territorial scenario for the whole infrastructure to better understand its contribution in the interest of the local government, the operators and the city itself. The innovation of such research has been to propose a solution to conceive a multidimensional framework for urban regeneration actions at different scales named the Green and Blue Backbone (Fior, Vitillo, and Galuzzi 2019). Following this framework, the metro line's construction is matched with new superficial itineraries for slow mobility (cycling and pedestrian), to promote urban regeneration of parts of the city and to connect open green spaces and water networks on a local, urban and metropolitan scale. Slow mobility design follows the underground line on the surface and expands it, connecting the stations with important city sites (in the historical centre and outside). Besides this, careful urban design actions close to the new M4 metro stations allow exploration of broad connections, offer detailed design solutions, and, simultaneously, a deep study about the materials and design elements of contemporary city public space.
On a different scale, DAStU provided its scientific support in drawing up the new general urban plan for a medium-sized municipality (Rescaldina) in the Milanese metropolitan region[2].

[1] Research group: G. Pasqui (coordination); P. Beria, P. Galuzzi, F. Infussi, A. Longo, L. Montedoro, L. Pogliani, P. Pucci, P. Vitillo, with M. Fior, F. Oppimitti.

[2] Research group: A. Arcidiacono, L. Pogliani (coordination), with S. Ronchi.

In this case, the local administration intended to focus mainly on environmental protection. According to academic research linked to a new urban model based on open spaces and green infrastructure, the scientific support to local government tried to test a new approach for local planning (Arcidiacono et al. 2020).
At first, the researchers' role focused on constructing and sharing a joint strategy with the local administrators and citizens. The strategy included limiting land uptake, expanding and improving public services and facilities, adopting strategies to regenerate brownfield, unused and vacant land, enhancing the quality of green spaces, promoting the central role of small, local businesses in healthy communities, protecting the landscape and developing a 'green mobility' plan (including cycle and pedestrian tracks). Secondly, the scientific approach focused on ecosystems' performance to increase habitat quality and implement green infrastructure principles for strategically designing and managing ecosystem services in land use regulations.
Finally, the local Green Network design assumed a structural role in shaping the spatial strategies introduced, protecting landscape values and supporting land consumption mitigation measures. Similarly, it strongly oriented the implementation of the urban planning of public and private projects.
Concerning the educational programmes, in 2018 the School of Architecture, Urban Planning Construction Engineering (AUIC) at Politecnico di Milano decided to start an innovative collaboration with the municipal and metropolitan governments, following previous experience on similar issues, although more limited.
The aim was to find creative solutions to design a different urban landscape with a fresh and international approach and share it with local associations and cultural organisations. An educational programme named *Riformare periferie. Milano Metropolitana. (Re-shaping Peripheries. Milano Metropolitan City)*[3] interested studios, workshops and courses at different levels and was publicly illustrated on a website[4].
The programme and its outcomes have been illustrated on different occasions and finally in the Exhibition *Archives for Future* at Politecnico di Milano (Jan-Feb 2020).
Topics involved in all these activities concern the construction of public places for people, the reinforcement of new green corridors and the combination of uses, forms and resources for the city and its socially segregated areas. The aim is to achieve attractive, accessible, green, safe, multi-functional, socially inclusive, innovative and resilient spaces, starting from the renovation of the existing, complex, unsolved urban areas. So far, the programme has witnessed a civil and public commitment in the educational field without failing to take a critical look (Valente 2011, Orsini and Pogliani 2021). Accordingly, it tries to divert attention away from the big transformation projects, often achieved through speculative investments in the richer sectors of the city, and to focus on the

[3] Research group: I. Valente (scientific responsibility); F. Orsini, L. Pogliani (coordination), with G. Gualdrini, G. Meacci, F. Oppimitti, J.Ronchi.

[4] See: http://www.riformaremilano.it

renovation of the existing stock, based on investment in networks and services such as environmental goods and affordable housing. The three experiences mentioned briefly above explain some of the different interactions between the University and social actors. In the first case, academic research has a role in the enhancement of ongoing planning policies; in the second case, the scientific knowledge itself creates or contributes to building strategies and tools, while in the third case the educational programme innovates the approaches and produces new imaginative ways of dealing with problems. In general, the immersion in the field and a reflecting distance opens up the possibility of a critical contribution in knowledge and design.

Lessons learned

So far, DAStU has carried out several types of research supporting a practice that allows us further considerations, mainly concerning the appropriateness and usefulness of the academic research for the real world, its necessary selective attitude and its social awareness. Despite the contingencies and the various partners, the University can develop appropriate and useful knowledge to support local governments facing multiple contemporary challenges. The support can contend with the social, economic, technological, cultural and symbolic processes that define its performance in the educational field (Pasqui 2018). In this respect, a mutual benefit engages the research, the cultural, academic discourse and the social and political challenges to designing projects for improving the present conditions.

Consequently, it is crucial to adopt a selective approach and a critical attitude regarding the limits and reasons for otherwise indispensable practices (Palermo 2018). Applied research is not limited to providing pertinent answers to questions, but it also holds responsibility in constructing the problems in the social arenas. Finally, Politecnico di Milano has developed its capability to bring knowledge into practice in the local communities and at the same time to prepare students for more practical and social awareness. Regarding this last task, it is worth considering to what extent confidence and expertise in activating citizens' and students' participation in social processes can breathe new life into civic passion (Talia 2018).

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Viewpoints

MILAN AND ITS ECOLOGICAL TRANSITION DESIGN EMERGING PARADIGMS —

Cassandra Cozza

«The more deeply we study nature of time, the better we understand that duration means invention, creation of forms, continuous elaboration of the absolutely new».[1]

Life quality, safety, and liveability in cities are an issue for different disciplines: spatial, environmental and health, and social ones. Architects play an essential role in driving spatial changes in a given direction, trying to control the final quality of physical changes brought by projects, and processes. That is why the cities' growth or each future spatial transformation must be based on a vision that I have elsewhere called the *urban or higher-order paradigm* (Cozza 2017). *Id est*, the model that manages the city's functioning for a given historical period, until a mutation happens, and the existing internal form or organization ends to be effective (Cozza 2017). Each project should aim to take part in a broader transformation, taking into account, and tackling, the urgent challenges of a precise historical moment. Today climate change and pollution are a big issue, and cities must cope with it. Furthermore, the city's population has continuously grown, forcing the physical densification and bringing gentrification and social conflicts. How to turn the existing cities in safer, healthier and more liveable places through design actions? Which are the urgent challenges of the urban agenda? How do they impact open spaces, infrastructures and buildings? In this context, we can mean the project as the practice of scientific activity, conducted by a scientific community that shares paradigms or values (Amirante 2018); it is precisely based on this sharing that it is possible to express non-arbitrary judgments and recognize the methodologies on which the design process is built. In fact, the project should be a scientifically regulated product – which can be produced in the didactic, research or professional field – nevertheless, it is always difficult to evaluate and convey it. The paradigm, meant in the sense conferred to it by the sciences' philosophy, indicates «that complex of methodological rules, explanatory models, criteria for solving problems that characterize a community of scientists in a specific phase of the historical evolution of their discipline».[2] The identification of theoretical interpretative tools, such as different kind of paradigms[3], allows us to understand and guide the transformations at the various scales so that we can intentionally direct the project through them. As designers, we are called to understand the transformative value of each intervention – be it to small, medium or large scale – to propose responsible design actions. The aim is, therefore, to experiment new emerging design models that take into account urban metabolism (Wolman 1965) and pay attention to energy and performance and the overall

spatial quality and liveability, including systems of local identity and multiple relationships, uses, open and built-up spaces with their formal, iconic and cultural contents. In this way, design methodologies of the project, and their aims are established starting from the role of each place, project or transformation within a more extensive system.
According to Thomas S. Kuhn (Kuhn 1969), scientific evolution does not follow a linear course, but it is based on paradigmatic changes. When one of these changes happens, it directly impacts the choice to the problems to be solved in that historical period; priorities change, and scientists start to look in new directions. Which changes are the most urgent for our cities? How do we choose what to do, and where? How do we shape a new vision of an existing city? Infrastructures, open spaces, and buildings are the main fields to put in act the desirable changes with innovative design actions and techniques. Abandoned, underused, and misused buildings and spaces leave room for testing new design approaches and methods. The goal is to regenerate and innovate parts of the city and at the same time, to improve it all.

Changes happened in the last decades to the City of Milan have offered room to host past and future transformation in plots located in the city that have become more and more central and strategic across years, representing a considerable potentiality for broader city changes. According to the magazine *Sole 24 Ore* – that surveys the quality of life in Italian cities[4] based on 90 indicators – Milan had moved from the 39th position of 1990 to the 1st of 2019 showing a significant improvement of its quality. Climate changes adaptation, (water management, heat bubble, etc.), air pollution mitigation, land consumption reduction and gentrification are the main issues for the future public agenda that, at the same time, is working on attractiveness, infrastructure, and major urban functions. Main design actions that took part to this improvement are: nets of green spaces strengthening and connection; number and quality of green and public spaces improvement; significant asphalted areas de-pavement/ desealing; new trees plantation and biodiversity improvement; big projects of urban regeneration based on new districts with a contemporary architectural identity that connect the existing area with public spaces.
Suchlike other European cities, Milan have faced a process of de-industrializations that has left behind many abandoned sites and buildings; moreover, infrastructural development have created marginal empty plots, and wide underused railyards became available. Areas that play an essential role in hosting new projects of urban regeneration and that reshape the public space and improve the city's quality. Different design action levels have happened, due to the different dimension, location, and character of each area and plot: transformations, substitutions, re-use and adaptative re-use, maintenance, restoration, and so on.
Nevertheless, many places are still left abandoned or in a state of decay. Since 2014 Municipality of Milan has mapped them; buildings or areas considered to cause a danger to safety, healthiness, and public safety – or to discomfort the urban decorum and quality – have been reported in a specific chart[5]. In order to solve the bad impact that those buildings and places generated both on neighbourhoods and dwellers, the Municipality has established in the *PGT*

Parco Segantini – former seat of the pharmaceutical industry Istituto Sieroterapico Milanese, closed in 1993 – is a park of 10 hectares opened in 2010s due to the synergy between the Municipality and the Associazione Parco Segantini, an NGO of inhabitants that plays an important role in its maintenance and organisation promoting many activities that include shared edible gardens, environmental monitoring, ecological and biodiversity improvement. The park is an interesting example of urban regeneration capable of creating social, environmental and economic value. It is born on an abandoned area after the reclamation of both water and soil; the project, developed by the Green and Agriculture department of the Municipality of Milan, is based on a concept of the landscape architect Michele Desvigne. Some historical buildings have been re-used, new housings built along the edge, and the open area is organised in different parts, including the Bonifati Roggia – a creek that is a fine intervention of environmental recovery and biodiversity valorisation – a bamboo forest, a big central clearing, playgrounds, the horticultural gardens and seasonal flowering meadows. Parco Segantini is part of the Green ray number 6, one of the eight green routs that will connect the metropolitan green belt park to the city centre. (photo: C. Cozza)

A detail of the bamboo forest in Parco Segantini.
(photo: C. Cozza)

Parco Segantini, a detail of the Bonifati Roggia creek.
(photo: C. Cozza)

Milan 2030 that the owners must start recovery or demolition within 18 months from the plan approval; otherwise, they will lose the right to build the same amount of existing square meters, and they will be allowed to build 0,35 square meters per plot square meter only.
The main goal was to accelerate the urban transformation and to avoid the persistence of urban decay states.
Today we observe the result of long process best practices – started from the '70s – that have brought to the ecological, spatial and social rehabilitation of abandoned industrial areas and quarries turned into vast public parks suchlike *Parco Nord, Parco delle Cave*, and *Bosco in città* as well as former industrial sites recovery, new urban parks, and new districts development all over the city.
Politecnico di Milano – *Architecture Urban planning Construction Engineering School* has promoted a didactic programme to attract interest and train students to the topic of abandonment and decay of building and places called *Re-forming Milan* (2014-2016) that promoted many different events and a publication (Coppetti and Cozza 2017).
Città metropolitana di Milano is partner of *Nature 4 Cities*[6], an H2020 EU-funded project, creating a comprehensive reference Platform for Nature-Based Solutions that offers technical solutions, methods and tools to empower urban planning decision making. 'Re-naturing cities' through NBSs is an important point promoted by EC 'Research and innovation policy agenda' that aims at 'Innovating with nature', bringing nature back into cities and improving the use of nature in buildings and open spaces.
The research *Nature 4 Cities* has collected a comprehensive database of existing Nature Base Solutions[7], I am reporting here a selection of topics to address the main urban challenges that we are facing:
(1) Strategies and actions – urban (green) spaces management: urban planning strategies (ensure continuity with an ecological network; take into account the distribution of public green spaces through the city; planning tools to control urban expansion);
(2) Object, shapes and physical projects – on the ground: parks and gardens, urban network structures (grass tram tracks, street trees, green strips, unsealed car parks, green parking lot), structures characterized by food and resources production, ecological restoration (quarry restoration, management of polluted areas by plants – phytoremediation), choice of plants;
(3) Object, shapes and physical projects – on building structures: green roofs (intensive, semi-intensive, and extensive green roofs; roof ponds); green walls (climber green walls, green wall system, planter green wall).
Infrastructures and public transport have been enhanced and are strategic for a future improvement: Milan has a net of airports, high speed and local railways, metro lines, highways, water channels and bicycle lanes. Public green spaces through the city have been changed a lot and different urban scale significant improvement are expected by the forecasts of *PGT Milan 2030* that is planning 20 new parks, a new Metropolitan park green belt that will create a network of parks, a lot of new trees and sustainable improvements of building and places by setting carbon-neutral goals and encouraging the realization of permeable areas, green roofs, trees plantation, and many other CO_2 reduction design actions.
Important future goals for the city are: to change 'peripheries' into

'neighbourhoods' by improving their quality and services; to improve infrastructures and bicycle lanes; to provide affordable housings; to improve the city quality for dwellers and families. Milan is part of the *C40 cities*[8] and has joined the *C40 Reinventing cities*[9] competition since 2018 providing innovative and sustainable approaches for new architectures. In any case, design action at the scale of the single building improvement, or on the open spaces, are better defined than design actions at the urban and architectural scale. We need more public experimental projects and research to set urban and architectural design actions to tackle future challenges.

Notes

[1] Bergson Henri, L'évolution créatrice, Félix Alcan, Paris 1914.

[2] «Con altro sign., il termine è stato recentemente introdotto nella sociologia e filosofia della scienza per indicare quel complesso di regole metodologiche, modelli esplicativi, criterî di soluzione di problemi che caratterizza una comunità di scienziati in una fase determinata dell'evoluzione storica della loro disciplina: a mutamenti di paradigma sarebbero in tal senso riconducibili le cosiddette "rivoluzioni scientifiche"». Translation by the author. http://www.treccani.it/vocabolario/paradigma/ (last access: 04.04.20)

[3] Elsewhere (Cozza 2017), I proposed using four different types of paradigms – urban or higher-order paradigm, spatial paradigm, design paradigm and syntactic paradigm – as tools for deciphering the value of a place and its transformation at different scales. Within a desired urban paradigm, each place to be transformed is located in a specific spatial paradigm with given physical, morphological and environmental characteristics; it has specific transformative properties potential, relationship systems and limits. The project proposes a design paradigm that architects interpret according to personal syntactic paradigms.

[4] https://lab24.ilsole24ore.com/qualita-della-vita/

[5] R.10 Carta del consumo di suolo and https://geoportale.comune.milano.it/MapViewerApplication/Map/App?config=/MapViewerApplication/Map/Config4App/405&id=ags

[6] https://www.nature4cities.eu/

[7] https://geocluster4nbs.nature4cities-platform.eu/#/nbs

[8] https://www.c40.org/

[9] https://www.c40reinventingcities.org/en/sites/sites-in-competition/filter-milan/

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ADAPTATION TO CLIMATE CHANGE IN GREECE: THE ROLE OF THE LIFE IP ADAPTINGR PROGRAMME —

Miltiades S. Lazoglou

INTRODUCTION

Climate change has been acknowledged as the most important and most critical challenge humanity faces. Recognising the criticality of the issue, the European Union (EU) was mobilised to enhance the adaptation of its Members-States to climate change. A significant role in the EU's tools is played by the LIFE Programme.

Greece currently does not possess the data, assessment mechanisms, decision-making structures, and implementation culture to effectively manage and protect, vulnerable sectors, such as its landscapes and cultural heritage from the effects of climate change.

To address these challenges, a LIFE Integrated Project (IP), called 'AdaptInGR-Boosting the implementation of adaptation policy across Greece' was approved for Greece. The programme aims to support the implementation of adaptation policy in Greece with appropriate actions at the national, regional and local level.

CLIMATE CHANGE ADAPTATION IN GREECE

In April 2013, the EU endorsed a strategy on adapting to climate change (COM 2013-216) to encourage Member-States to ensure that policy-making is based on comprehensive data and information.The Greek National Climate Change Adaptation Strategy (NCCAS) was adopted in mid-2016 (L. 4414/2016) along with the establishment of a National Council on Climate Change Adaptation. The main objectives of the NCCAS are to estimate the immediate and long-term expected impacts of climate change on the Greek territory based on vulnerability assessment analysis; identify the priority areas that need climate change adaptation measures to be taken, and to outline the measures requiring legislation to ensure the adaptation to climate change is effective. These objectives are thoroughly analysed through Regional Climate Change Adaptation Strategies (RAAPs).

LIFE IP ADAPTINGR: A BRIEF OVERVIEW

The LIFE-IP AdaptInGR programme (https://www.adaptivegreece.gr/en-us/) is led by the Greek Ministry of Environment and Energy and is delivered in cooperation with strategic partners from the central administration, local and regional governments, academic institutions and non-governmental organisations such as the ELLINIKI ETAIRIA-Society for the Environment & Cultural Heritage (ELLET). The programme's duration is eight years (2019-2026), and its overall budget is €14.2 million.

Its overall goal is to support the implementation of the national adaptation strategy in Greece. Among its actions (Diagram 1), of particular importance are assessing the efficacy of

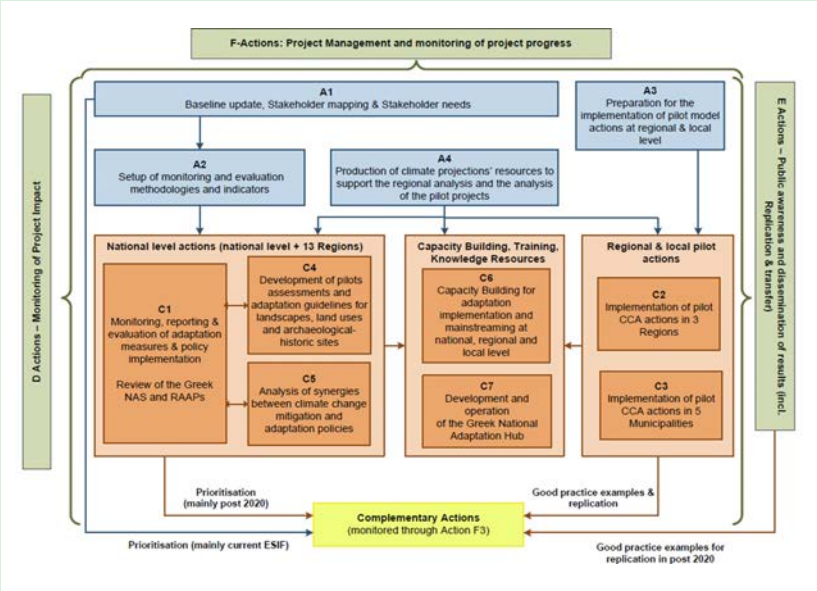


Diagram 1: LIFE-IP AdaptInGr actions.

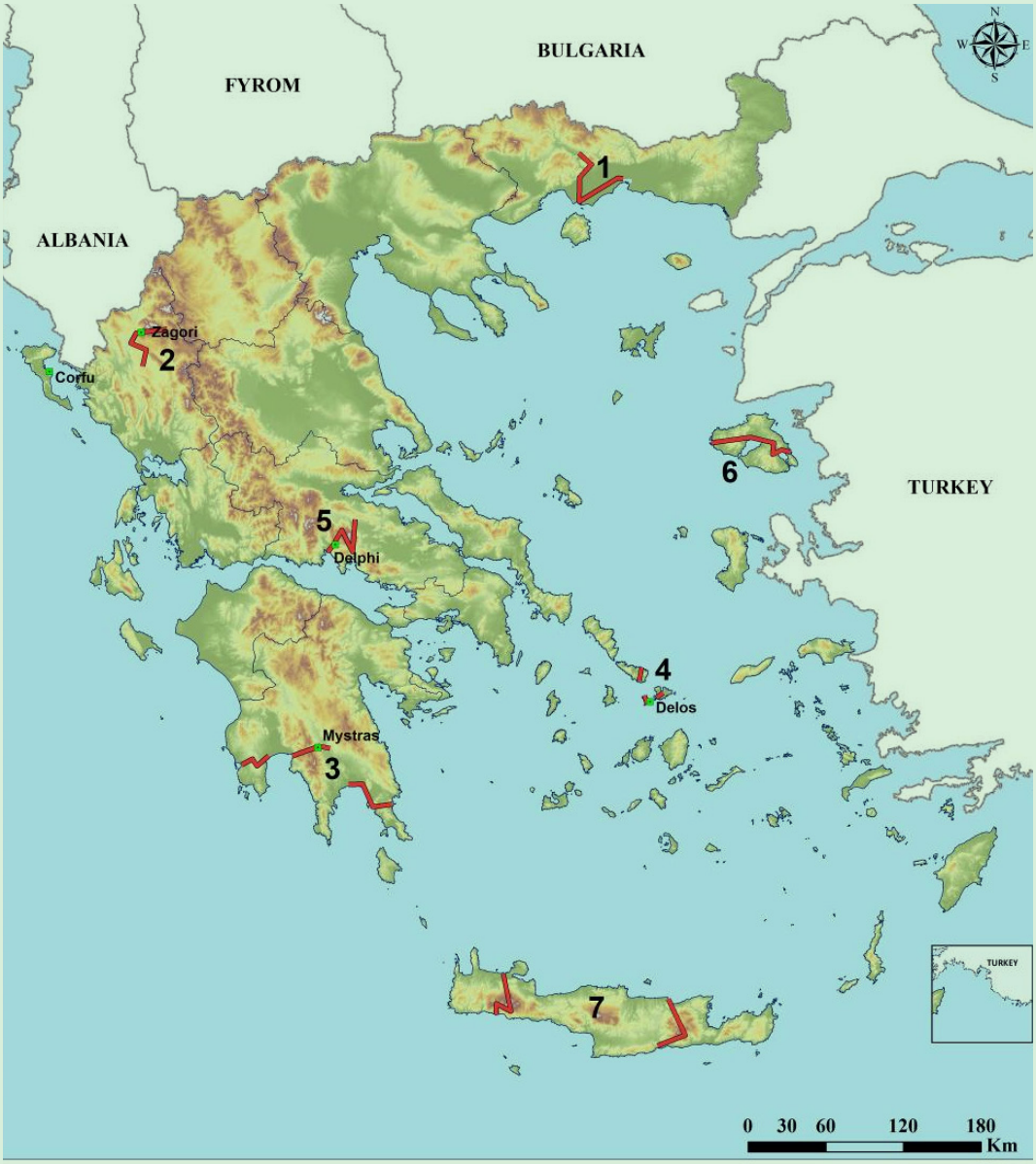
the NCCAS and RAAPs and suggesting improvements in what concerns the adaptation of landscapes and cultural heritage to climate change. These are the main responsibilities of ELLET in the LIFE-IP AdaptInGR Programme.

ADAPTATION OF GREEK LANDSCAPE TO CLIMATE CHANGE

Greece currently does not possess the data, assessment mechanisms, decision-making structures, and implementation culture to effectively manage and protect its landscapes from the effects of climate change.
To address these challenges, a toolkit for recording and managing landscape will be developed through the Life-IP AdaptInGr Programme. This will be achieved by modelling the effects of climate change and proposed adaptation measures for nine study-areas.
In order to perform a meaningful and informed analysis of the study-areas, the method of transects will be used. Landscapes will be recorded along narrow sections at a linear resolution of 500m, covering from the closest mountaintop to the sea or river basin, so that the sub-components of the landscape, which tend to vary with altitude, can be included. Along each transect, the CORINE land cover will be the primary dataset, while on-site and satellite photo observation will be used for the refined recording of existing landscape typologies. Moreover, national climate datasets, downscaled to a resolution of 3 square km will be used.
After the cycle of the nine study-areas has been completed, the overall guidelines for landscape adaptation at the national level will be developed.

CULTURAL HERITAGE AND CLIMATE CHANGE ADAPTATION IN GREECE

The Life-IP AdaptInGr Programme will assess whether the measures proposed in the NCCAS and RAAPs successfully address climate change impacts and



LEGEND

Archaeological sites

Case studies on landscapes and land use

1. Nestos (Stavroupoli – Keramoti) - Avdira – Vistonida transect (73km)
2. Ioannina – Zagoria transect (39km)
3. Pylos - Anc. Messini – Taygetos – Mystras – Sparta and Elos– Monemvasia transects (104km)
4. Delos – Rinia – Tinos transect (19km)
5. Itea– Delphi – Mt. Parnassos transect (28km)
6. Mitilini – Kalloni – Sigri transect (52km)
7. Chania – White Mountains – Samaria Gorge and Chersonissos- Dikti – Anapodiaris transects (85 km)

Map: Locations for the project's study-areas on landscapes and on historical and archaeological sites.

adaptation policies for historical and archaeological sites and propose overall methodologies and measures for their adaptation. Given the complex and diverse nature of climatic change impacts, as well as the varied range of archaeological and historical sites throughout Greece, five monuments/ historical sites will be studied, which will act as stepping stones on which a baseline methodology will be formed, and a strategic plan will be shaped. For each study-area, a multidisciplinary team will assess the impacts of climate change and propose adaptive measures. More specifically, the following steps will be followed:
(a) Assessment of the values and significance of each site.
(b) Understanding of the relevant indicators and the vulnerabilities of each site.
(c) Establishment of indicators for the vulnerability elements and actual assessment of vulnerabilities.
(d) Establishment of adaptive capacity in respect of vulnerability -i.e. proposal and assessment of adaptive measures with respect to the significance of each site.
(e) Following all the above, a danger classification will be established, and a cost-benefit analysis will be calculated as well.
After the cycle of the five study-areas has been completed the overall guidelines for historical and archaeological sites adaptation at the national level will be developed.

CONCLUSIONS

In Greece, there is still the urgent need to (a) Build the capacity of public authorities mandated to plan and deliver adaptation actions and policies, (b) Create an effective mechanism to monitor, evaluate and update adaptation actions and policies, (c) Raise public and stakeholder awareness of climate change adaptation, (d) Mobilise complementary European and national funding and other financial sources to implement adaptation policies, (e) Disseminate good practice examples across Greece, the Eastern Mediterranean and the EU. These are among the goals of the already approved Life-IP AdaptInGr Programme. Further, this programme will provide the necessary resources to assess the first evidence of implications of climate change impacts regarding landscapes/ land-uses and historical/archaeological sites and will also propose appropriate measures to ensure their effective adaptation to climate change.

ACKNOWLEDGEMENTS

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MAKING OUR GREEK CITIES ATTRACTIVE AND SUSTAINABLE. A LANDSCAPE DESIGN POLICY APPROACH —

Aikaterini Gkoltsiou

Urban environments influence the lives of millions of people and nowadays more than ever, they need to be sustainable, healthy, attractive and vibrant. Over the last 50 years, European cities have seen dramatic improvements in terms of mobility, green areas and waste management, and this has contributed to a significant improvement in living standards (EU 2010). In Greece, there is a growing consensus that cities should gain more green spaces and to be climatic resilient. Both Athens and Thessaloniki, in their resilient strategies offers a set of new integrated ways to prepare and protect their most vulnerable from future shocks and stresses that the city will face (City of Athens 2016, City of Thessaloniki 2017).

The Panhellenic Association of Landscape Architects (PHALA) is the voice of the profession in Greece and an advocate for its members on issues such as urban renewal, sustainable development and cultural heritage. Landscape Architects in Greece takes a holistic approach towards the creation of human environments and sustainable natural ecosystems and special places. Being the only association of landscape architecture, that can formally represent Greece abroad, PHALA participates in international IFLA and IFLA EUROPE meetings as well as in working groups with other landscape architecture associations abroad. Among PHALA's objectives are to sensitize public authorities and people on landscape architecture, sustainability, improving the quality of life and responding to the requests of National and International Organizations to address environmental and humanitarian crises in relation to the landscape. Therefore, the Association collaborates with public and private bodies on issues related to the promotion and protection of the landscape and the environment.

In 2019, PHALA was responding to current climatic and social challenges, and presenting its position statement to the Greek Parliament about 'Urban green infrastructure. Proposals, Interventions and Policies'. The proposals about new policies regarding better cities were based on the key elements of the E.U. approach to the urban environment such as are the Thematic Strategy on the Urban Environment, the Leipzig Charter on Sustainable European Cities, the Sustainable Development Strategy for the EU, the Lisbon Strategy and The Europe 2020 Strategy. The core principles were about policies which will promote a holistic planning, address environmental justice and racial and social equity issues and address broader regional goals and issues as well as local and site-specific concerns. A holistic landscape design should promote nature-based solutions, seeking to engage society in the protection and enhancement of the ecosystems. This is why, in

collaboration with the International Federation of Landscape Architects, PHALA promotes nature-based solutions, conserve and enhance natural assets. More precisely, regarding the green infrastructure, it is very important any design and planning solution to prioritize the retention and expansion of green spaces and especially the tree planting, enhance the biodiversity and incentivize healthy soil management practices (ASLA 2018). Green infrastructure should be incorporated to all transportation projects. Electrical vehicles should be promoted, as well other technologies that support connected and autonomous vehicles.

Greek landscape architects are prone to design green roofs and green spaces, to reduce paved areas, to use water permeable materials and to maximize the integration of trees and vegetation supported by healthy soils. To this end, PHALA was launching a series of visits to the most well know parks and green infrastructure areas of big cities, focused on collective efforts to increase the opportunities for all people to experience nature, and to grow public support for conservation.

Based on the above and in order to strengthen the cultural identity of green spaces, such as historic gardens and parks, PHALA is working form 2018, on an inventory of historic gardens, parks and landscapes from all over Greece. Their acknowledgement, protection, conservation and orthological management is essential for the continuity of designed landscapes acting as collective memory safekeepers. Mitigation and adaptation to climate change measures within design and planning projects are also very important (The Landscape Institute 2008). There is a need to promote water conservation and water reuse technologies as well as to adopt a national water strategy and a new 'culture of water'.

Nowadays many techniques are invented to capture rainfall and release it back to the landscape. Landscape architects aim to use in their design several techniques, which form an ideal stormwater chain (rain barrels, storm water planters, rain gardens, permeable pavements, etc.). These can be easily integrated into typical residential and public or commercial landscapes. Similarly, many solutions can be used to contrast water scarcity such as submerged flow-phytodepuration stystems, surface flow- phytodepuration systems, lagooning, xeriscaping, choice of low irrigation species, efficient irrigation techniques and technologies, etc. The most well-known public project, example of xeriscaping, in Athens is the Mediterranean Gardens at Stavros Niarchos Park.

Regarding the above, PHALA propose that policies should be based on incentives, either through funding for green infrastructure, or through restructuring of insurance programs, etc. This is why, policies should be regularly evaluated in terms of performance measures and reviewed for unforeseen consequences. It is essential to include performance measures with clearly defined measurable elements and benchmarks. To achieve sustainability goals, policies must be developed based on landscape ecology and in combination with science and national-regional planning.

Last but not least, special care should be given to the social aspect of our urban environment and protect our vulnerable communities who are less active in their decision-making. For this reason, policy planning and

implementation should include elements that benefit the whole community. In 2016, the Panhellenic Association of Landscape Architects, decided to revitalize the history and memory of the ancient Olive grove of Athens, by landscape designing in a volunteer basis the Elaionas Refugee Camp. Among PHALA's main goals were to improve the living conditions of the refugees, to restore the particular area of the Ancient Olive Grove, to sensitize public opinion towards the refugee and immigration problems and to promote the social and philanthropic role of landscape architects worldwide. This symbolic gesture aimed to reveal traces of memory of the ancient olive grove and history of the place, as well as through the effective temporal constructions for shade and protection from the sun and rain, to involve the community. Effective citizen engagement is critical to developing and implementing appropriate and effective resilience strategies and policies. Landscape architects in Greece, can play an integral role in the conservation of Greek landscape and environment, as long as they work to accommodate both the needs of human society and the natural environment, respecting the cultural landscapes of the past and planning sustainability for the future. There is a need for more resilient and climate smart communities and our challenge as designers and professionals is to put the above approaches into practice as standard operating procedure for all types of development.

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Special Tour to Stavros Niarchos Park. PHALA initiative: ‘Landscape Architects guide you to prominent landscape project’, 2017. (photo: A. Gkoltsiou)

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Water channel and xeriscaping plants, as examples of water saving solutions. (photo: A. Gkoltsiou)

Didactic Experimentation

The last section presents a plural curriculum of didactic experiences in architecture and urban design from four different academies and educational programs in Politecnico di Milano, Delft University of Technology, Warsaw University of Technology, National Technical University of Athens.
These are final theses or design studio results from the last years of Master's courses, directly addressing issues related to design transition within urban and metropolitan European contexts. The works offer diverse points of view and approaches that revolve around some central questions, almost as shared echos in the presentation texts of the proposals. Resilience, circular economy, and social inclusion have been the main chances of redefining sustainable growth through design tackling different site conditions. Some proposals address problems and conflicts in the marginal areas of contemporary metropolises, such as London or Milan, or, on the contrary, central areas that suffer an overplus of functions and programs. In a more general perspective on the urban condition, these contexts have been identified as fragmented landscapes of urbanization in search of alternative design rewritings and opportunities. Through regenerative design actions, the sites become green margins, accessible urban and public nodes reusing or implementing their infrastructural values, new frames for sustainable mobility able to bond and overlap natural landscape elements with new economic impetus. They manifest a straightforward inquiry for different futures to test a possible ecological rebalancing *vis-a-vis* more sustainable urban conditions.

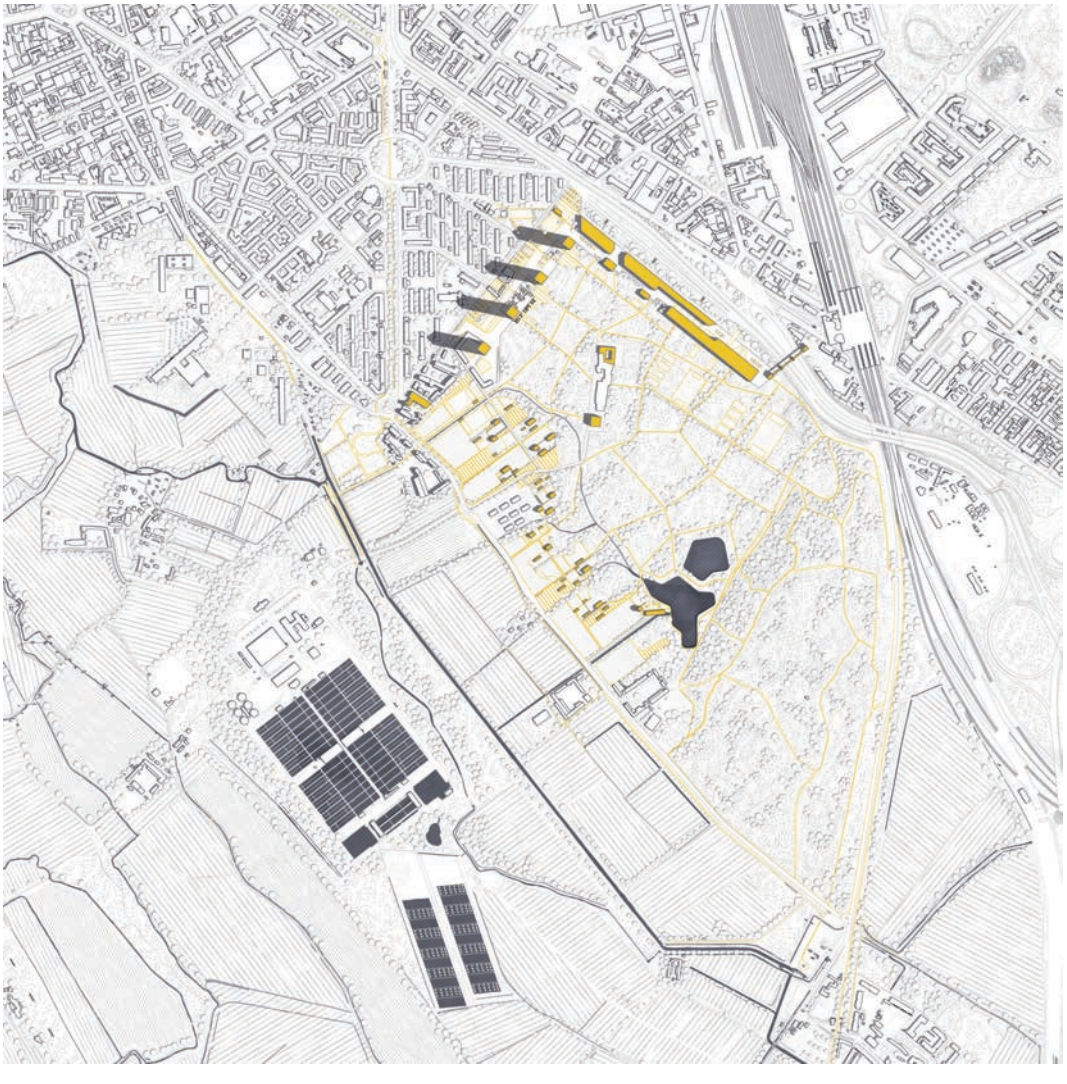
CITY SIDES. RE-THINKING PORTO DI MARE THROUGH DESIGN STRATEGIES OF CIRCULAR ECONOMY AND RESILIENCE —

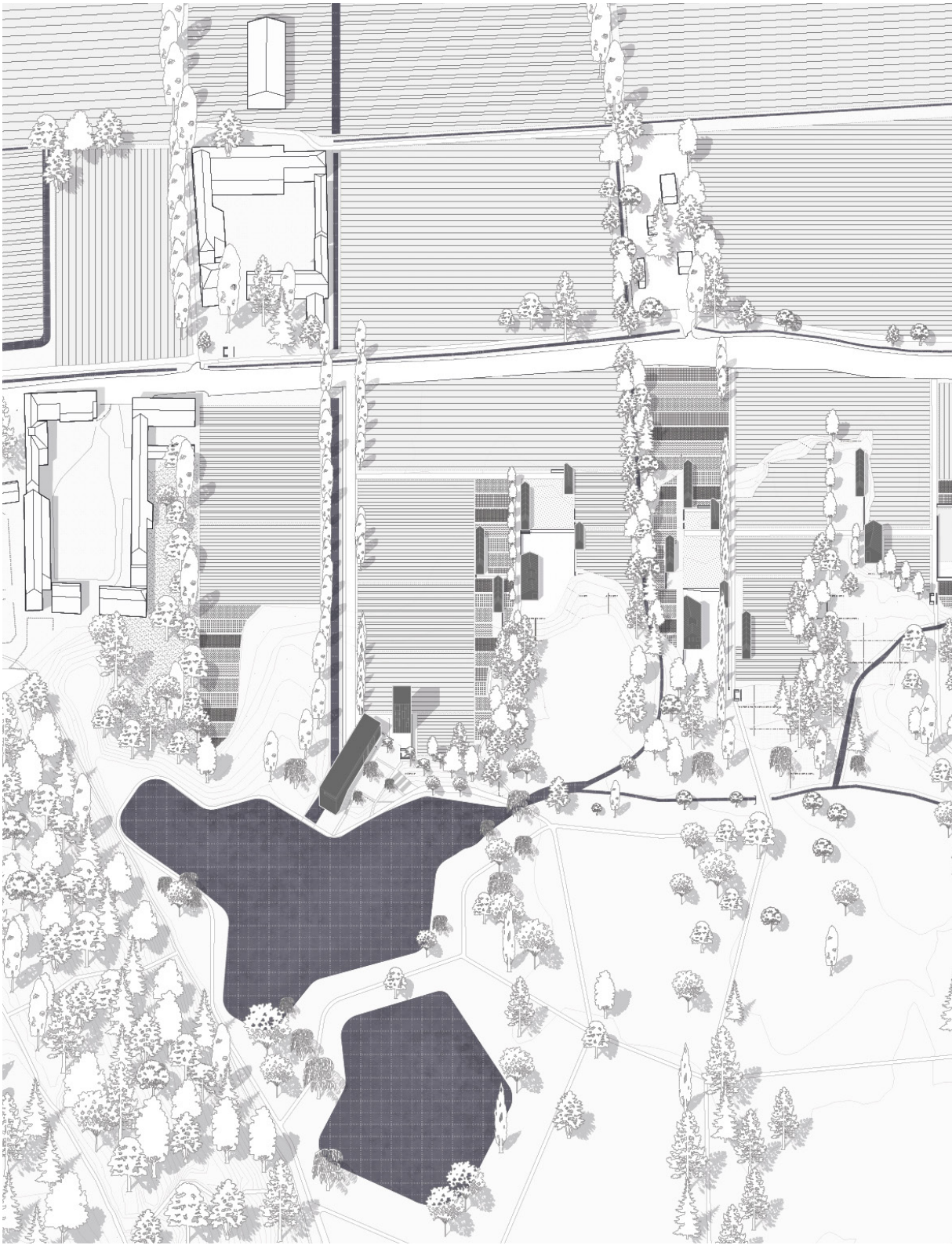
Kevin Santus, Stefano Sartorio, Arianna Scaioli
Master Thesis, Politecnico di Milano

The thesis critically engages the city of Milan, whose character is defined by phenomena of fragility. The research, applied to the area of Porto di Mare in the south-eastern part of Milan, aims to redefine the urban border, rethinking a part of the city and identifying a set of strategies defining a resilient framework able to face environmental and social issues. Rethinking the city's border has meant acting within a fragile territory, where feeble signs coexist with stratified and consolidated territory traces. Following the analytical part, we revised the 'Ciam grid' intersecting three scales of intervention with the themes related to the city of the future to define a set of operations to answer this request. These are assumed as fundamentals for the definition of a Masterplan which follows the paradigms of resilience and Circular Economy: reduce-reuse-recycle. The project is developed through different temporal phases, allowing a circular construction chain. Moreover, the energetic sustainability was accomplished by integrating a Smart Grid and clean local energy production.
The first scale is the 'Territory' that deals with the regeneration of a disused railway through the reactivation of a local network. This linear system interacts with the territory by connecting with relevant nodes, converging on Rogoredo station, a new hub between the urban and the territory, crucial for the future city. Furthermore, this intervention defines a new relationship between citizens and landscape, preserving it while giving new value through integrating ecological corridors and promoting biodiversity.
The scale of the 'Settlement' declines urban design with the new food policies, where the local production chain, in relationship with food processing and advertising, becomes a vital factor in reactivating the city's metabolism. These new food policies are integrated with the project to face the current food emergency. The strategy is declined through temporal phases starting from the reclamation of the land, then by identifying buildings that could be reused and areas to stock recycled materials derived from the selective demolition; the aim is to define a sustainable ecosystemic intervention.
The 'Architecture' deals with two different projects assuming the resilience and circular economy paradigms, considered a chance to redefine sustainable growth, with the reducing soil consumption and the restitution of land as valuable factors. The architectural design and technological aspects should interact to introduce elements of future modification inside the project, i.e. dry construction that allows the reuse of materials and a sustainable construction chain. Resilience is intended in its social connotation by creating shared spaces and public spaces for social cohesion at the city level. The environmental value is given through the design of draining spaces.
In conclusion, the three analysed scales focus on how architecture can answer climate change issues and develop a sustainable circular approach to rethinking and regenerating fragile areas within the urban scenario.

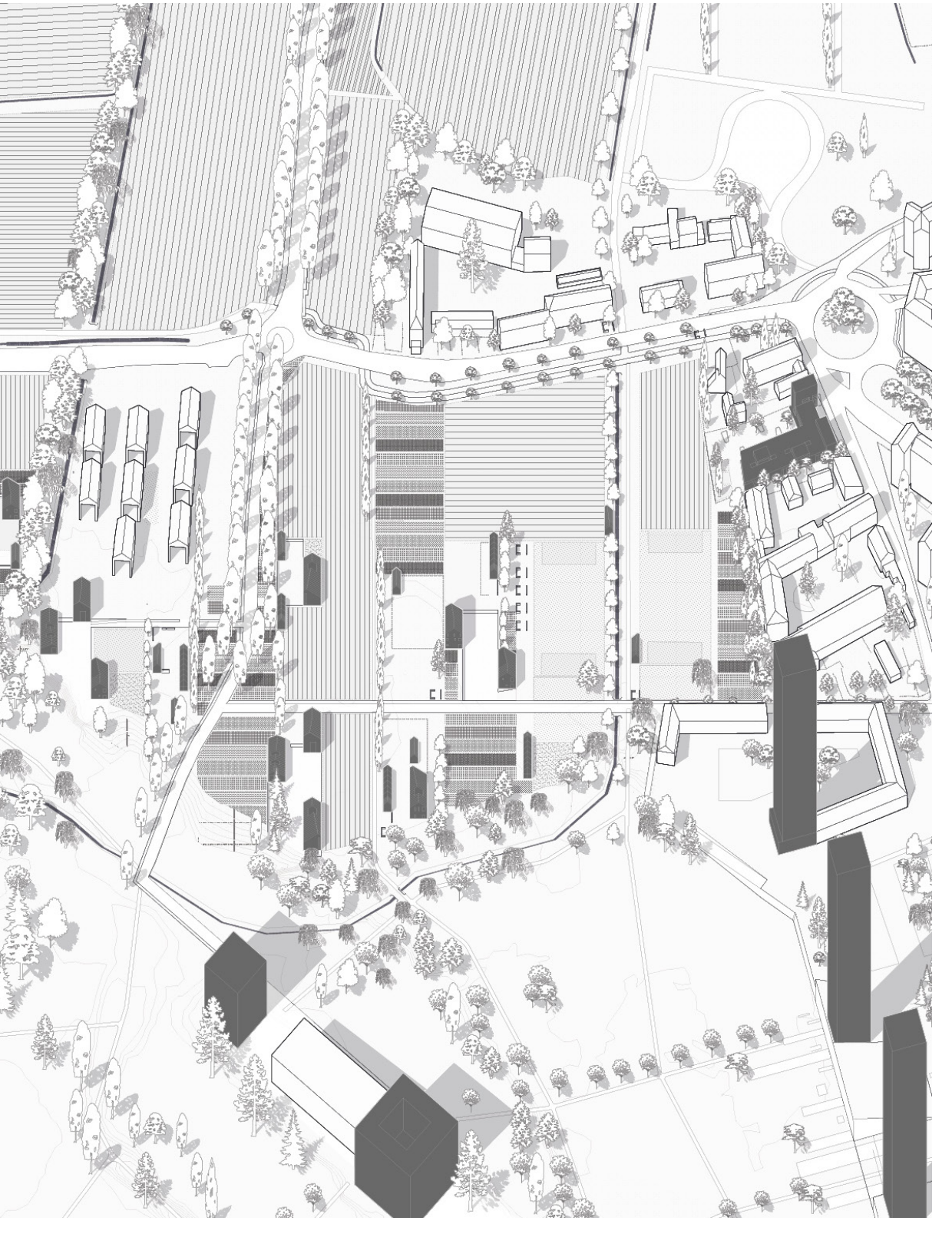
Geography of Modification – Definition of a border open to be modify, within which it is possible to identify fragile areas, chance for new developments.

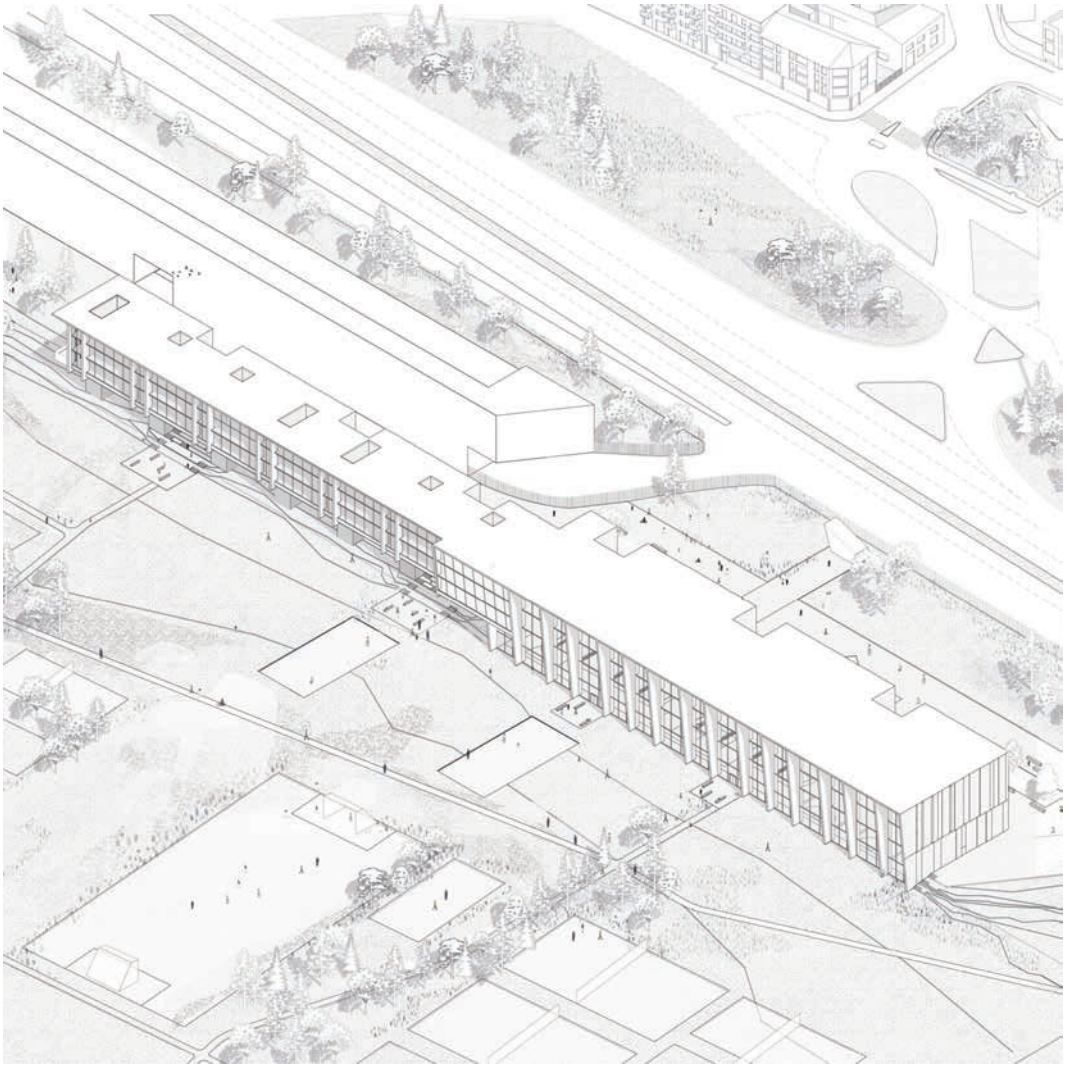
Masterplan – Definition of a strategy to regenerate a marginal area.

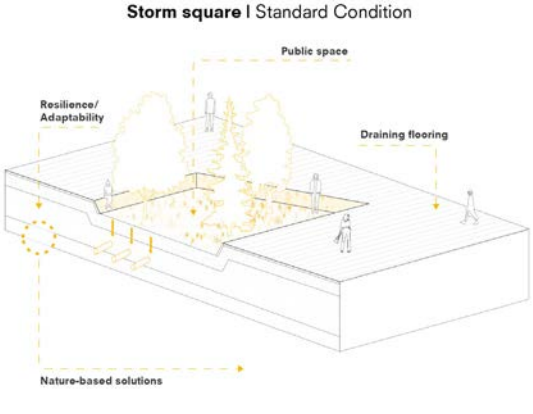


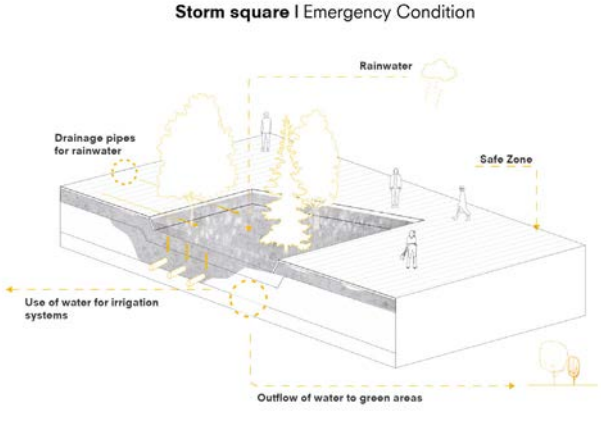


↑ **Rural Urbanity** – Settlement scale. Definition of a spatialized foodpolicy, to create a resilient landscape to preserve the agricultural vocation of the site.



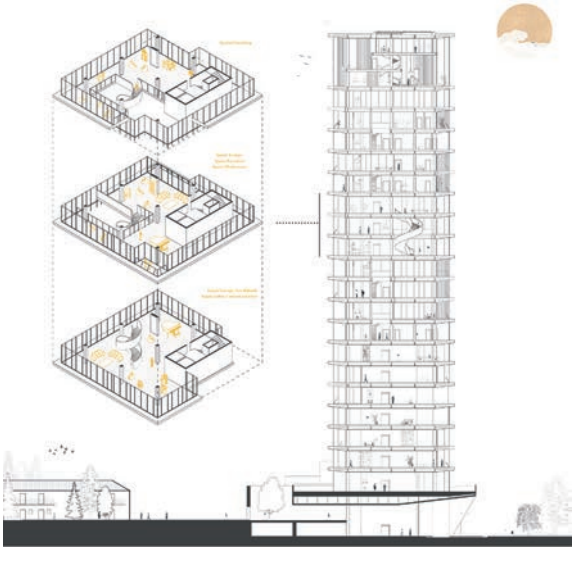



Storm square I Standard Condition
Public space
Resilience/
Adaptability
Draining flooring
Nature-based solutions


Storm square I Emergency Condition
Rainwater
Drainage pipes
for rainwater
Safe Zone
Use of water for irrigation
systems
Outflow of water to green areas

Vertical Community– Architectural scale. Defining a social resilience restoring a community and designing heavy/lasting part of the building and flexible/light allowing future modification.

Social Catalyst – Architectural scale. The building and the open space work as a community infrastructure, using NBS as a design tool for public spaces.

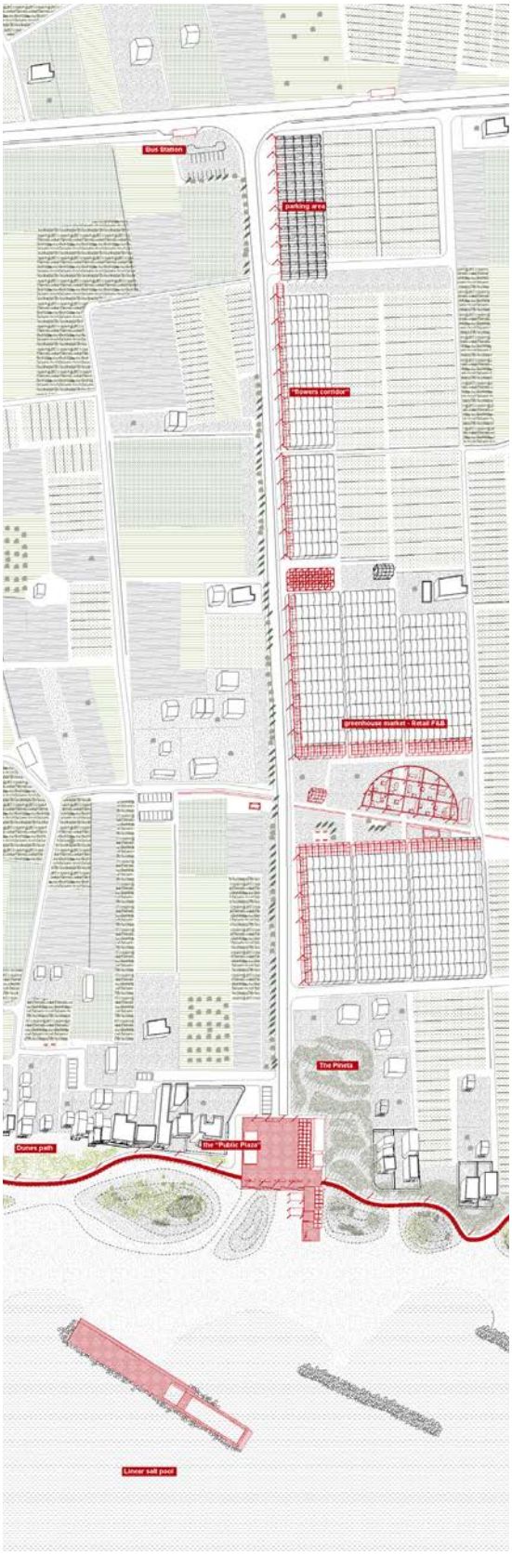


BONDING NATURES —

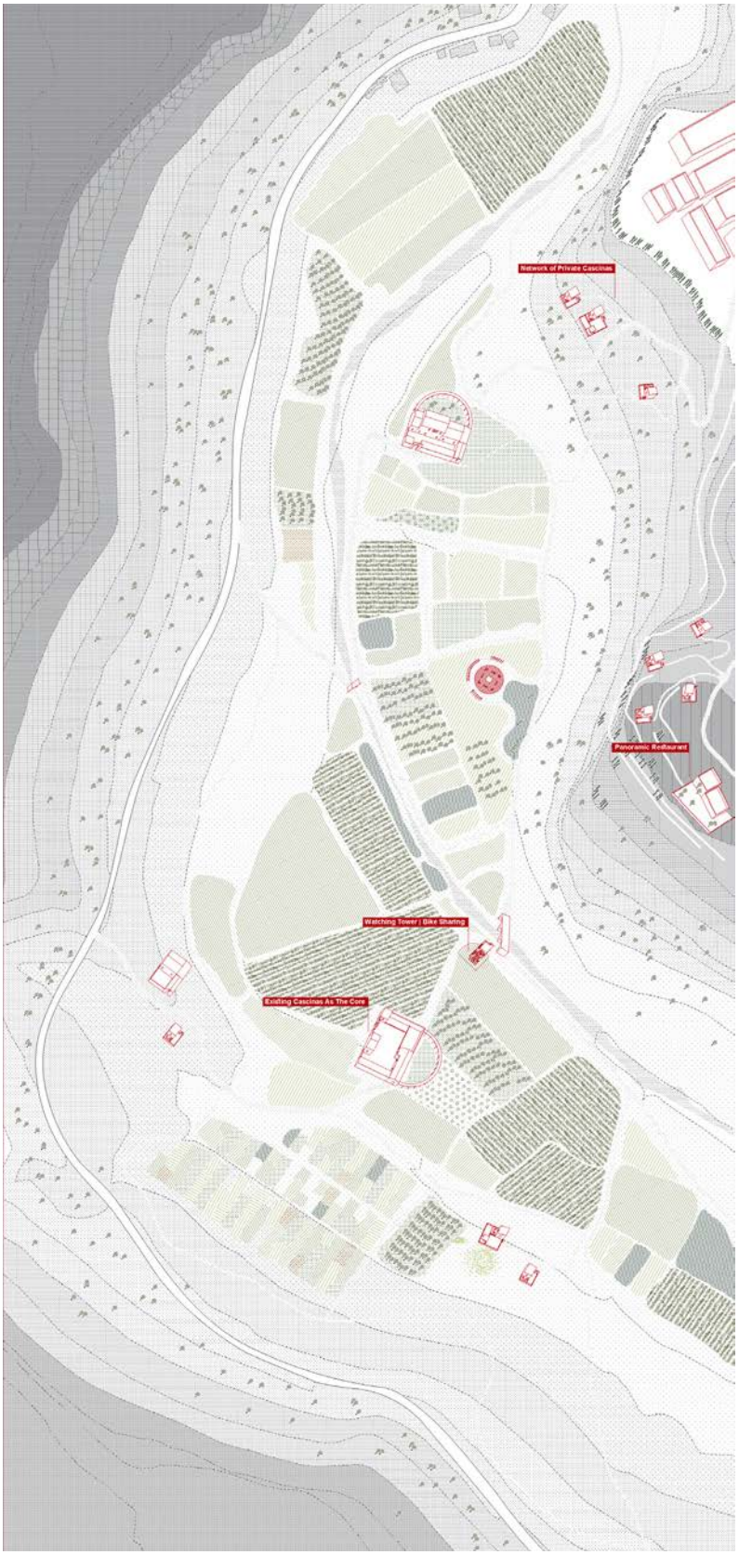
Michele Mazzoleni, Yassin Nooradini, Hooman Riazi Jorshari,
Nataliia Saltan
Final Studio, Politecnico di Milano

The bonding nature is an overview of two natural edges of Scicli city, Fiumara and Coastline, as the two key environmental elements that are overlapped with the urban infrastructures. The railway along Fiumara and a fast transit road are paralleled with coastline edge, moreover, the green-house sprawling is replacing to the typical agriculture and gardening system, consequently this configuration caused many conflicts inside the territory.
The project aims to bring gradual transitions along with these two linear elements through urban structures; mainly mobility and landscape design, in a way that can bond nature relevant to the man-activities. This study investigates the territory in two different layers; the environmental and functional program of Fiumara and coastline and finally where they are reaching together. Regarding three target groups namely, local people, workers, and tourists, the functional program explored the relation of activities and destinations. In the same way, natural elements (Fiumara and coastline) are reactivated by means of various types of urban connections, in order to sustain the destructive interventions with the nature of the site. The importance of environmental aspects focuses on grown interventions in the area, nature stretches along two paths, allows for places to rest, observe, think, meet and interact. It gives an important lively vibe to local paths which will be beneficial for the local markets inside the green houses.
With Fiumara as the starting edge of Scicli, the main strategy activation was set in urban context. The abandoned fields between railway and Fiumara have been reorganized as a green island, an urban park to serve Scicli. In this way, a system of new connections among existing Masseria (the prevalent form of farm-house) is improved. It is crossing through high-level of biodiversity and morphology variation makes a a rich condition for bike and pedestrian paths. Following the passage, a green corridor is surrounded by Canopy trees and the valley with the diversity of greenery comes next where its topography changes drastically. The Coastline as the touristic destination naturally absorbs local people, while the extension of green houses and infrastructures caused degradations in area. Provincial Road 64 – connects Donnalucata and Cava d'Aliga – as paralleled element with coastline is affecting on the secondary roads and greenhouses, as a project, they were designed with a sort of shading path, zero-kilometer restaurant, local markets. At the starting point of the street, modular car parks stop private vehicles, also this modular transformation applied to some green-houses to combine local and leisure activities. To do so, diverse urban spaces such as plazas and parks are added and equipped zones for swimming like private and public pools are considered, while adding a walkable passage which can improve the quality of the space.
To sum up, this design-based study is the consequence of synergy between two overlapped layers, natural elements and function program. Here, the mobility strategy is to experience nature as a key element for a successful economic path. Only by searching for a new balance, it is possible to create the optimal working, commercial and living conditions in Scicli.

The strategy – Territorial strategy for the project: identification of the interventions.



Axonometric Master plan. Coastline – Local path activated by shared mobility and modular design applied to car park and zero-kilometer restaurant and local markets inside the green houses.



Axonometric Master plan – Fiumara. Masseria reactivated by Agri-tourism.

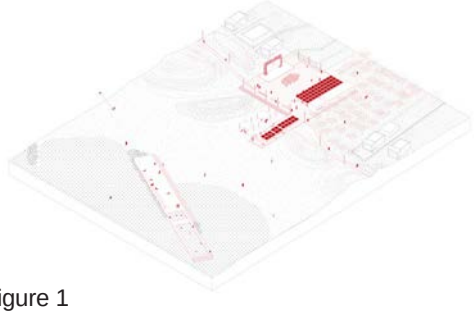


Figure 1

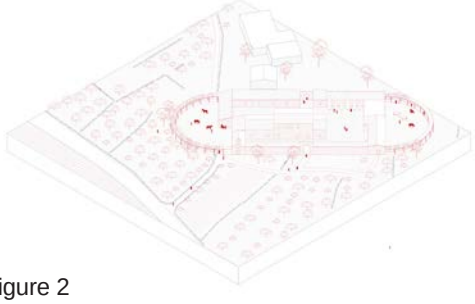


Figure 2

↑ **View point on the landscape.**

← **Agritourism activities in existing masseria**

Figure 1 –
Axonometric Model.
Coastline - Pool and
beach platform for
leisure activities.

Figure 2 – Axonometric
Model Fiumara.
Masseria reactivated
by Agri-tourism.

↙

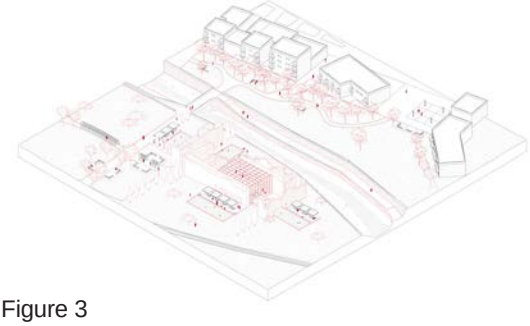


Figure 3

Figure 3 – Axonometric
Model Fiumara Spa
and park connecting to
the Scicli edge.

Figure 4 – Axonometric
Model Coastline.
Vegetable and fish
markets inside
the green house
structure sustain
the activities directly
from production to
consumption.

↓

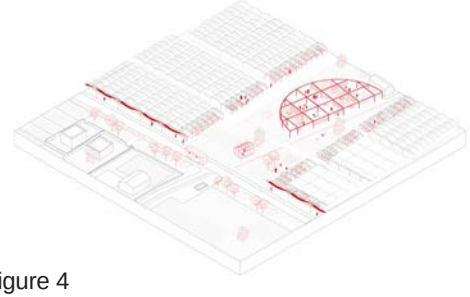
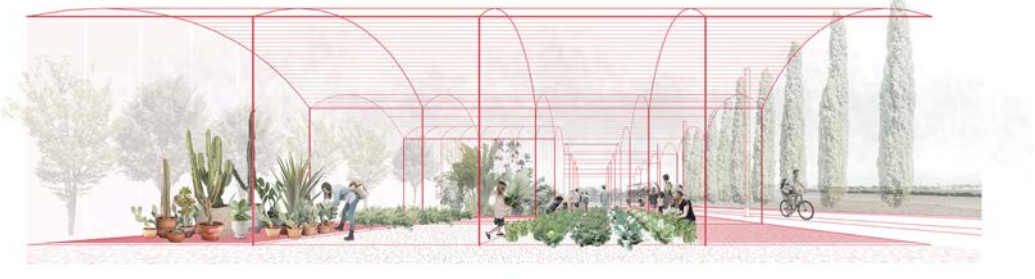


Figure 4

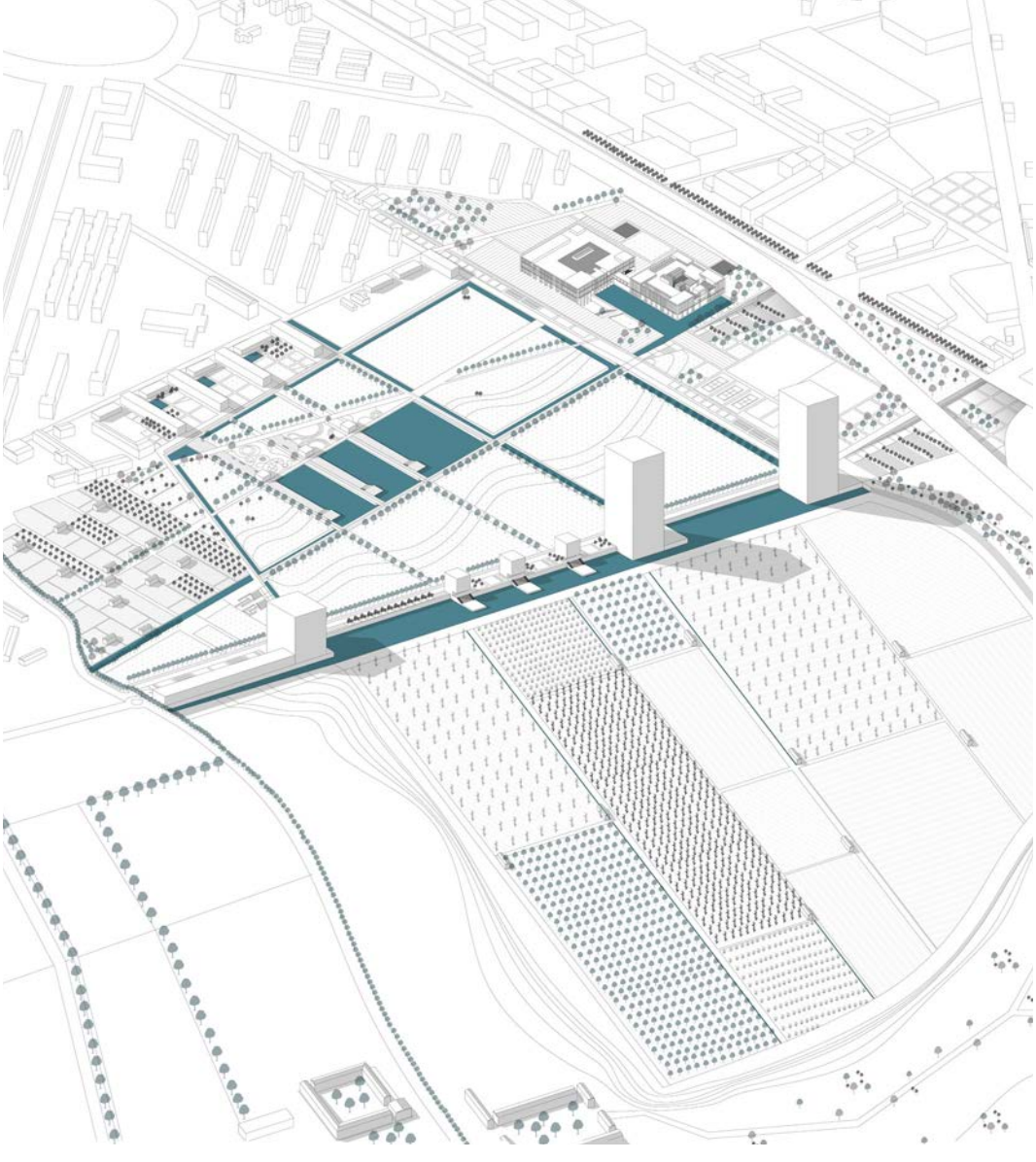


↑ **Local markets inside the green houses.**

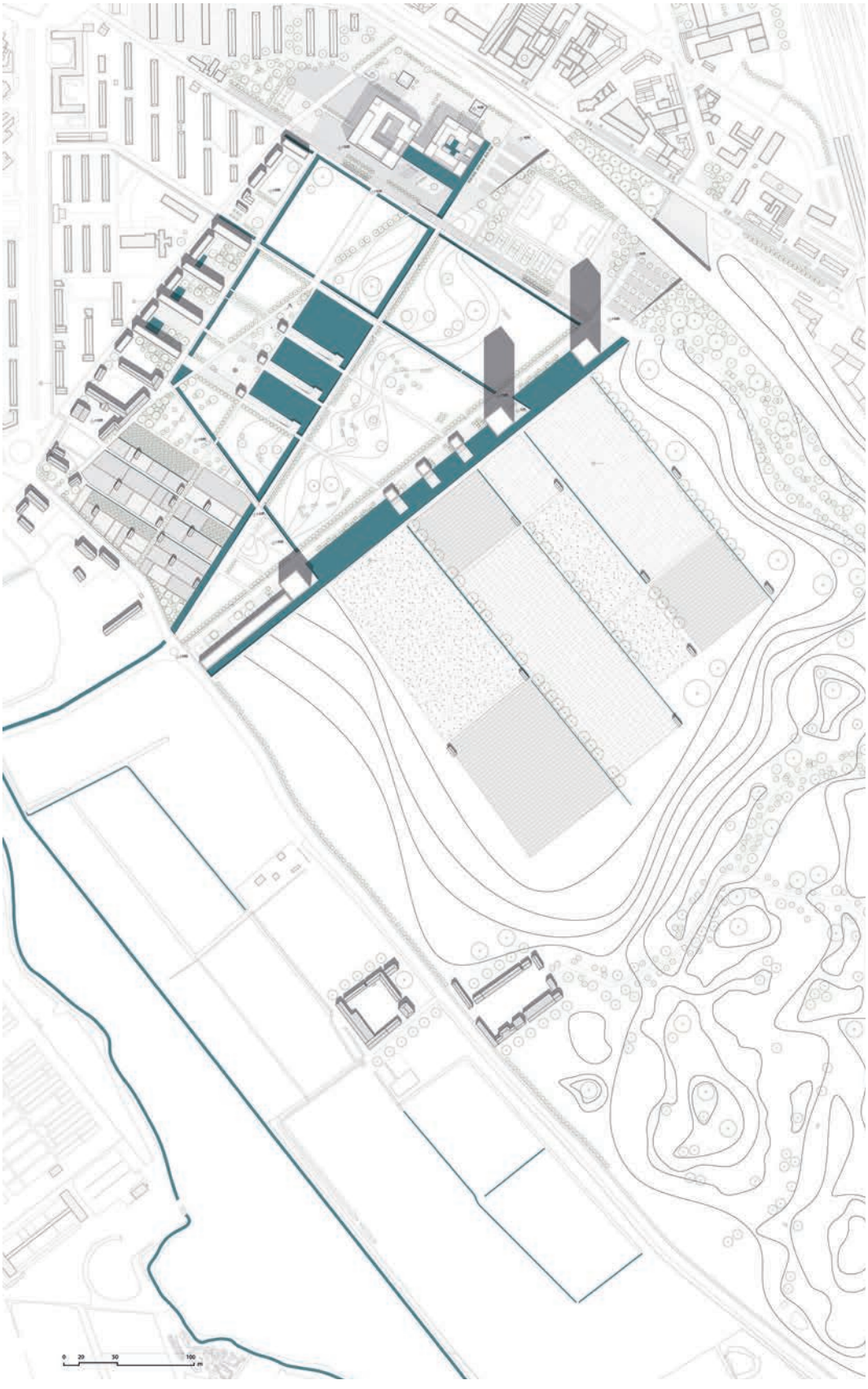
WATER AS REGENERATION ELEMENT FOR THE MARGINS: A NEW IDENTITY FOR PORTO DI MARE —

Gianandrea Blaconà, Daniele Marturano
Master Thesis, Politecnico di Milano

The project was shaped following the design proposals carried out in the studio concerning the theme of re-forming Milan, more with regard to the Porto di Mare. The area appears as a fragmented peripheral margin, a border between the urban fabric and a vast system of green areas, placing clear boundaries between nature and artifice.
The main intent of the project is to re-form this portion of the city, integrating it with the Milanese context, thus giving life to a new polarity for the community. The project intends to maintain an active relationship with the historical memory of the place and at the same time define new spaces that are increasingly vital, usable by the community. This connection with memory is strengthened thanks to the use of water as a design element, which allows you to work on three very specific levels of redevelopment: urban, social and environmental.
The first level uses water as an element of reconnection with the city fabric, allowing the reconstitution of strong relationships with the context adjacent to the intervention area, which have now disappeared, thus defining new urban centralities. The thesis, therefore, aims to give a concrete and planning answer to the now disfigured relationship between water and the city of Milan, a relationship that has disappeared due to rapid and sudden progress. Milan best represents this change of trend in the relationship that once supported the social life and the economy of the city itself, a relationship that is now forgotten and in a certain sense denied.
The second level involves the use of water as an element of socio-cultural requalification, through the design of two buildings, one for thermal use and the other for cultural use. The thermal buildings, historically closely related to the cultural ones, characterized by the presence of water inside them, are an architectural response to the presence of water in the city.
The third level identifies water as an environmental resource and highlights the problem of waste associated with it.
The design of the masterplan envisages the creation of large green areas for both agricultural and urban park use, with the aim of regenerating the land that is now ‘consumed’ and deprived of its ability to manage rainwater and store CO_2.
The history of Porto di Mare tells us of this area as a place full of water, a place of meeting and connection, which in recent decades, due to the urban planning that characterized the last century, has transformed into a conglomerate of buildings without form and beauty. Thanks to a careful understanding of the need to design in a sustainable way and embracing the issues addressed by the municipality of Milan, as regards Milan 2030, it was decided to free this area by bringing out the history linked to it and to mend a margin which had now become a fragment. In the drafting of the Masterplan, all the issues related to land consumption were examined, trying to make this space a green margin capable of making a contribution both to urban inclusion and to eco-sustainability.
The main intent of the project is therefore to adhere to a more sustainable marginal design and to initiate a process that will lead the Porto di Mare area to be a self-sufficient and sustainable neighborhood.



↑ **Water landscape** – A renewed landscape.


0 20 50 100 m

Experiencing water – Figure1: water as new growth
Figure 2: water as purity
Figure 3: water as playground
Figure 4: water as a way to move
Figure 5: water as calm and peace

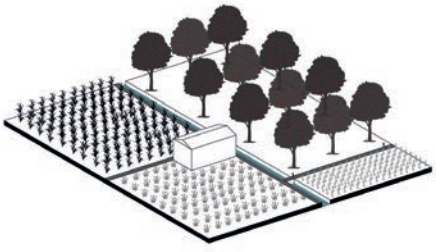


Figure 1

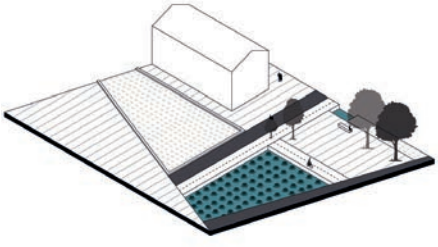


Figure 2

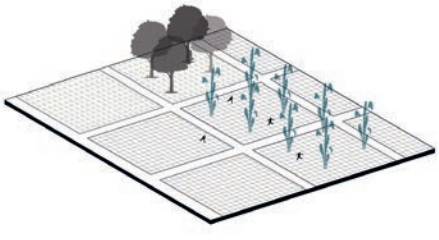


Figure 3

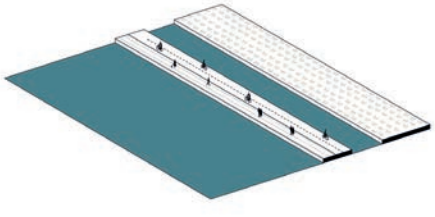


Figure 4

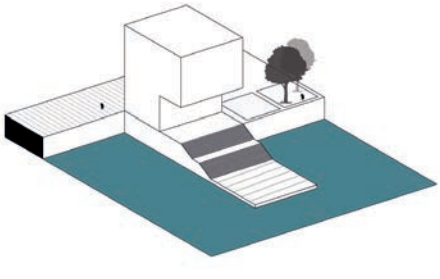
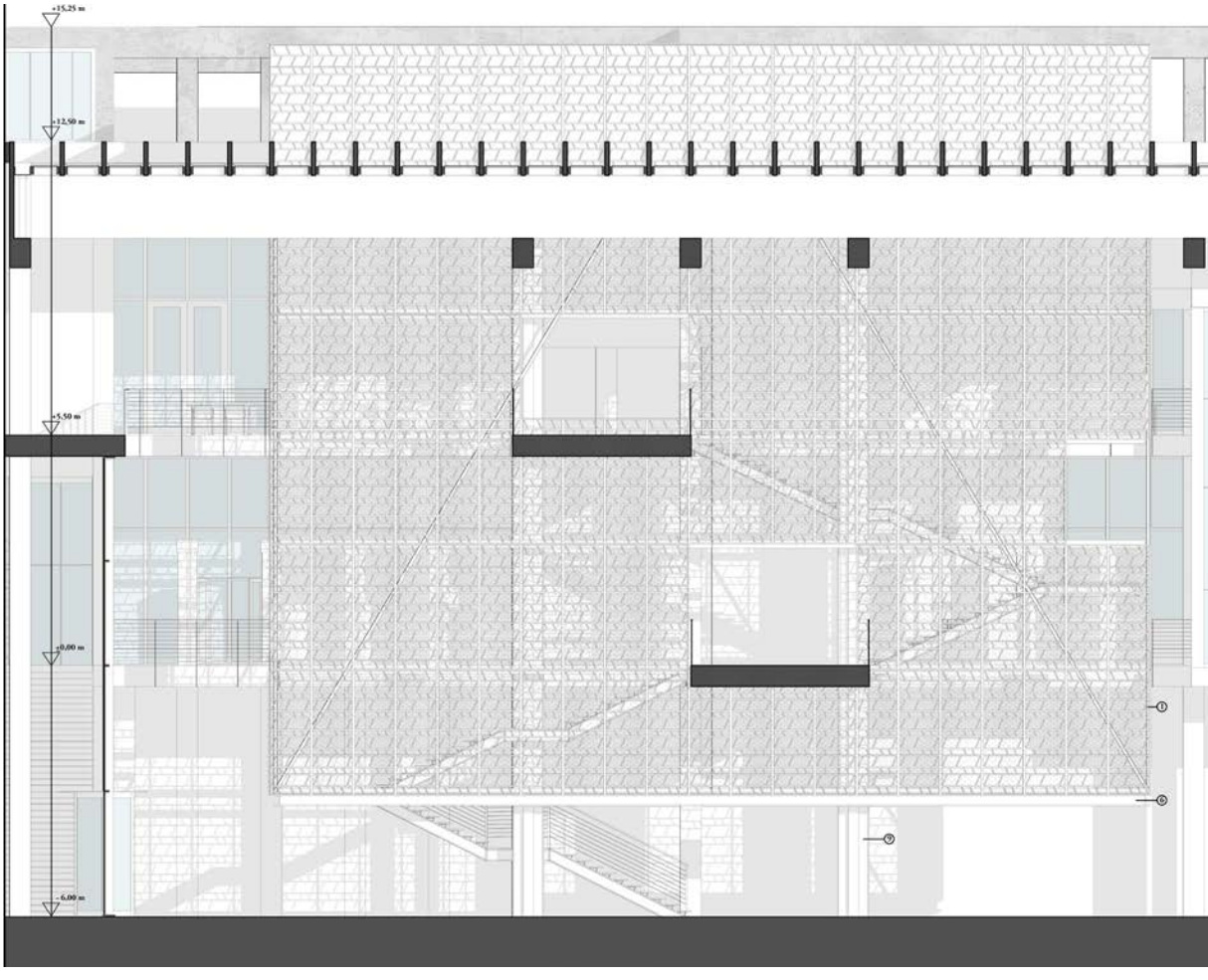
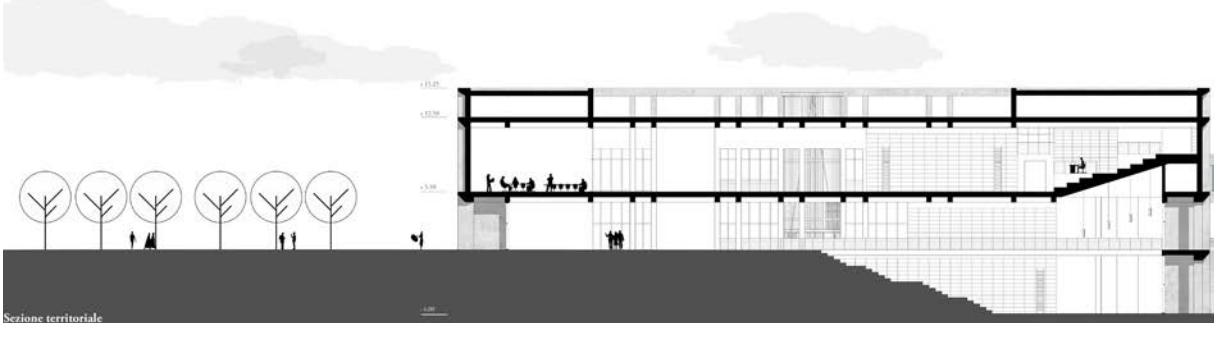


Figure 5

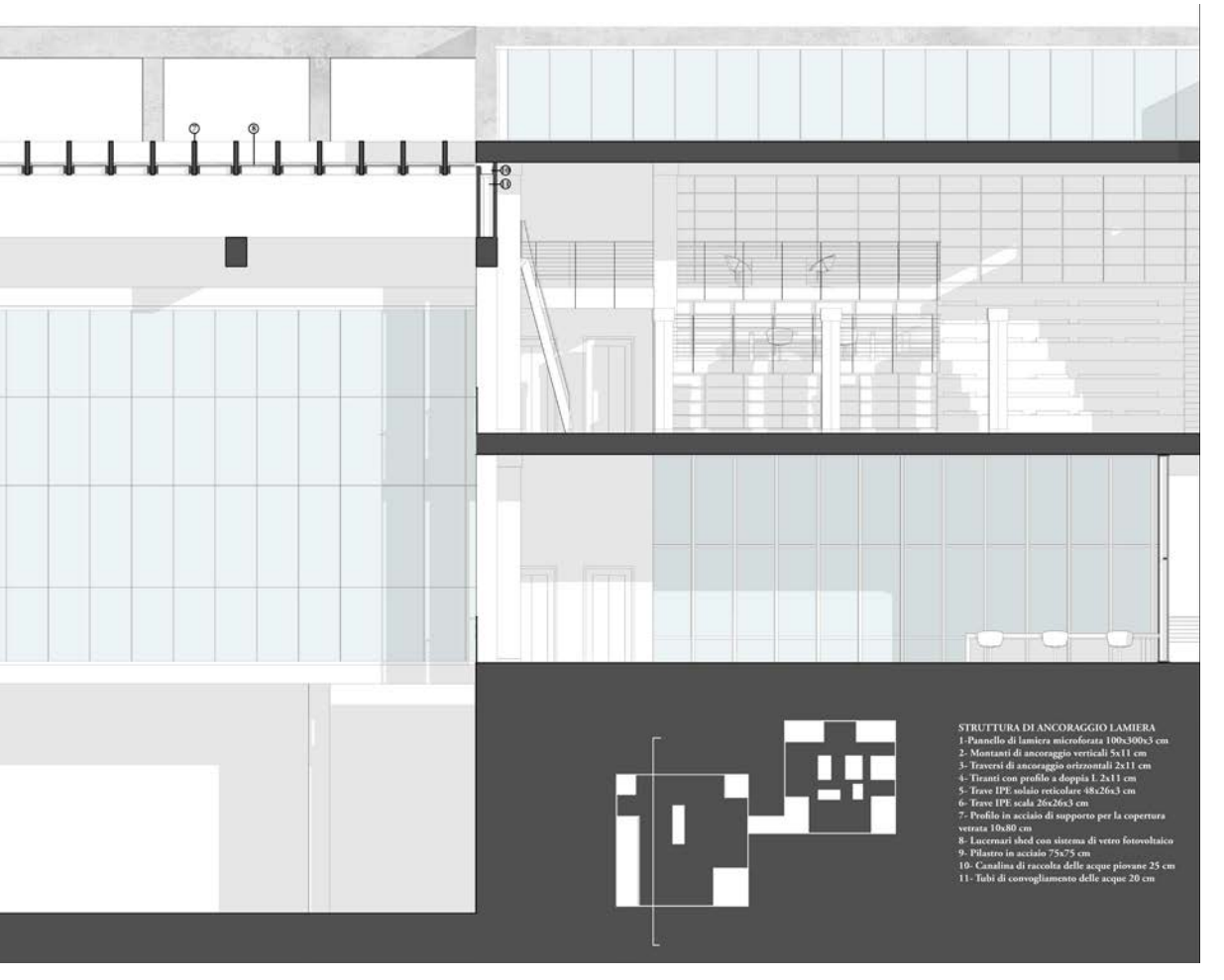
Masterplan – General design urban strategy for the redevelopment of Porto di Mare district



↑ **Detail section of the thermal building foyer**



↑ **Section of the intervention.**


STRUTTURA DI ANCORAGGIO LAMIERA
1-Pannello di lamiera microforata 100x300x3 cm
2- Montanti di ancoraggio verticali 5x11 cm
3- Traversi di ancoraggio orizzontali 2x11 cm
4- Tiranti con profilo a doppia L 2x11 cm
5- Trave IPE solaio reticolare 48x26x3 cm
6- Trave IPE scala 26x26x3 cm
7- Profilo in acciaio di supporto per la copertura vetrata 10x80 cm
8- Lucernari shed con sistema di vetro fotovoltaico
9- Pilastro in acciaio 75x75 cm
10- Canalina di raccolta delle acque piovane 25 cm
11- Tubi di convogliamento delle acque 20 cm

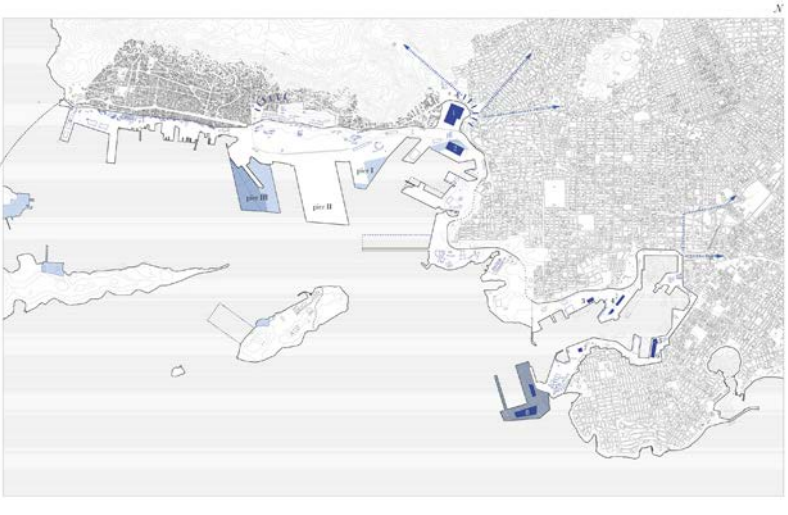
INSULAR URBANITIES —

Louis Bernard de Saint Affrique
Master Thesis, Delft University of Technology

Every human being is driven towards creating its own bubble, self-contained worlds, islands. It can be equally seen on the urban level where this insular condition is a proliferating phenomenon. The contemporary city is characterized by the widespread propension of certain metropolitan fragments to detach themselves from their continuum of the city. Driven by the increasing dependency on logistics, this condition becomes a globalized urban form. It tends to become the privileged form of spatial organization in the contemporary city. Ports being its most accomplished version, by their monumentality, radicality and juxtaposition with the city. They tend to become territorial exceptions, ground exceptions, urbanization exceptions, time exceptions and legal exceptions at the heart of the city.This is particularly visible in the cities neighbouring the port of Pireas, that has for some years been the site of an impressive transformation since the port was acquired by the Chinese. Since then, the port grows exponentially with the ambition to become the main commercial door to Europe for Asian importations. To accommodate ever more docks, the port progressively cannibalizes any available coastline. Gradually, the city finds itself encapsulated, trapped and asphyxiated by a large infrastructural barrier, without any access to the sea. The ports, supposed to be windows on the worlds become constrictive elements. The city of islands is at risk of becoming a city of conflicts. We need to find ways of diffusing that tension.This project suggests an aggressive welcome to the urban condition created by the port while proposing to reclaim Pireas' relationship with the seaboard. As the waterfront of the cities is turning into an infrastructural product, the new boardwalks may become perpendicular lines. The project investigates this hypothesis. It thus proposes a perforation through the infrastructural barrier from town to sea in an underused interstitial space of the port. It invites us to re-imagine the spatial relationships between architecture, landscape, energy and infrastructure in ports.

↑ **A perpendicular boardwalk** – Phisical model of the intervention.

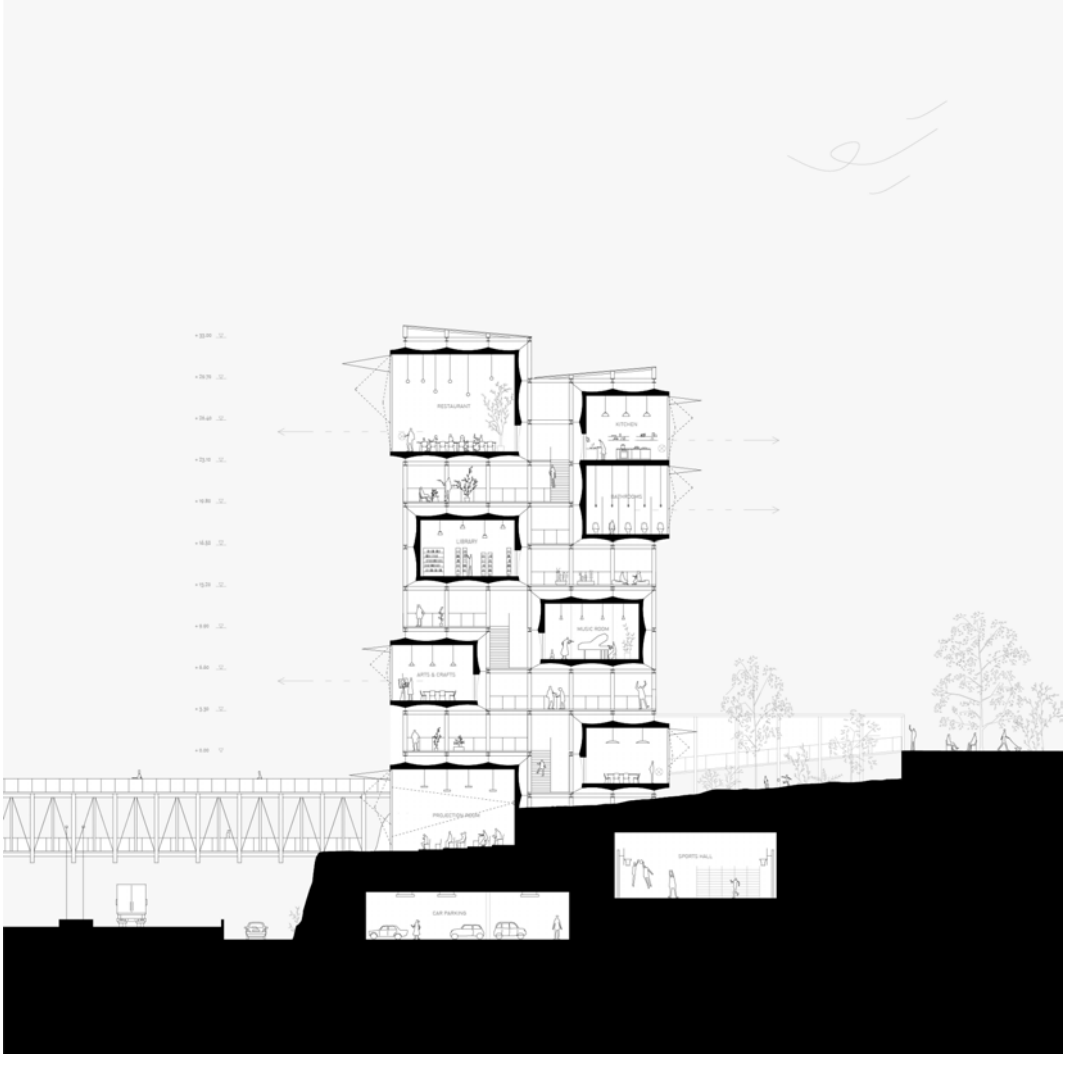
An urban research – Composition of the port of Pireas.



An urban research – Masterplan and expansion of the port in the bay.

An urban research – Exceptions in the port, rares accesses to the sea.

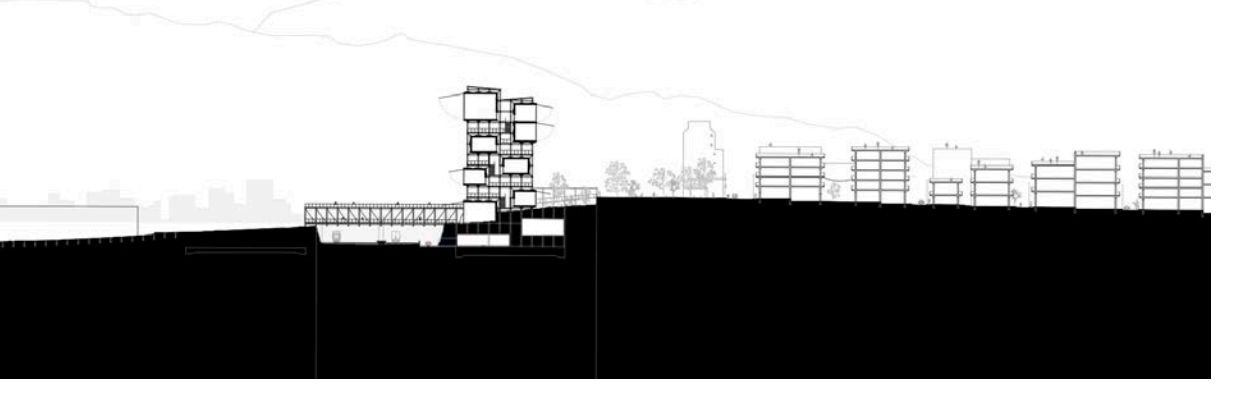
↑ **Reconquest of the horizon.**



↑ **The project of the tower.**

↑ **Reinvest the seascape as a place of cityness.**

↑ **Territorial section.**

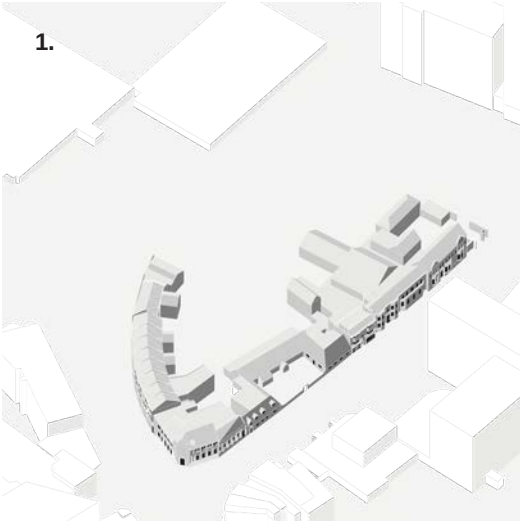


LINEARITIES: CORAL REEFS IN THE SEA OF URBANITY —

William Guild
Master Thesis, Delft University of Technology

The post-industrial city has become a fragmented landscape of urbanisation. The rational city of the modernist era has been eroded by the forces of globalisation and the liberalised economy, erasing the traditional points of reference in the urban environment. Consequently, this space has become increasingly illegible. Koolhaas notes: ‘We were making sandcastles. Now we swim in the sea that swept them away’. Similar Deyan Sudjic describes the city as ‘an urban soup’.However, a new form of ‘city-ness’ is emerging from the dullness of urbanisation. It is forming around stations, along road arteries and connected by optic fibre cables. Following the lines of infrastructure, these linear fragments of development thrive on diversity, density and perpetual change: we call them urban coral reefs. Linear in their form, these complex ecosystems provide a new habitat for the urbanites of the twenty first century.This is particularly noticeable in the suburban centres, like Ilford in East London, where the myth of Metroland has collapsed and city dwellers now look to more accessible places to live. The comfort of the semi-detached house with a garden has been substituted for the convenience of living near a train station. As Paul Virilio and Antoine Picon explain, time and speed are now more important than distance.This change in habits has engendered an unprecedented migration from the leafy residential streets of suburbia to the dense centres and high roads, which were traditionally reserved for commercial and retail uses. In Ilford, speculative high-rises and apartment blocks are replacing the decaying industrial sheds and vacant lots that once populated parts of the town centre. The influx of new residents will put pressure on the existing public spaces and amenities as densities in the area top the scale for the London Metropolitan Area.In this context, there is a growing need to ensure the resilience of the reef by creating a legible and engaging space that can support the needs of the community and cater to a changing demographic.

↑ **External view of the main building.**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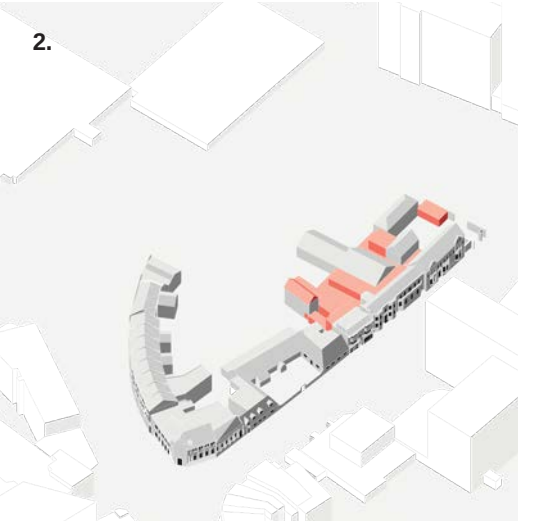
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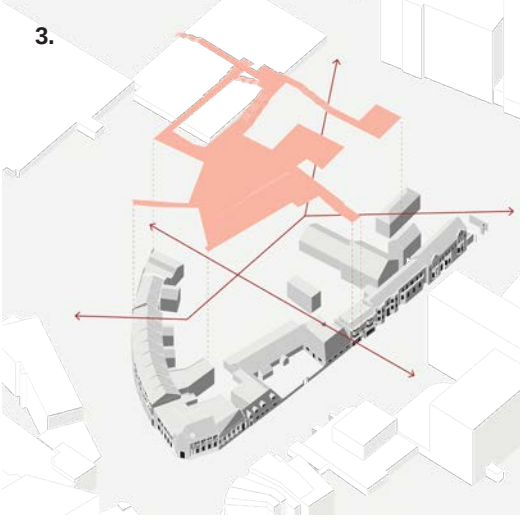
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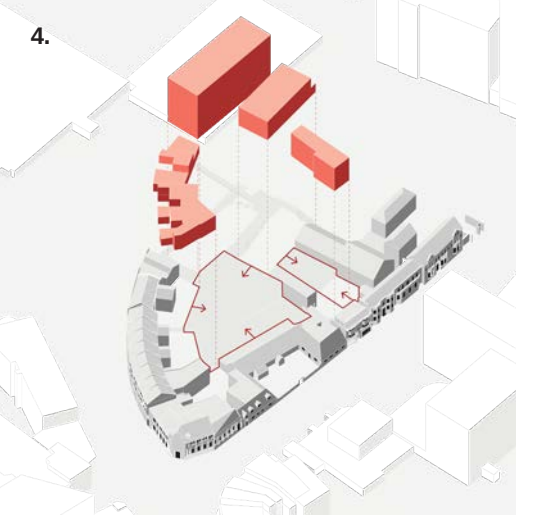
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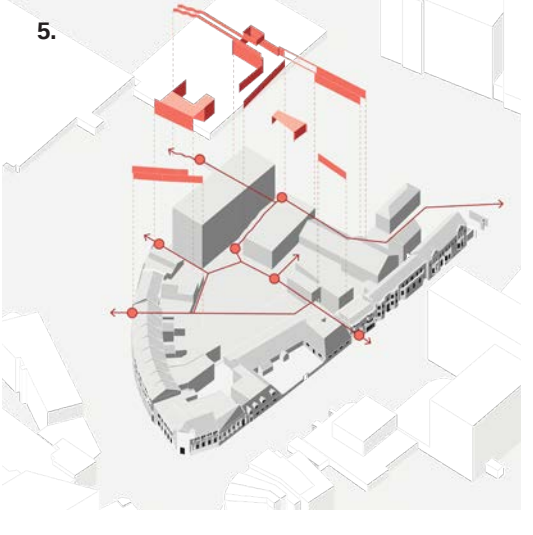
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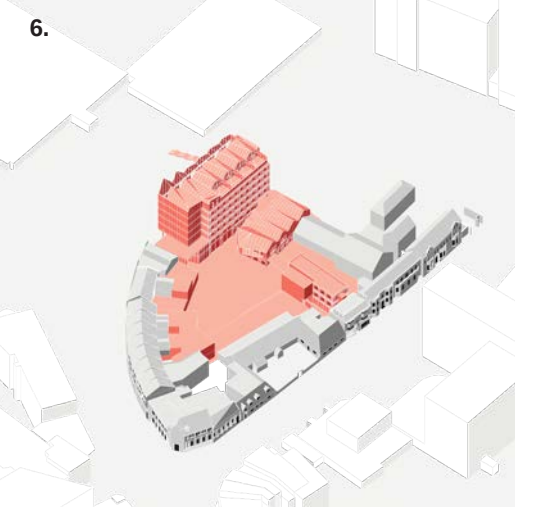
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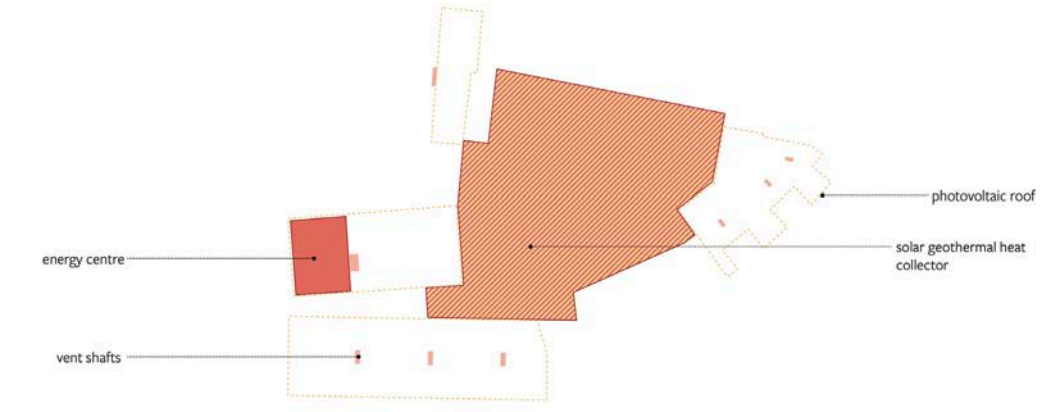
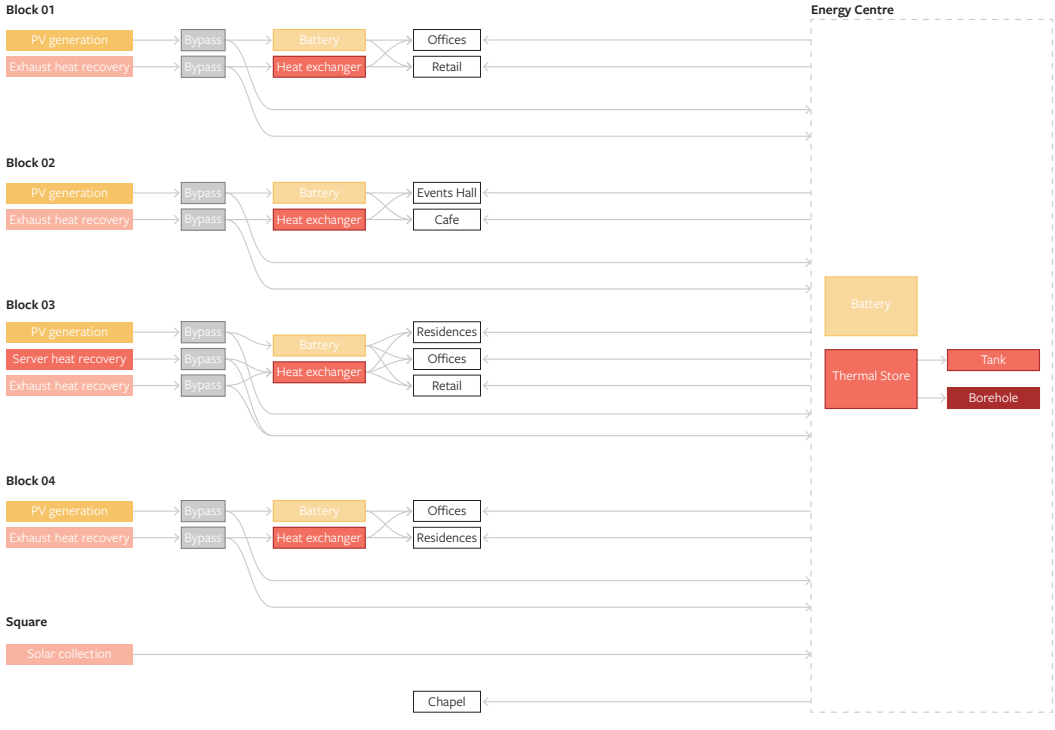
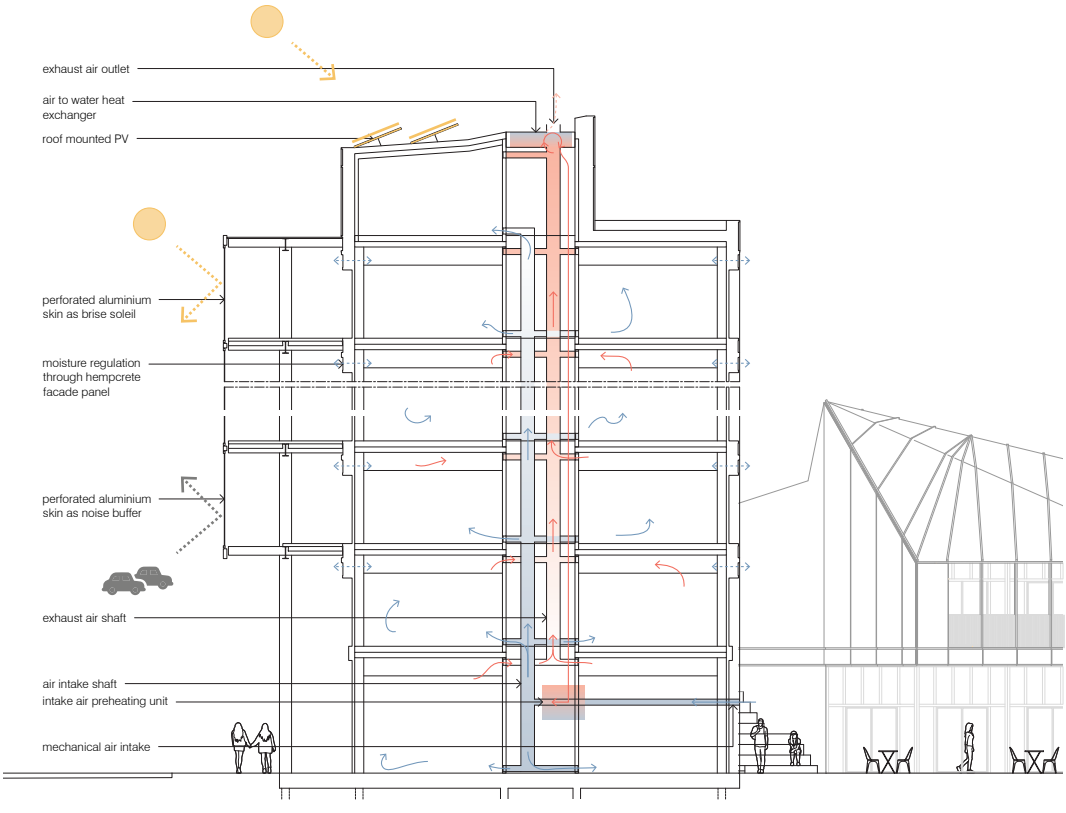


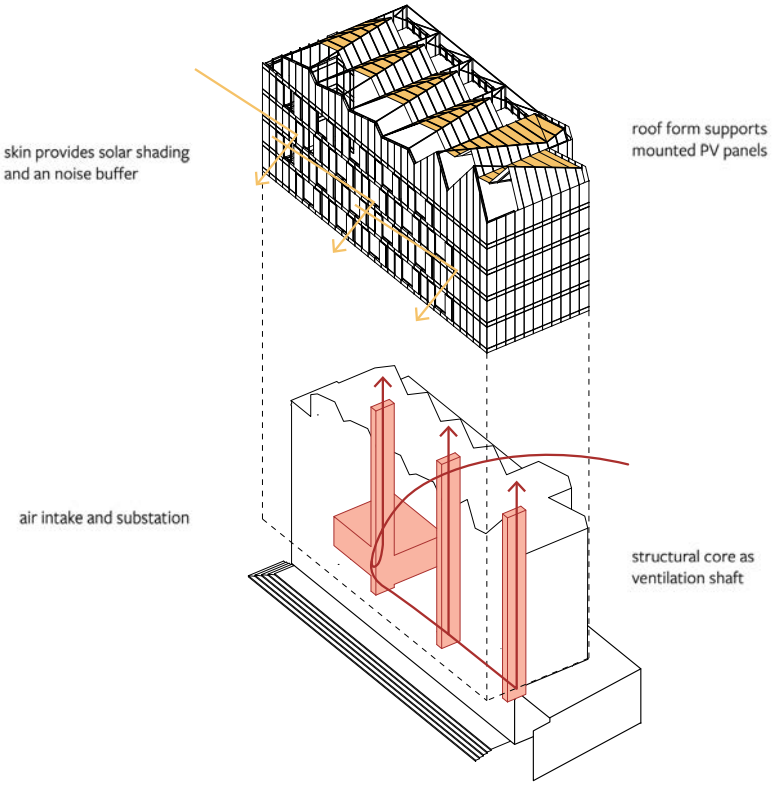


Design Development – 1. Existing site condition 2. Demolition, key portions of the block are removed 3. Routing, routes through the site are defined 4. Infilling, new massing is inserted to frame the new square 5. Grafting, additional facades are stretched onto the backs of existing buildings to complete the composition 6. Materialising, consolidation of the block through coherent material choices.

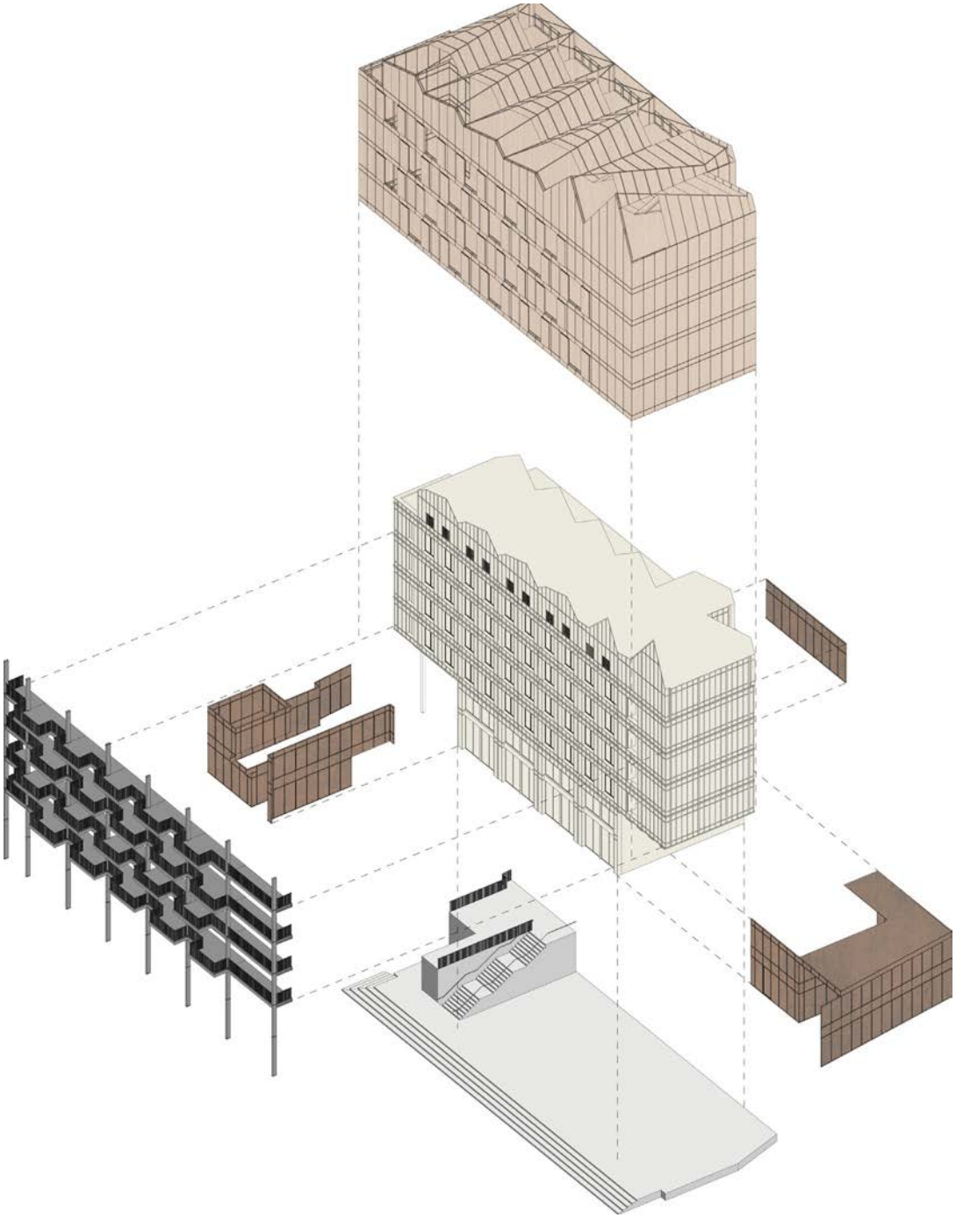
Energy strategy.



Climate strategy.



Climat strategy – Integration of the climate strategy with the architectural composition.

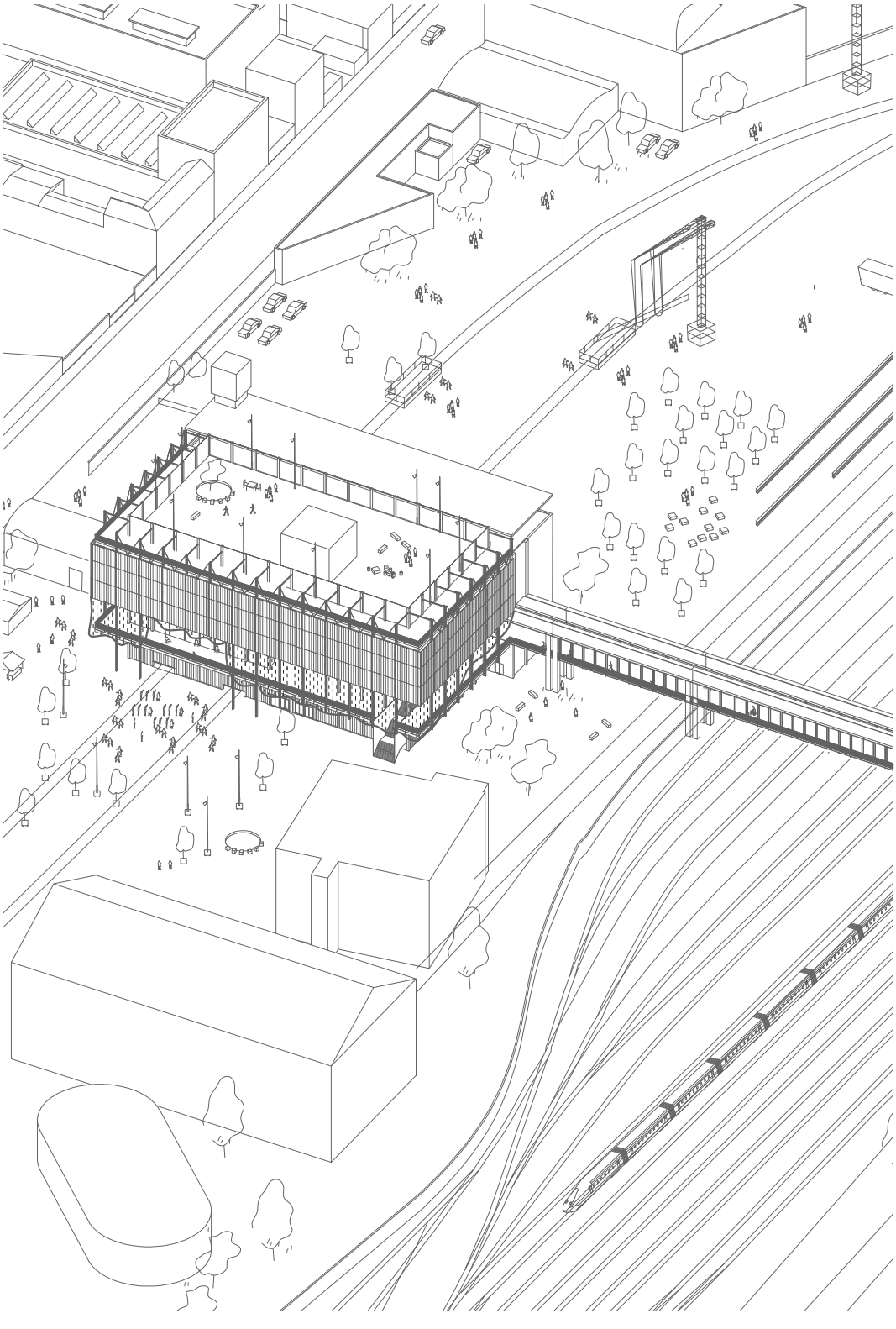


↑ **Tectonic** – Project's layers.

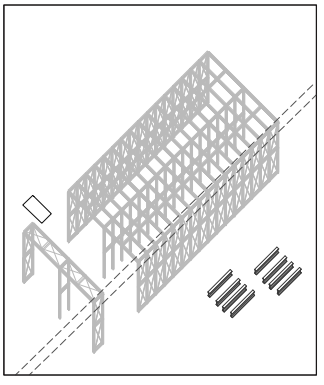
TWO POINT PRESPECTIVE: A GLO-CAL PERFORMANCE OF CONTEMPORARY CITIES —

Andrea Cappiello
Master Thesis, Delft University of Technology

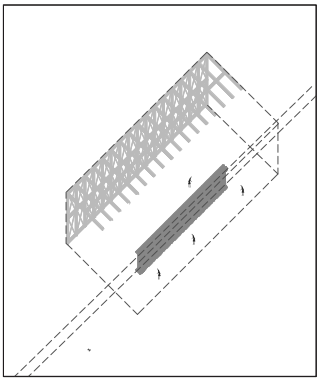
My master thesis project revolves around the theme of festivalisation of contemporary cities. This emerging phenomenon sees the instrumentalization of cultural events and festivals into powerful economic tools to attract a global flow of event-driven tourists. This economic model, together with the fast development of infrastructural fast connection has led to an intensification of the number of events planned throughout the year, which shifts the notion of events as temporal manifestations, towards a permanent asset of our contemporary cities. Such constant intensity of global flow is threatening the traditional role of public space, as commercial space for global customer is prioritised over civic space for local inhabitants. The research investigates the new spatial consequences of such phenomenon in the dynamics of contemporary cities and searches for solutions that can address this necessary dichotomy between the global and the local. The design project analyses the case of the city of Milan, a contemporary city that is strongly betting on the cultural economy, hence the festivalisation of its city centre to attract global event-driven tourism.The project looks at the area of Rogoredo, one of the 7 abandoned railway yards, surrounding the city of Milan, as a key site that can embrace this contemporary dichotomy. Looking into spatial solutions that can transform what today is an infrastructural barrier into a valuable event-based public space of the future. The project focuses on architectural solutions to maintain and revalue the railway yard of Rogoredo (Milan) and its surrounding. By the reuse of the existing infrastructural framework of the site, no longer as a transit hub but as a construction hub, this project shows how it could lead to the design of flexible, reversible public spaces to host these series of cultural/ economic events, and improving the local contexts. In other words, looking at the advantages (economical and sustainable) of avoiding a tabula rasa scenario of the site, and instead reusing, and integrate the existing infrastructural framework (from train tracks, train cars, abandoned warehouse, etc) together with the series of industrial clusters that are present in the proximity of the site, to regenerate the area from an ex-mobility node to future proof, flexible construction arteria which can rely upon local (on-site) construction industries. Eventually transforming Rogoredo as one of the key glocal cultural nodes of the city of Milan.



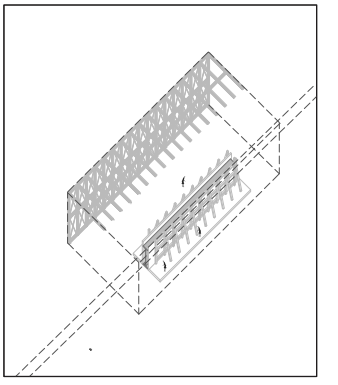
↑ **General axonometry of the intervention.**



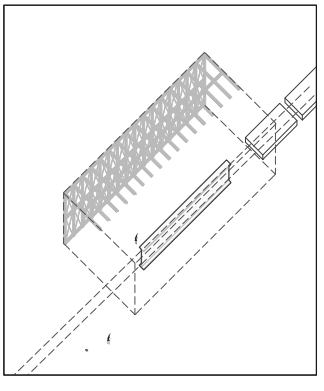
Temporary warehouse assembly



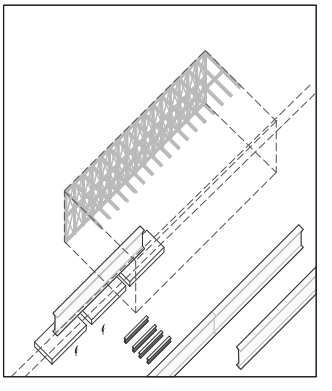
Reinforcement element preparation



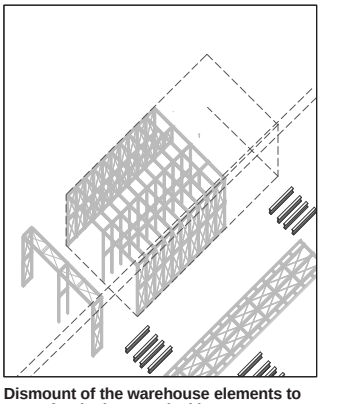
The foam-work and in-situ concrete pouring



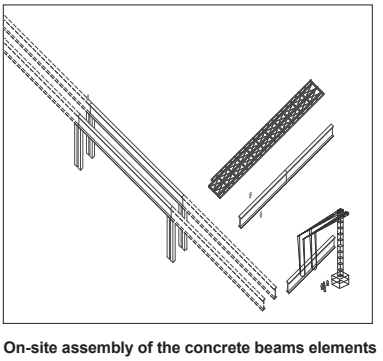
Element transportation via traintrack



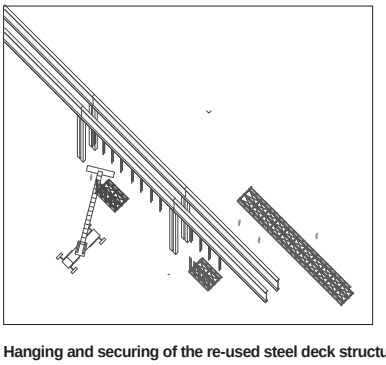
Repetition of the process



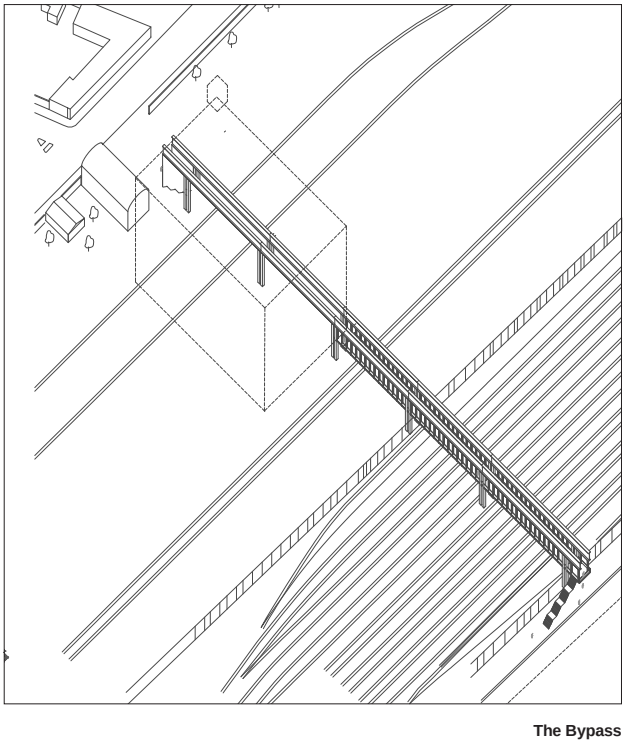
Dismount of the warehouse elements to reuse for the bypass decking structure



On-site assembly of the concrete beams elements

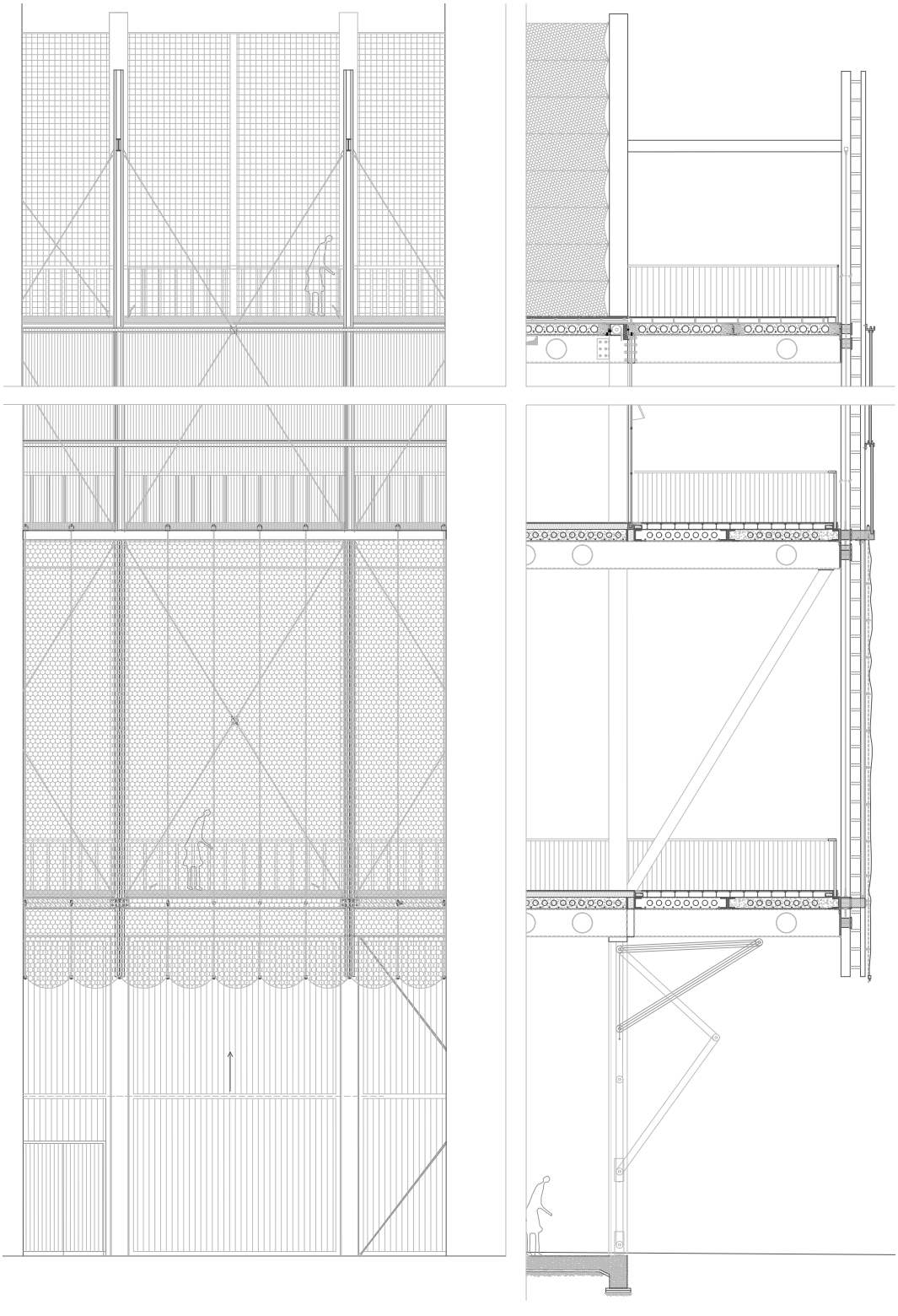


Hanging and securing of the re-used steel deck structure



The Bypass

↑ **The Construction of the Bypass** – Step by step process.



↑ **Facade detail.**

↑ **The Global Curtain** – The global face of Milan.

↑ **The Grand Entry** – The new boulevard from Porto di Mare Station.

URBAN AGRICULTURE, A CASE OF WARSAW —

Maciej Polakowski
Master Thesis, Warsaw University of Technology

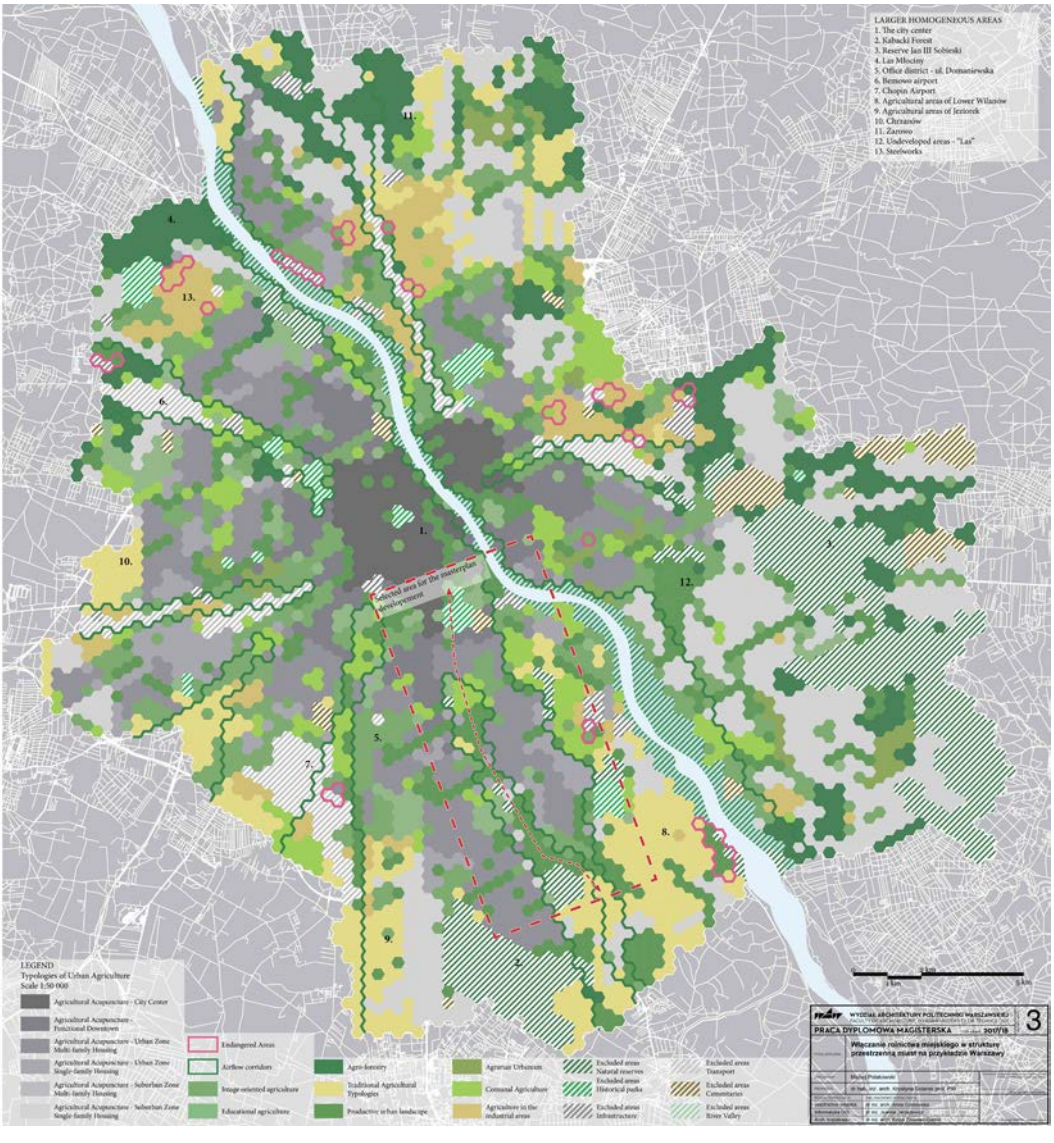
Contemporary cities are complex spatial structures of varying density and are in close re-lationship with the rest of their region. This causes the typology to change in cities and trans-forms the boundaries between urbanized areas and rural areas, regardless of the administrative boundaries. Agriculture has the potential to become a valuable component of the urban system in the economic, social, spatial, ecological, and political aspects. The thesis was an attempt to de-velop a coherent, comprehensive planning vision of the spatial development trends of the city of Warsaw-based on the idea of urban agriculture.

Urban farming is a vast and often misinterpreted term. Contemporary agriculture is an issue that goes far beyond common generalizations and eludes well-established patterns of thinking. The discussion on urban agriculture cannot take place without asking the question about the relationship between the city and the countryside. Agriculture as a land function, business model, and lifestyle are traditionally associated with rural areas. As cities developed, they shifted their borders, displacing or absorbing rural structures and influencing changes in the ways of using the areas associated with them. By accepting the presence of agriculture in the city structure, we agree to blur the rigid division into town and country, with all the consequences of this decision. There are several questions to be asked about the integration of agriculture and urban structures.

Urban farming and community gardens can be a catalyst for change in cities. Temporary or permanent use of degraded areas and problem areas for agrarian crops increases the quality of urban space and the economic dynamics of the site. These are often investments in public space with low financial outlays and guarantee the constant presence of people involved. Different types of city gardens have different social potential: strengthening neighborly ties, fighting against social exclusion, struggling against child malnutrition, rehabilitation of the mentally and physically ill, removing cultural barriers between residents and new immigrants from rural areas, lifting generational barriers, activation of the elderly.

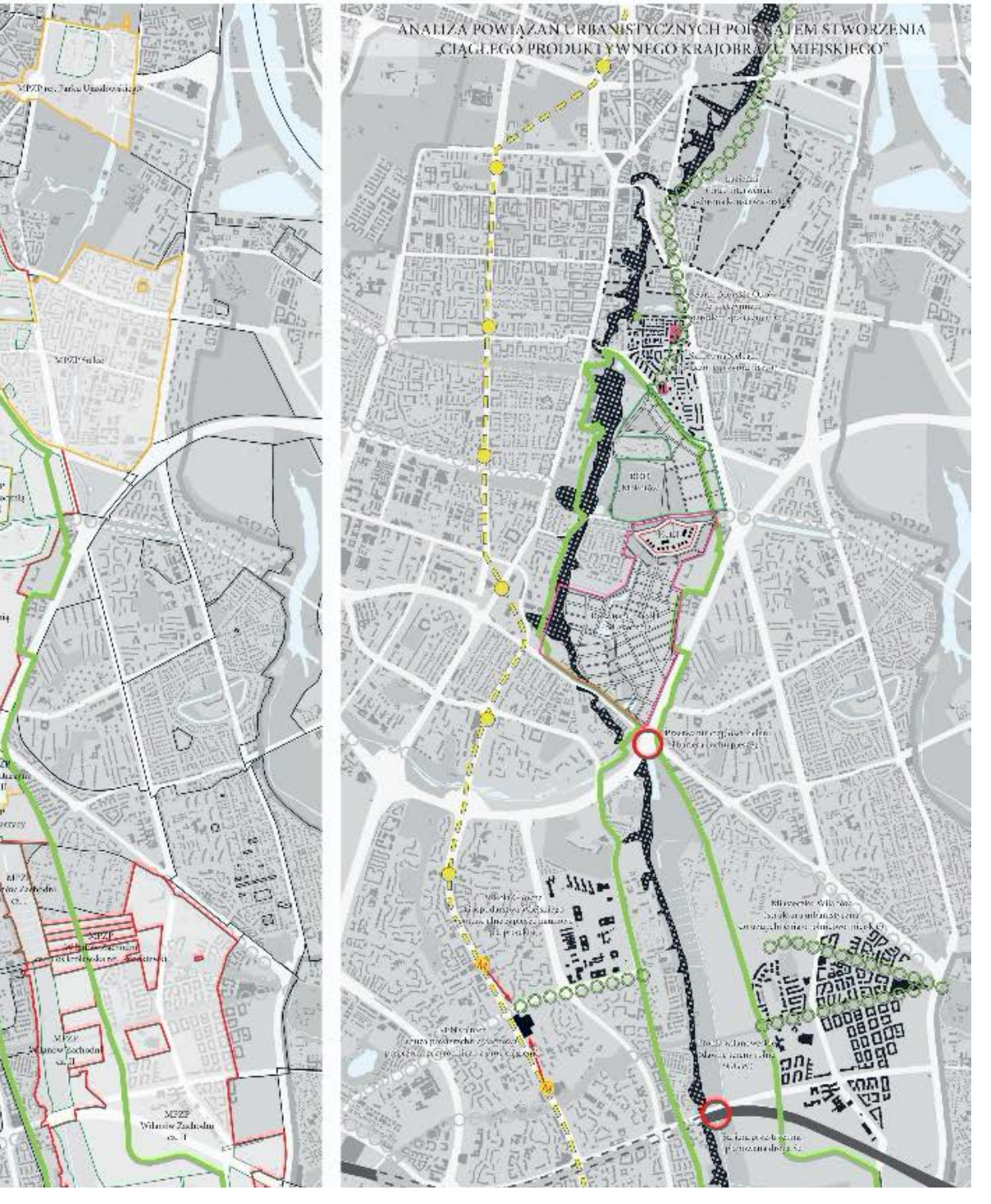
The master's thesis was divided into two parts. The first part was the theoretical foundation and review of the literature on the subject, necessary to carry out the design work. Part two of the thesis were research and design studies in graphical and descriptive form.

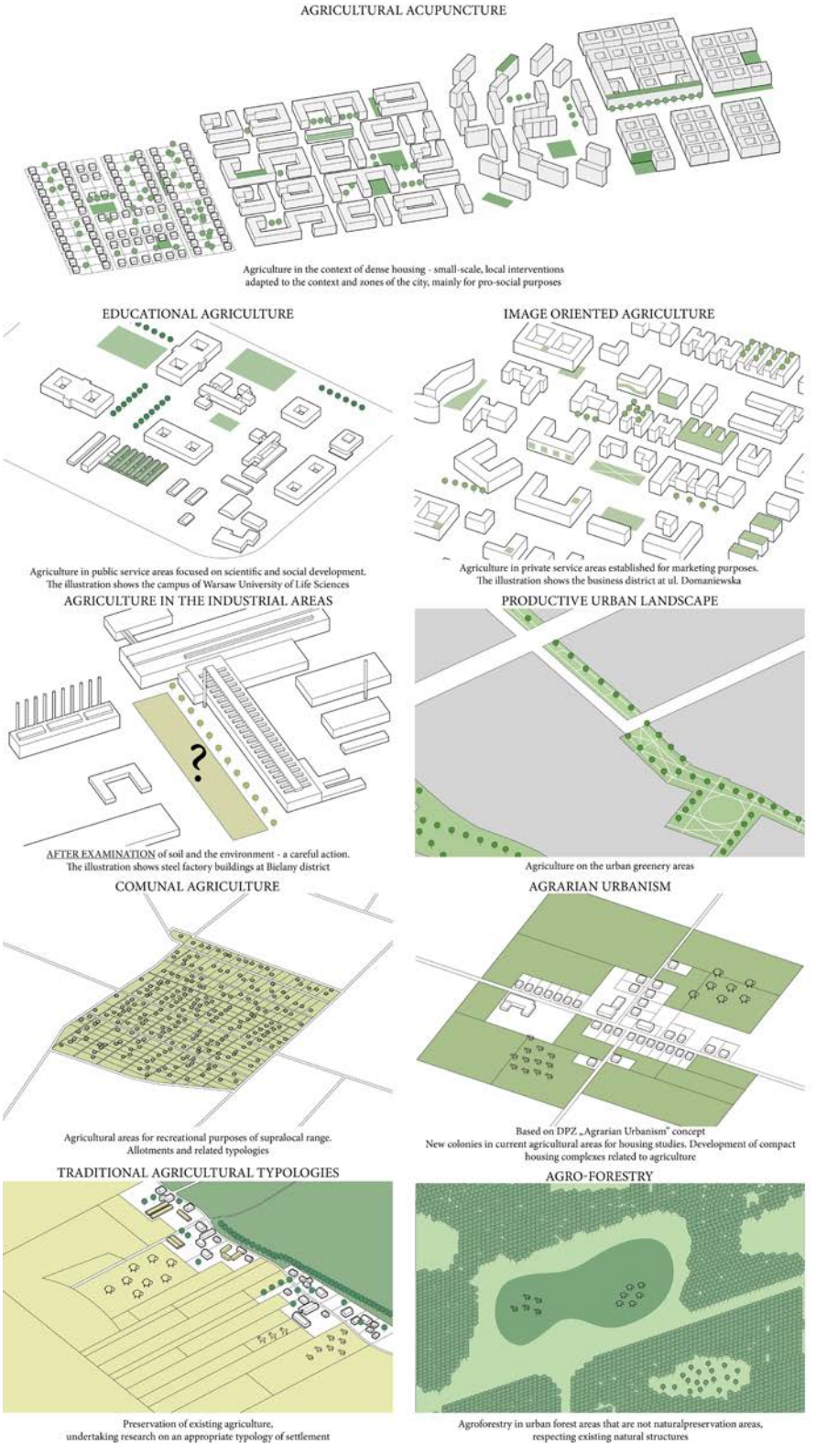
The city-scale design was modeled based on the official document of the spatial development of Warsaw using advanced digital techniques as the Voronoi diagram and GIS software, it also outlines the agro-urban typologies. In the chosen location – the strip of open areas which is a corridor for air supply and regeneration for the city different programmatically and typologically urban agriculture units were distinguished in the masterplan. The selected unit, being part of the masterplan's assumptions, is the 'urban agro-park' solved in detail at scales 1:1000 and 1:500 as an architectural and landscape design.



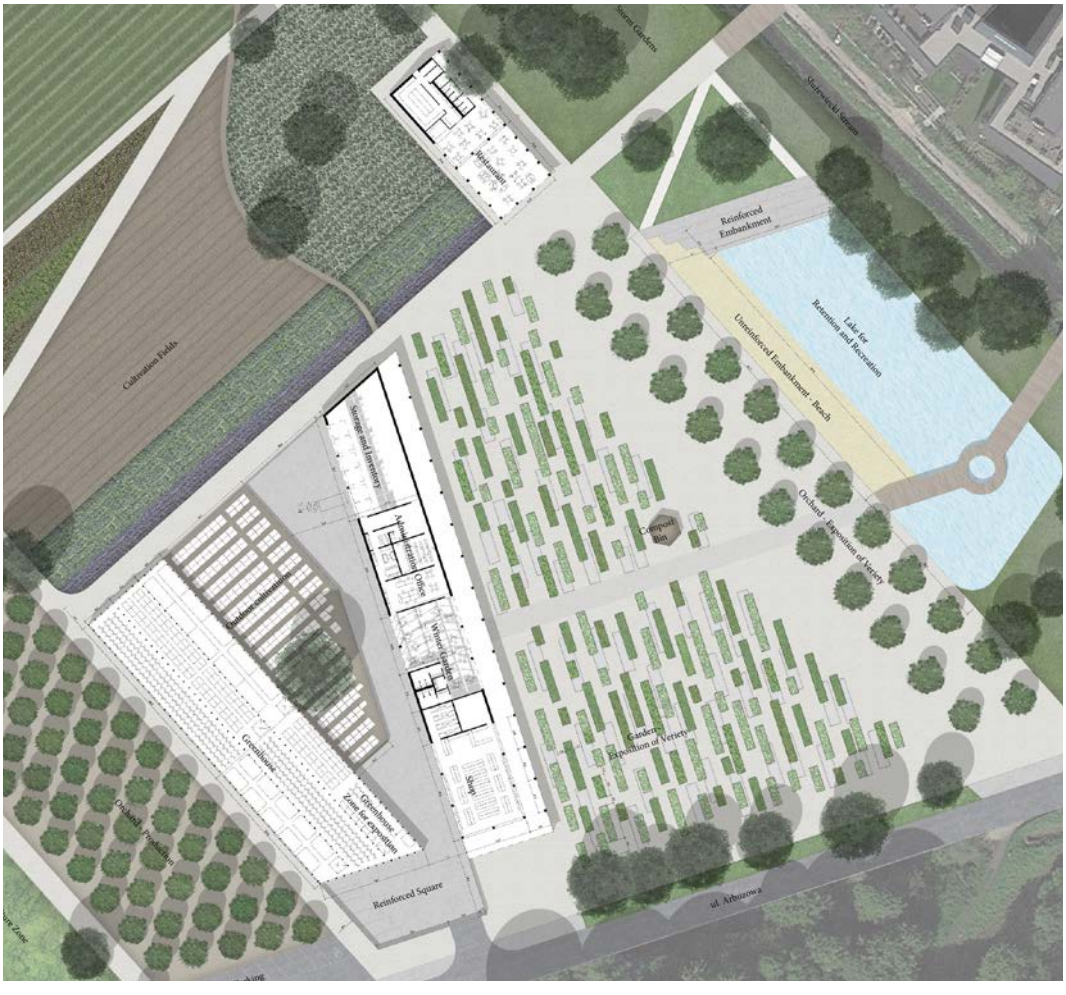
↑ **Urban strategic plan.**

↑ **Ecological layers and strategy plan.**


ANALIZA POWIĄZAŃ URBANISTYCZNYCH POD KĄTEM STWORZENIA
„CIĄGŁEGO PRODUKTYWNEGO KRAJOBRAZU MIEJSKIEGO"



↑ **Urban agriculture typology design** – Illustrations of different typologies.



↑ **Detailed plans of the design proposal.**

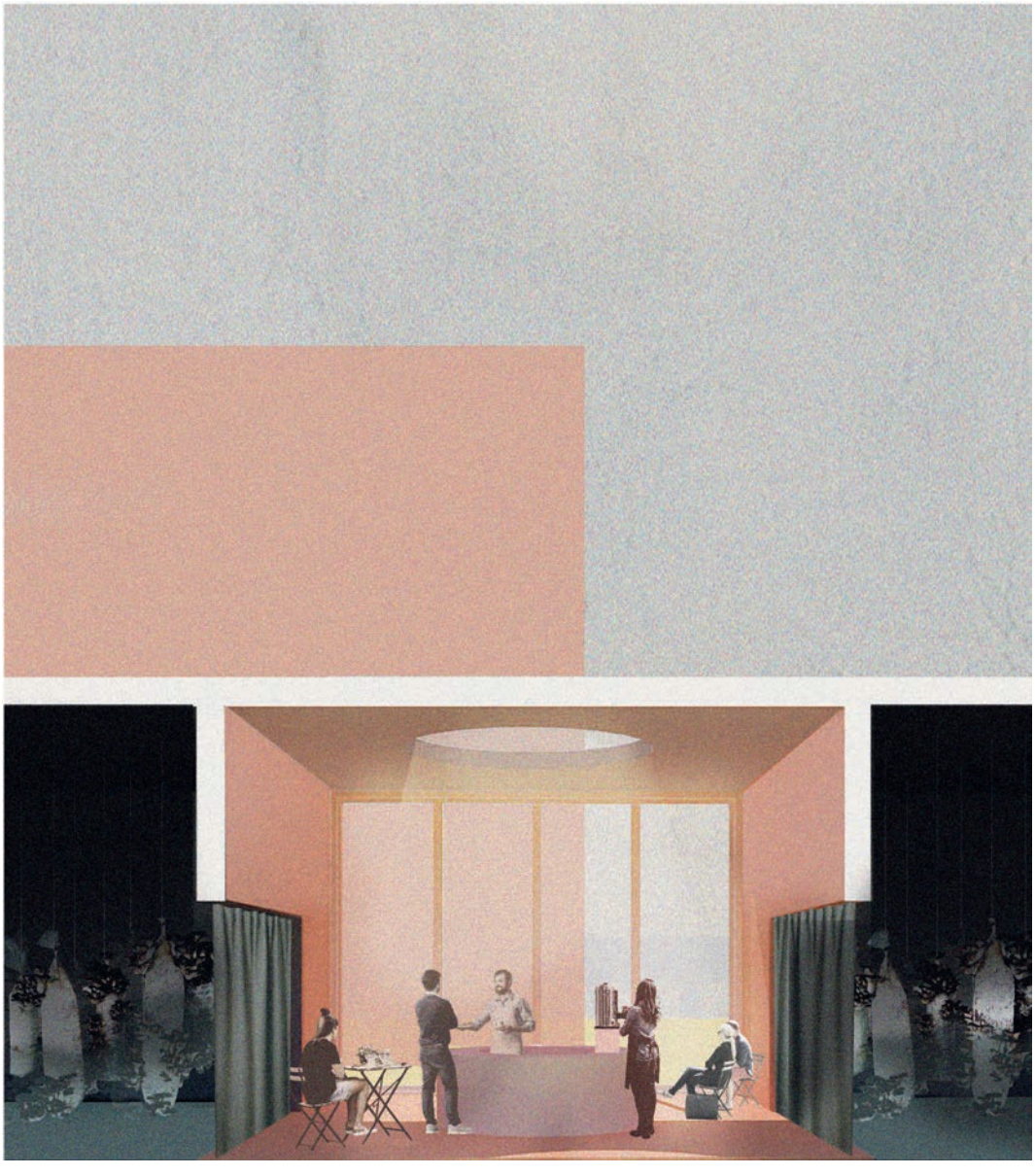
CITY AS AN ECOSYSTEM STRUCTURES FOR IMPROVING THE URBAN METABOLISM WITH A CITY BLOCK AS A MODEL EXAMPLE —

Sylwia Rebelo
Master Thesis, Warsaw University of Technology

It is forecasted that the population of cities around the world will continue to increase. This growth is the cause of many ecological problems. The resources of our planet are limited and there might be a need to redefine the structures and processes that shape our cities. The aim of the thesis is to find key points in city ecosystems and respond with solutions which would lead to a biological balance. This analysis examines non-anthropocentric ecosystems that work efficiently and points out characteristic values that make them stable. This juxtaposition of features between the city and ecosystem highlights that the city's metabolism is a linear process. The process of producing goods and managing waste can be improved by replacing it with the circular processes that we can observe in nature. It requires changing the way we build our cities and evaluate the needs of people as consumers. The city block proposed in this thesis is constantly developing to effectively manage matter and energy, assimilating features of natural ecosystems. In order for that to be possible, there needs to be more biodiversity introduced within the city. We can observe significant disproportion, as the city is mainly influenced by humans, who are consumers. To achieve circular processes we need to bring in other types of organisms from the other trophic levels: producers and decomposers. Minimizing unnecessary consumption can be achieved by collaboration of living organisms, due to symbiosis, which brings measurable benefits. Sharing matter and reducing private property might allow for more dynamic resource exchange and more efficient use.

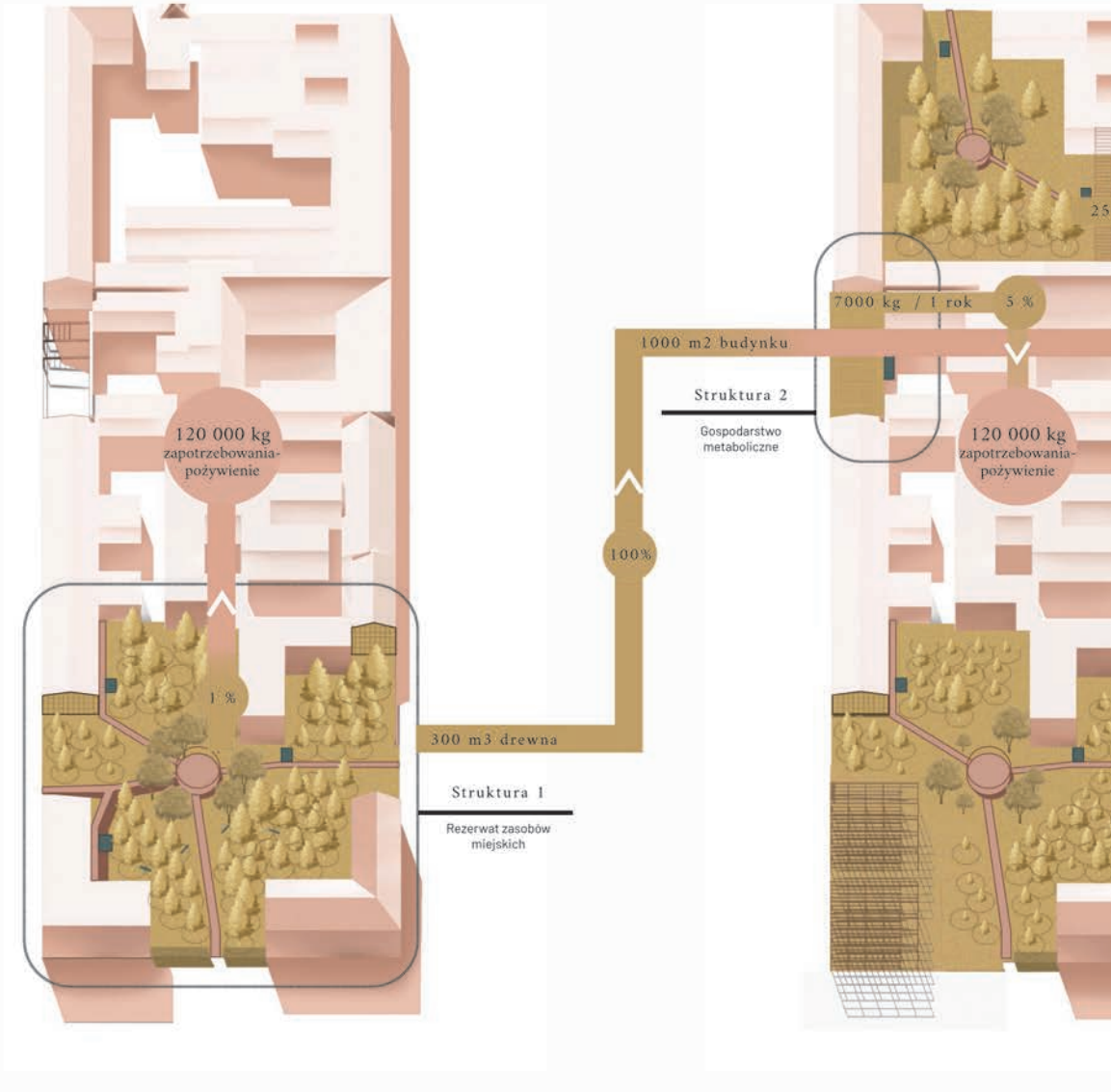
In the ecosystem scale no matter can be considered waste. Waste of one organism can be a valuable resource for another. Treating matter constantly as a valuable resource instead of calling it garbage would allow for efficient management. Circular process cannot occur without changing the perception of matter as equally valuable at various stages of its circulation. Decomposition of matter; the death of organisms should be seen more objectively as one of the phases of the process. This project presents exemplary connections between organisms and shows how they can shape our cities. For example, decomposition of wooden structural elements can fertilize the soil for vegetable farming. Unused plant material can later be decomposed by a fungus and as its vegetative part (called mycelium) grows it can be used as a biodegradable building material. Bodies and forms of living organisms are only snapshots on their timeline of constant change. Due to the fact that the circulation of matter in the ecosystem is continuous, and there is no moment in it more important than others, as there is no final goal, it seems more valuable to design city development processes instead of designing specific, finite forms.

The ideas were tested on an exemplary city block in the center of Warsaw. A variety of typologies was proposed as a wide range of smaller solutions such as: a compost system used to heat up water, fruit trees in public spaces, a hydroponic farm, an underground food storage, and a 3D printing makerspace that uses matter that no longer serves its former function. Later on, these solutions were combined into three different structures to showcase how they work when put together; The Reserve of City Common Resources, The Metabolic farm, and The Symbiotic Life Environment.

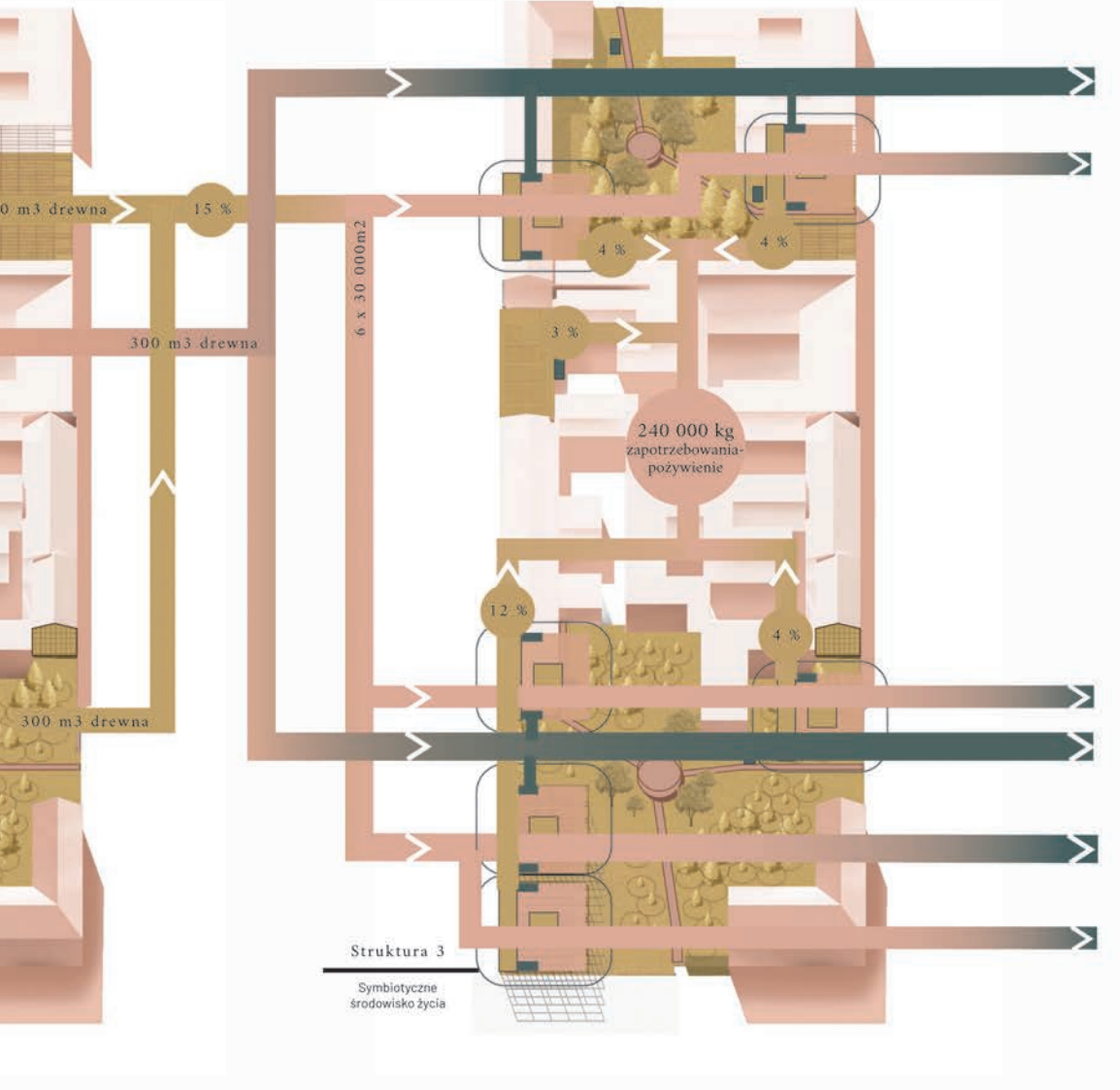


↑ **City block** – Internal view.

↑ **City as ecosystem structure** – Urban metabolism.



City as ecosystem structure – Urban metabolism structure.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300 m3 drewna
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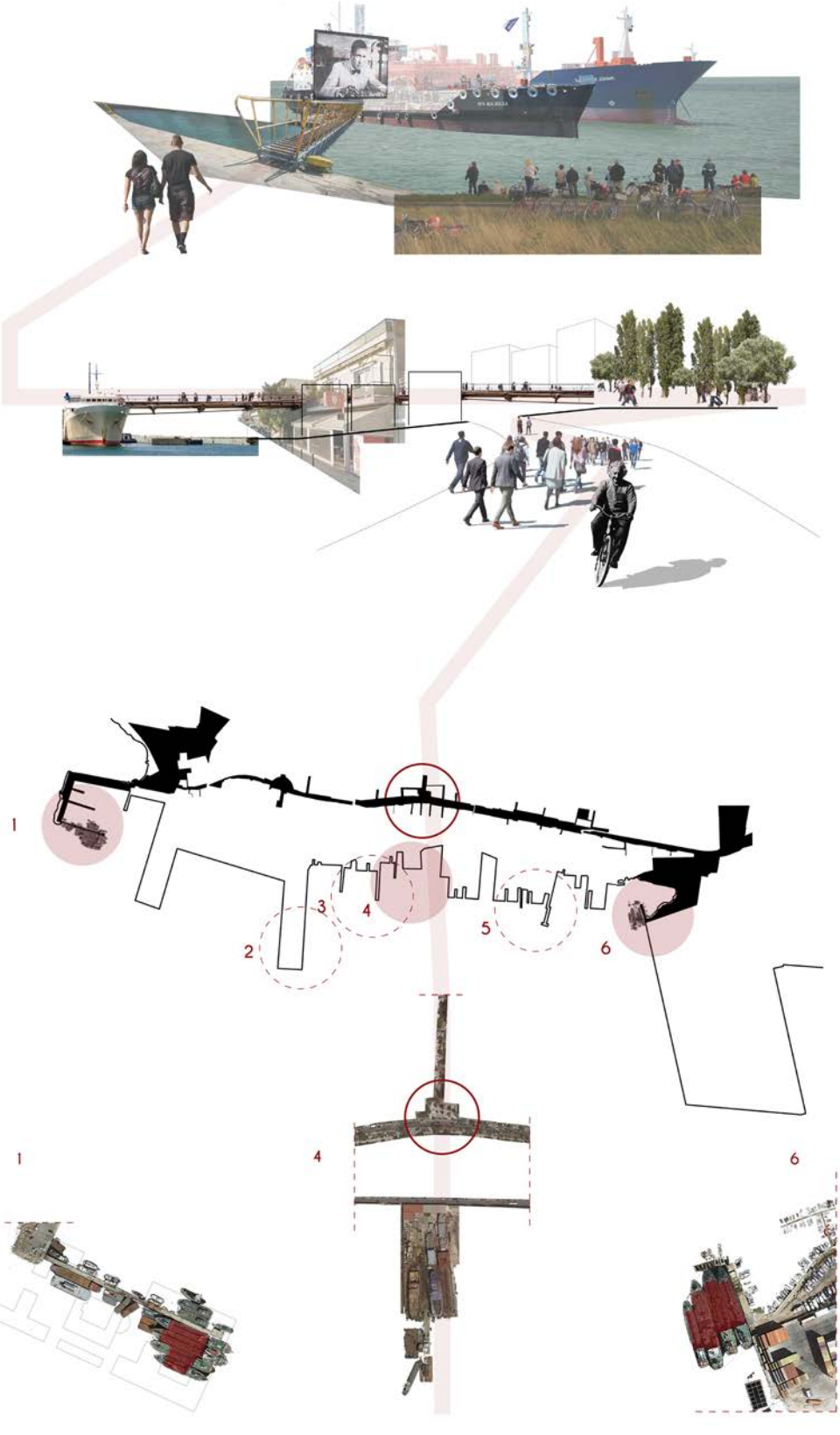
12 %
4 %
Struktura 3
Symbiotyczne
środowisko życia

TOWARDS A RESILIENT PERAMA: IN SEARCH OF LOST SPACE —

Dimitris Loukos
Master Thesis, National Technical University of Athens

This thesis focuses on revealing and decoding the polymorphic urban problems of Perama city, which gradually led the urban fabric to suffer from harsh territorial boundaries, cut off from the natural resources adjacent to it, with high urban density, zoning problems, and lack of infrastructure.
In the wider district of Perama, various non-urban, industrial, and semi-industrial systems raised since the post war era (shipbuilding, merchant port, army, oil activities, etc.) and exploited the existing available resources (natural and non-natural), that is to say, privatized space and local infrastructure. This, combined with long-standing lack of strategic planning and the economic recession of the past decade, led to spatial, socio-economic, and environmental restructuring in a way that was catastrophic for the city. The urban fabric became suffocated due to lack of space, no longer has access to the adjacent sea gulf and Mount Egaleo (vital natural resources), while infrastructure burdened by the extra load became at least inadequate to serve the needs of the city.
The purpose of this thesis is not a spatial re-arrangement to help the above urban and non-urban systems to co-operate or simply exist together, but rather the search for the 'lost space' which is at time the most needed resource for the city's environment, socio-economic life, and spatial transformation. The term 'search' is used here because the main intention lies more in finding and activating this space rather than design it per se. Strategic interventions attempt to re-access the urban fabric to the sea front and the Mount Aegaleo, while at the same time through the 'rapture' of intense urban density a new network of spaces is created that can act as a multidimensional urban stitches and a central platform for hosting and connecting various new possibilities in order to synthesize a resilient city fabric.
This proposed 'transition' of the city to a more open, connected, healthier, and resilient one, consists of four acts:
- the road network decongestion through redesign and new additions;
- the transformation of the central avenue of the city to a linear public pedestrian road that acts as a multilevel transformative factor for the city and hence it's residents;
- the activation of the neuralgic public space network that lies hidden deep in the city fabric and consist of a complex pedestrian network;
- and the revitalization of sea front by regaining access to the sea and exploiting the ship wrecks that lie there.



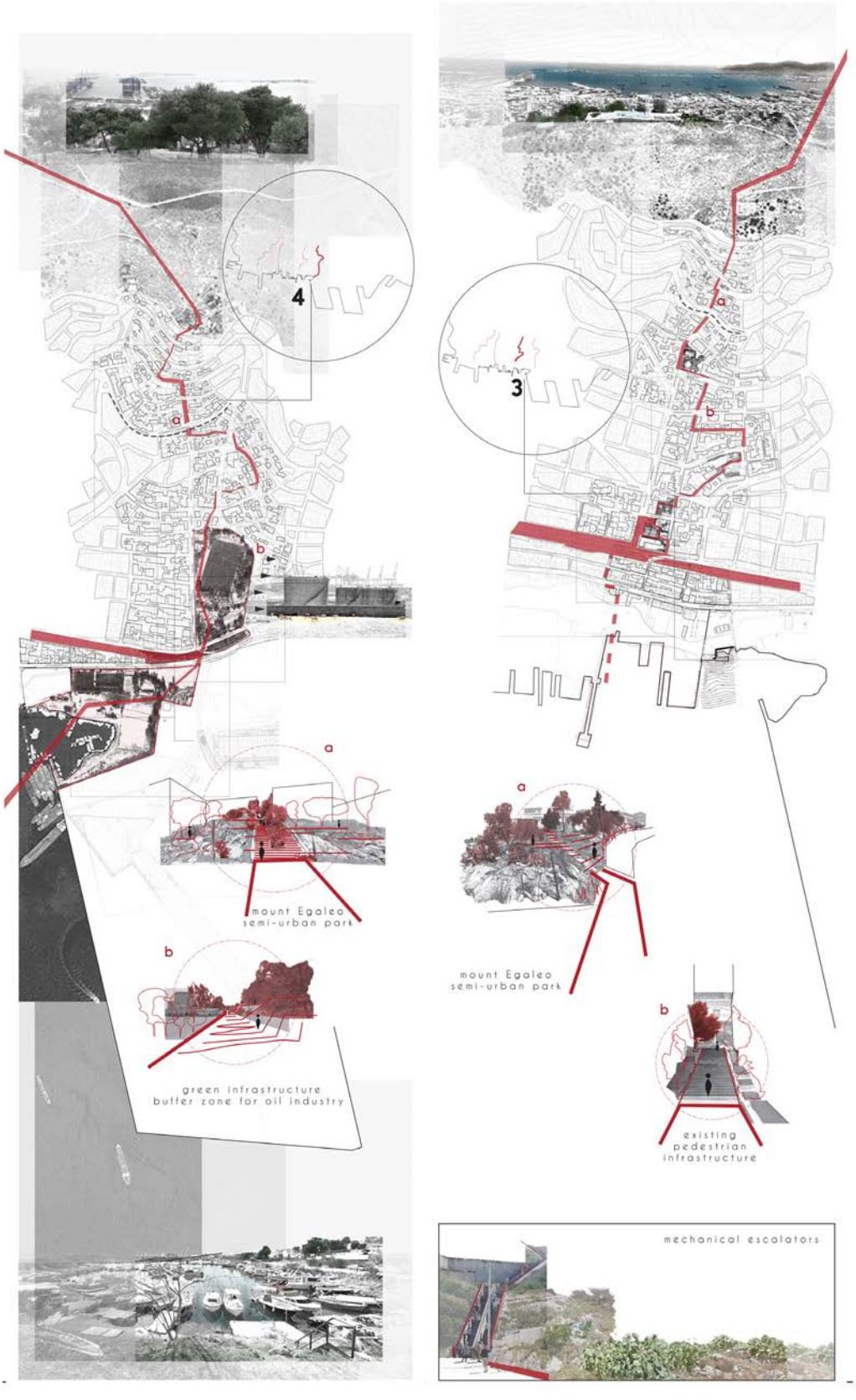
↑ **Lost spaces** – typological research.

↑ **General territorial and urban strategy.**


“rapturing the dense urban fabric with a pedestrian network that acts as urban “stitches”


“revitalizing the sea front by regaining access and exploiting old ship hulls that act as an expansion of the limited space


ARMOS
SITE A
/FISHING PORT


4
a
b
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mount Egaleo
semi-urban park
b
green infrastructure
buffer zone for oil industry
3
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b
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mount Egaleo
semi-urban park
b
existing
pedestrian
infrastructure
mechanical escalators
a
use of mec
escalator
overcoming
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Design proposal – Detailed plans and urban visualization of the urban design proposal.

MITIGATING FRAGMENTATION: THOUGHTS ABOUT RESILIENCE IN THE FORMERLY INDUSTRIAL SUBURB OF DRAPETSONA-KERATSINI, WEST OF PIRAEUS —

Leonidas Christoulis
Master Thesis, National Technical University of Athens

The thesis engages the critical disconnection of the city grid from the coastal landscape within the Keratsini - Drapetsona Municipal boundaries through a design approach that integrates natural, architectural, and urban design parameters and historical, aesthetic, and socio-economic constituents. The key concept is the inherent capacity of the natural environment to carry out several functions and deliver a wide range of policy objectives. Thus the proposed design aspires to transform selected coastal brownfields into an extensive area of multifunctional urban park that restores the long-awaited connection between the city and its waterfront, defining a resilient framework to face environmental and social issues. Our goal is to provide a productive landscape that enhances, conserves, and restores biodiversity, and food provisioning enhances the societal, cultural, and historical link with nature and reduces the vulnerability to natural disaster risks – floods, water scarcity and droughts, coastal erosion.

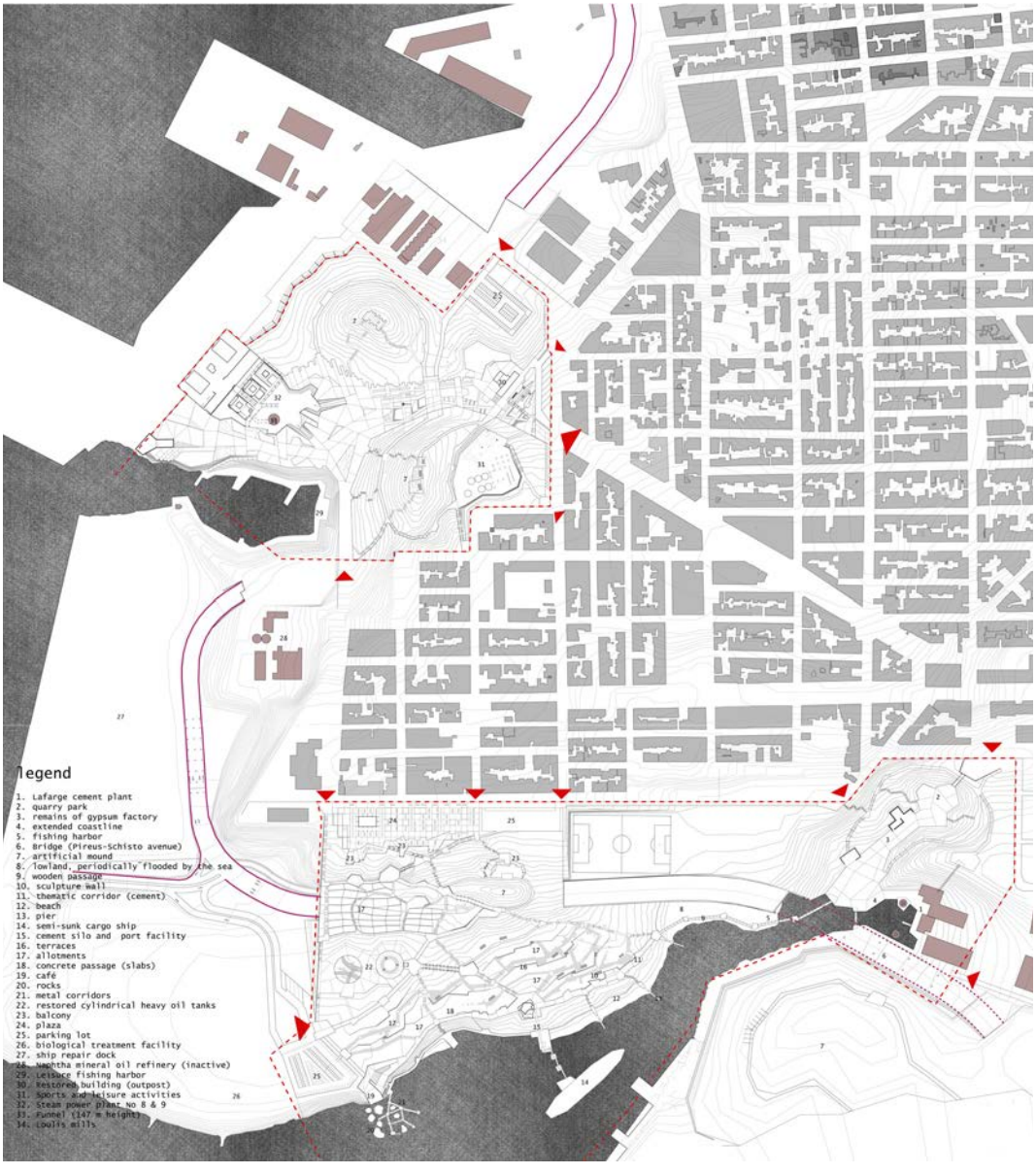
The whole project aspires to become a developmental framework that creates incentives for local stakeholders through public and private investments for RnD, education, community engagement, and fostering local participation. The proposed design interventions employ innovative and cutting-edge methods of recovering landscape and mitigating fragmentation, such as green bridges, in-Situ Capping, and sustainable water management systems. Through a coordinated balance of restoration/reprogramming strategies of the preserved building stock and minimal new building insertions, the proposal connects significant landmarks that evoke collective memories with community gardens, critical viewpoints, and the restored coastline that satisfy the current needs of the local community as well as of the broader metropolitan area.

The proposed design interventions focus on two coastal brownfields neighbouring each other. The first one, split by Piraeus-Schisto avenue, includes the remains of an old gypsum factory, half a dozen of rusty heavy oil tanks (Mobil), a fishing harbour, the port facility of the neighbouring cement factory Lafarge and the central wastewater treatment plant of EYDAP. The second brownfield includes the newly deactivated old steam power plant and its supporting facilities, along with a small fishing harbour. The project layout is articulated in two distinctive parks, one more nature-based with minimal grey surfaces and an urban industrial park.

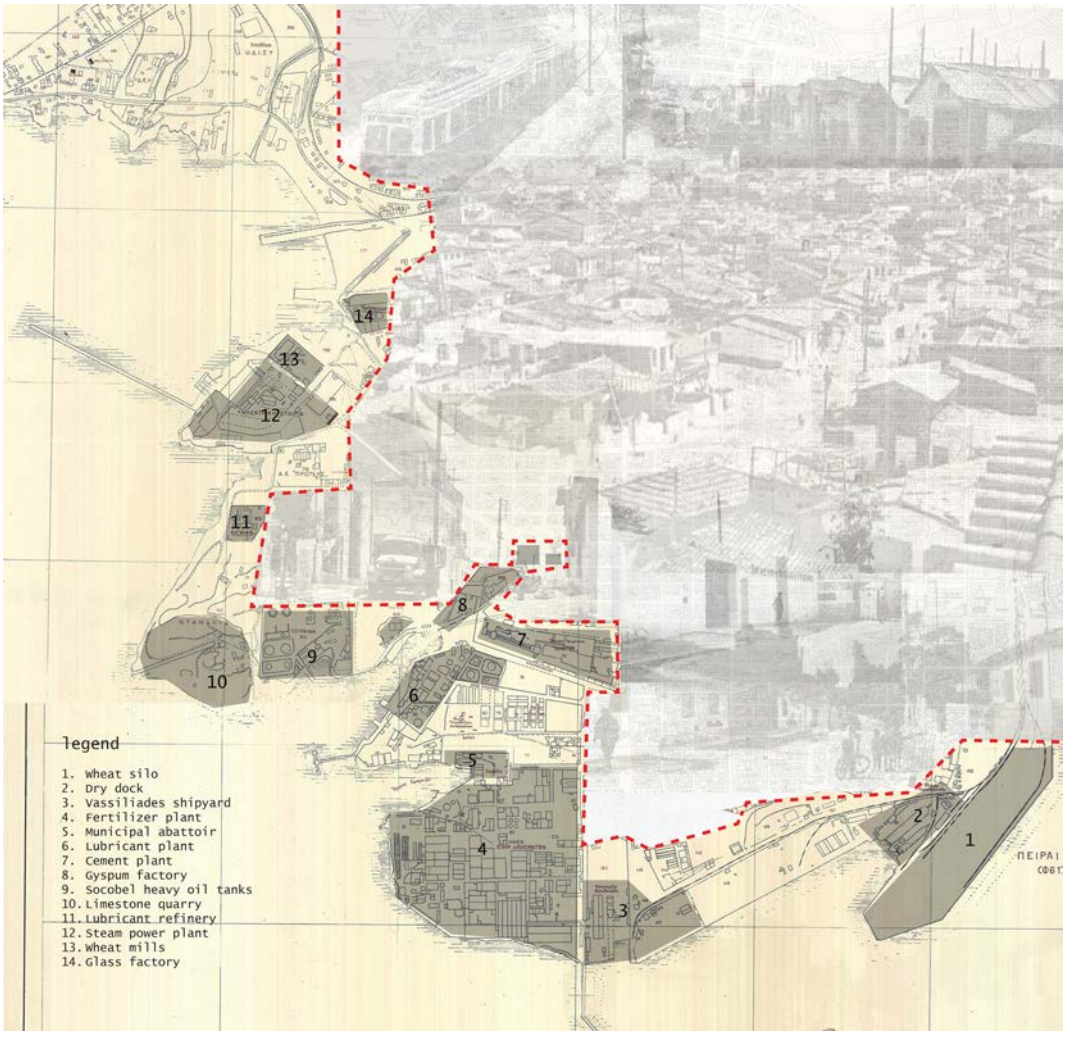
Design concepts on the first site include a major green bridge connecting the park to the residential area, a terraced landscape, and restoring the natural coastline. The terraces allow efficient management of the soil, and they also serve as viewpoints and balconies. Ideal for allotments (community gardens), they can also be the foundations for a sustainable water management system, essential for maintaining a park in a Mediterranean climate. The recovered coastline in its previous state as a beach restores the link between the city and the sea while enhancing the fishing harbour's functionality.

The second park's distinctive layout, reminiscent of a root system, articulates the hybridization of both natural and artificial systems. Starting from Digeni Akrita avenue paves its way between two artificial mounds, widening until it reaches the main plaza, where the mighty steel power plant is located, transformed into an industrial museum.

The thesis also includes ideas to enhance connectivity and integration with the adjacent urban fabric and easy access to the site by private car and public transportation.



↑ **The proposal** – Master plan.

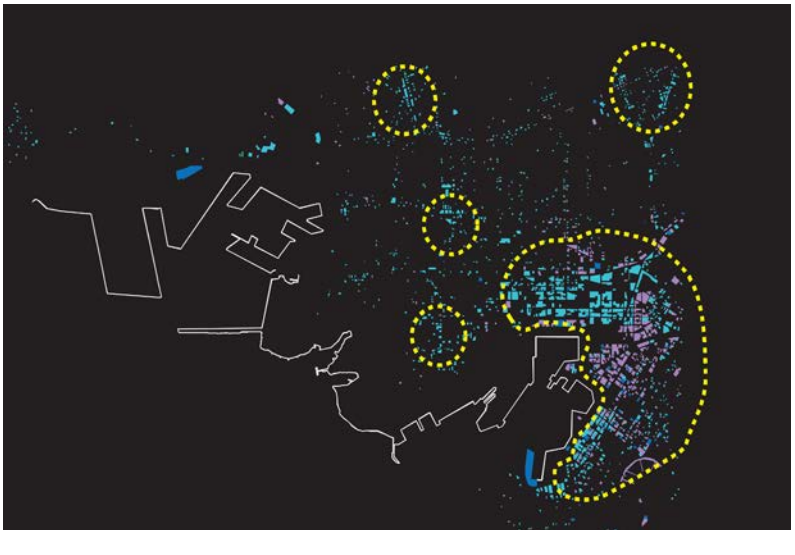


Site analysis – Industry map of Drapetsona-Keratsini -1930.

Site analysis – Industries distribution diagram.

Site analysis – Housing distribution diagram.

Site analysis – Green spaces diagram.

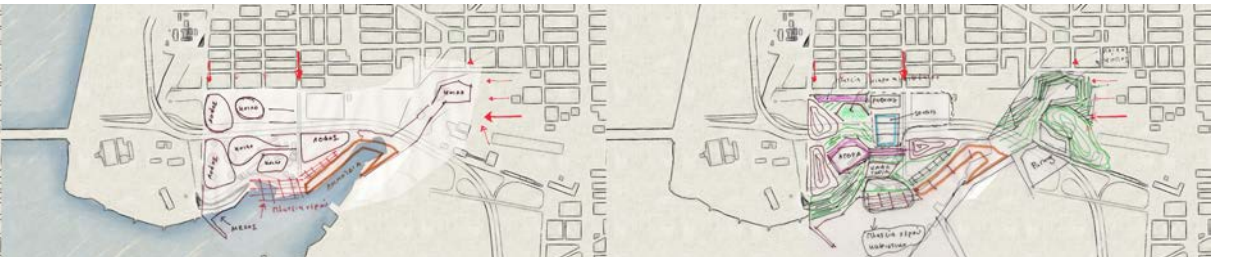


Site analysis – Tertiary sector diagram.

↑ **Thinking of resilience** – Storyboard of power plant site proposal.

↑ **Thinking of resilience** – Storyboard of fuel tanks-cement plant site proposal.

↑ **The proposal** – Site layout plan, oil tanks-cement plant site.



↑ **The proposal** – site layout plan, power plant site.

THE REVOLUTION HAS ALREADY BEGUN! BUT WE SHOULD NOT STOP SEARCHING FOR BEAUTY

Marco Bovati

Reflecting on the theme of ecological transition and the consequent innovation of disciplinary strategies, we are faced with the urgency of a profound rethinking of the objectives and tools used for the design and construction of architectural and urban space, so that they can have a genuine impact on the spatial dimension and on the quality of urban environment. This rethinking is driven by a true emergency, which can no longer be shelved, and must be organised according to new skills and new values, rooted in established practices, but at the same time capable of radically renewing them from within. This same rethinking must also take into account the environmental, economic, social and spatial fragility of many urban and regional contexts affected by natural disasters or the effects of the expansive urbanisation practices of recent decades. Finally, it is a rethinking that must be implemented with full understanding of its necessity and irreversibility, intensified by the health emergency and the need to open a Green New Deal in human history.

The revolution has already begun! We are now familiar with concepts such as circular economy, adaptation, resilience, systemic transition, reuse and recycling, compactness, reduction of impacts, and these are being translated into operational tools, as variations of the more general idea of sustainability. But before rushing headlong into the future at full speed, running the risk of repeating mistakes already made in the past – think for example of how certain building practices responded to the energy problem in the 1970s, proposing the construction of buildings and environments that were completely sealed, energy efficient, but totally unhealthy and unsanitary for the occupants – we should focus our attention for a moment and question ourselves critically about the actions and choices we are about to make, also in the light of a critical analysis of the recent past.
First of all, we need to ask ourselves some serious questions about the causes of the environmental emergency, to avoid repeating some of the misinterpretations made in the past and to truly understand the real role of the actors and factors involved. We also need to investigate the effects that our choices will have (and are already

starting to have) on the spatial dimension and the quality of urban environment. Finally, an attempt should be made to understand the role that the tool of architectural and urban design can play in this new framework, as part of the strategy for dealing with the emergency.

Jared Diamond – the well-known American anthropologist, historian and biologist – in his book titled *Collapse: How Societies Choose to Fail or Survive* (2005), describes a series of societal collapses, in the history of mankind, to which environmental problems contribute. The author's analysis is conducted according to the comparative method, comparing situations where different environmental fragilities are present and seeking to understand and interpret the causes of the collapse and disappearance of entire communities, often populous and rich (e.g. Easter Island society, the Anasazi of North America, The Polynesians of Pitcairn Island and others).
Among the causes, the role of poor choices in terms of management of the environmental heritage, collection and use of natural resources emerges, choices often strongly conditioned by economic reasons and the pursuit of profit.
Contrary to popular belief, this book teaches us that it is not progress, excessive technology or even industrialisation that are the sole causes of environmental crises, but rather the policy choices in terms of land management, resource exploitation and respect for environmental balances, which, if wrongly thought through, lead to catastrophe. This is borne out by Diamond's interpretation, which goes as far back as observing communities employing apparently non-destructive technologies in contexts where the weight of the technological component was certainly less than in the recent centuries. It is a matter of choices in which technology and progress enter as major players, which may or may not play a negative role, depending on the use made of them.

In our disciplines, many of the choices that can be made relate to the practice of design which, in the light of this, must always be attentive to ecosystem balances and increasingly aware of the dynamics that it can determine or hinder. Favouring positions that tend towards the rejection of technology, in the name of a supposed naturalism or return to basics, is not necessarily a sign of greater sustainability. There are no easy formulas according to which the equation technology = environmental disaster is proven to be always valid. Careful consideration must be given to the type and quantity of resources employed, as well as the way in which they are used, remembering that – as in the case of good architecture – these choices cannot preclude an interpretation of the relationship with

the context and the territory in which they operate.
The rethinking of the objectives and tools for transforming urban space, and in particular the practice of design, must also take place in the light of new shared values, but what are these values?
In 2013, during a lecture held in Bergamo as part of the *Azioni Urbane* project workshop, Carlos Arroyo (a Spanish architect who has been experimenting with sustainable solutions for architecture for years) said: «According to a certain idea of sustainability, the most sustainable thing we can do is to become very bored and die as soon as possible» That 'certain idea of sustainability' to which Arroyo referred is an idea of sustainability as renunciation, as impoverishment, as limitation and closure, as a downward compromise (I do as little as possible so I don't pollute, I die early so I reduce my ecological footprint). This idea is not far removed from certain practices that also affect the profession of architect, according to which the need to comply with energy-saving standards and reduce the resources used must inevitably translate into the idea of a constraint that leads to a loss of quality in architecture itself, a loss determined by the need to compromise with other, stronger reasons that seem to limit the quest for quality.

But why a constraint should necessarily result in a loss of quality is neither clear nor obvious. No one would dream of claiming that the need to respect the structural constraints of construction, the constraints of health and hygiene regulations or urban planning constraints on size, volume and distances, constitutes a limit to the quality of the project. The idea that environmental limits are actually a downward compromise, as seems to be implicit in that 'certain idea of sustainability', and the acceptance of this, shows that the design culture has not yet fully introduced the issue of sustainability into its values, principles and practices, and that there is still much work to be done on this.

This is not to say that we should not limit our consumption and curb certain excesses of the recent past, but that sobriety in our choices and behaviour is a fundamental principle that cannot be renounced, even for design practices. But that idea of sustainability as renunciation, for example, contrasts with the mechanisms of nature, which we so often claim to want to understand and imitate, one of which is the redundancy of natural systems, as emphasised by Darwin and specified by Stephen Jay Gould. According to this principle, nature does not limit its production, on the contrary, nature produces more than what is needed, but the surplus, the redundancy, is constantly reabsorbed by the cyclical nature of the processes that enhances its role through the re-use as food for other processes, or – as underlined by Gould – through adaptation to other functions, the famous Gould metaphor of the panda's thumb (Gould 1980), and the metaphor of the cherry blossom, cited by

McDonough and Braungart (2002) help us to clarify the matter. Our task is therefore to embrace the new demands dictated by the environmental and climate emergency, continuing to believe in the possibility of building quality architecture and cities, and continuing to work towards a harmonious coexistence between human beings and the natural environment. To use a word that is sometimes a little alarming, but which we should re-appropriate, we must not stop looking for beauty even in the changed conditions of these times of transition.

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Diamond, Jared. 2005. *Collapse: How Societies Choose to Fail or Survive*. New York: Viking Press.

Gould, Stephen Jay. 1980. *The Panda's Thumb*. New York: W. W. Norton.

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Beyond the urgency of rethinking XX century urbanization characterized by the strategy of an endless structural expansion, we need to engage urban systems by means of emerging concepts of adaptability and systemic transitions due to climate change effects. Emission reduction and spatial compactness, reuse and recycle, flexibility and complex balances have a profound impact on the spatial dimension and the quality of urban environment, therefore architectural and urban design are deeply involved in facing ecological transitions and envisioning new strategies to implement the quality of the cities we live in.

How to face these emergent challenges? What are the ongoing design strategies to climate change effects? what will be the role of design in transitional systems? Do we recognize it as an opportunity for the improvement of the public space? Design Actions for Shifting Condition is a collaborative effort, and aims to present, from an architectural and urban design point of view, methodologies, practices and approaches to overcome existing and new fragilities for Cities in Times of Transition.

— The Editors