WASTESCAPE REGENERATION

Values, approaches and tools to operationalise circular city models

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This thesis presents some of the results developed during the PhD course between UNINA and TU Delft.
During the years of research the candidate also explored some lines of research that turned out to be dead ends.
The unexpected course of events due to COVID-19 changed part of the work.

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Summary

Acronyms and Abbreviations

ANP	Analytic Network Process
AS-MFA	Activity-based Spatial Material Flow Analysis
BE	Built Environment
CE	Circular Economy
CC	Circular City
CDW	Construction and Demolition Waste
DSS	Decision Support System
EJ	Environmental Justice
GDSE	Geodesign Decision Support Environment
PULL	Peri-Urban Living Labs
MBT	Mechanical Biological Treatment
MCDA	Multiple Criteria Decision Analysis
MCDM	Multiple Criteria Decision Method
MAA	Multi Actor Approach
MSW	Municipal Solid Waste
OW	Organic Waste
NAIADE	Novel Approach to Imprecise Assessment
UM	Urban Metabolism
RSW	Residual Solid Waste
S-MCE	Social Multiple Criteria Evaluation
SDGs	Sustainable Development Goals

List of Tables

List of Figures

List of Photos

Abstract

This research investigates the wastescapes and their regeneration in urban contexts, presenting a deepening of the definition and an evaluation framework for a collaborative regeneration process.
Because of the concept of waste, the wastescape is deemed as a multidimensional cultural landscape, constituted of discarded parts of metabolic resources, areas, built environment, society, and others systems of waste. Thus, it is composed of various multidimensional waste systems interplaying at different scales. In this sense, a wastescape is not only limited to a spatial domain. The urban physiology and morphology of the Netzstadt framework let define the urban systems of wastescape; mainly, metabolic processes and the built environment are explored in this research, and values, tools and methods to support regenerative processes in the frame of the circular city.
Circular economy (CE) is becoming a global challenge to implement regenerative urban strategies in the context of sustainability transition.
Urban metabolism of waste, waste architecture, and urban communities are the constituent systems considered in this study. Each one has different scales of analysis. While the urban metabolism is analysed at a big scale, the wasted architecture and urban community role are observed locally. The two scales reveal complementary issues and opportunities for the regeneration processes toward circular cities.
This, the evaluation of an urban wastescape, as multidimentional cultural landscape, consider environmental, social, economic and cultural dimensions. In this perspective, the urban landscape services can be the benchmarks for quantitative and qualitative analyses of the evaluation of the performances.
In the circular city frame, policies and projects are oriented to collaboration of multiple stakeholders and local actors. In this way, urban wastescape regeneration considers social equity and environmental justice in its fundamentals. In this path, the thesis expore both materials and methods of wastescape regeneration.
In such urban policies, spatial decision-making support systems allow at managing multidimensional and multi-actor evaluation processes. At different scales, the Geodesign method and multiple criteria decision analysis (MCDAs) are tested in two case studies.
The case studies present two different wastescape analyses at two different scales, considering some relevant physiological and morphological aspects.
The first case study analyses the Naples urban metabolism of waste in the REPAiR project. Starting from the CE principle that consider waste as resource for sustainable development, resource management is at the center of the REPAiR project research. In the Naples case, the Activity-based Spatial Material Flow Analysis (AS-MFA) map the organic waste and construction and demolition waste streams on the territory. From this *wastescape* status quo, the Geodesign Decision Support Environment supports the co-creation of circular economy strategies. It is a collaborative decision-making process, from knowledge to negotiation phase. Wuthout deepen in the morphological aspects, the AS_MFA maps and the geodesign method represent the two innovative tools for urban wastescape regenerations in a collaborative decision-making process.
On a smaller scale, two cases of modern marginal neighbourhoods in Naples and Amsterdam show the social and spatial issues of wastescape of wasted architectures and marginal communities. In these cases, the urban morphological conditions produced urban wastescape physiological conditions. Similar circumstances and different events lead to two regeneration processes compared at the end of the section. The most significant transformations happened through architecture, public policies and communities of place and communities of practice. The demolition and adaptive reuse of modern architectures changed some environmental perceptions that led to the rejection of the place. The intense bottom-up actions and community actions made urban social regeneration over the years. Rejection, exclusion, cultural stigma, and prejudice made the neighbourhood as urban wastescapes.
The three cases study explore values, approaches and tools for wastescape regeneration at two different scales. They are part of the same approach to circularity.
The cases show that circular economy in urban areas come up against two main issues: legal and cultural. Environmental and economic issues stem from those. The available techniques and technologies in waste management can be improved, but many are already available and underused. Any kind of waste in urban areas is currently a problem, creating blighted areas and disamenities.
Together with actors and stakeholders, the thesis show how communities of place and practices are the core of long term sustainable transformations. In this path, circularity is the economic approach and collaborative decision-making processes can ensure transparency and the inclusion of actors, stakeholders and local groups in the transition to the circular city.

PART I
Definition of the problem, aims and methodology

Premise

Jim not that way Jim. That's no way to treat a garage door, bending stiffly down at the waist and yanking at the handle so the door jerks up and out jerky and hard and you crack your shins and my ruined knees, son. Let's see you bend at the healthy knees. Let's see you hook a soft hand lightly over the handle feeling its subtle grain and pull just as exactly gently as will make it come to you. Experiment, Jim. See how much force you need to start the door easy, let il roll out open its hidden greasy rollers and pulleys in the ceiling's set of spiderwebbed beams.

David Foster Wallace, 1996. Infine Jest

"I'll tell you what I see here, Sims. The scenery of the future. Eventually the only scenery left. The more toxic the waste, the greater the effort and expense a tourist will be willing to tolerate in order to visit the site. Only I don't think you ought to be isolating these sites. Isolate the most toxic waste, okay. This makes it grander, more ominous and magical. But basic household waste ought to be placed in the cities that produce it. Bring garbage into the open. Let people see it and respect it. Don't hide your waste facilities. Make an architecture of waste. Design gorgeous buildings to recycle waste and invite people to collect their own garbage and bring it with them to the press rams and conveyors. Get to know waste, the nuclear waste, this become a remote landscape of nostalgia. Bus, tours and postcards, I guarantee it. Sims wasn't sure he linked this. "What kind of nostalgia?" "Don't underestimate our capacity for complex longings. Nostalgia for the banned materials of civilization, for the brute force of old industries and old conflicts."

Don DeLillo, 1997. Underworld

The American novelists David Foster Wallace and Don DeLillo narrate two contemporary attitudes belonging to our relationship with small and big things: The absence of care and the nostalgic and irrational links with toxic relationships.
Over the last decades, grassroots movements and theorists placed against the tide of environmental depletion.
Nowadays, European public policies are working to promote and accelerate approaches in sustainability transition at different scales in all the knowledge fields.
The present research is a contribution in this direction.

1 INTRODUCTION

Photo 1. Storage of aggregates from bottom ash separation at Acerra incinerator. Dec 7, 2017. Photo of the author.

Introduction

This research deals with the concept of **waste**, investigating how it displays in our urban areas and what kind of values, approaches and tools can steer a regeneration process.

Armiero (2021) says *waste can be considered the planetary mark of our new epoch*. it is present in every sphere of the contemporary world. Every small daily action produces it. Every creative act involves the formation of waste. All cultures of all ages have always made it.

While in nature, the waste produced by one process becomes food for another, human society has increased the accumulation of garbage over time.

The waste production process strongly increased since the industrial revolution. The first solid waste management system appeared in London in the late 18th century (Barles, 2014). Still today, wastes are primarily produced in cities and urbanized areas. Urban waste is an output of each activity of urban metabolic processes. Input and output resource flows that pass through urban areas make cities be ecosystem parasites.

Our cities and lifestyle are responsible for the most of critical conditions of ecosystem depletion. From the global to the very local scale, the ecosystem functions in the interplaying of multiple sub-systems. Human action on the ecosystem has become as strong as that of nature itself. Natural environment, economic processes, social relations, cultural contexts, built environment and much more interact as one single system. Cities themselves function like constellations of networks interconnected by other different networks (Batty, 2018). In these dynamics, waste are produced at all stages.

The widespread environmental crisis of recent decades has led to the definition of European plans and agendas to adopt policies for a sustainability transition (Köhler et al., 2019). Even if the attention toward the future of rural and countryside is increasing, also among architects (AMO & Koolhaas, 2020), big cities are still growing and are at the hearth of most significant contemporary changes. In fact, human settlements act as catalysts for creativity and innovation across the EU. Anyhow, they are also places where various persistent environmental and social problems reach the most worrying levels. Cities are the places that provide the cause of most of today's global challenges but are also the places where human beings can make a difference to create innovative solutions. For this purpose, enabling conditions for sustainability transition need radical policies and programs to turn the existing problems into new opportunities. Researchers, administrators and practitioners are theoretically share a new ecological approach to urban planning and design.

This research focuses on the multidimensional problems of waste in urban areas. Waste is a major contemporary problem.

The world generates 2.01 billion tonnes of municipal solid waste annually, with at least 33 percent of that—extremely conservatively—not managed in an environmentally safe manner. Worldwide, waste generated per person per day averages 0.74 kilogram but ranges widely, from 0.11 to 4.54 kilograms. Though they only account for 16 percent of the world's population, high-income countries generate about 34 percent, or 683 million tonnes, of the world's waste (The World Bank, 2021).

To move in the improvement of resource management, the paradigm of Circular Economy is developing worldwide. However, just 8,6% of the global economy is *circular*, which is also down from the 9.1% of 2018 (Circle Economy, 2021).

However, the transition from theory to daily practice requires much effort and new tools to overcome the many barriers between academic and concrete needs. Waste must be reduced and become the resource of tomorrow. Cities and peri-urban areas must be healthy places to live in. From this point of view, urban ecology is deeply related to other environmental research fields and ecosystem services studies (Costanza et al., 1997; Millennium Ecosystem Assessment, 2005). Several hybrid disciplines arose from the integration of Ecology with other areas (Fig.1) (de Molina & Toledo, 2014).

The new ecological approach's roots can be found in 1970 when the Council of Europe proclaimed the first "European Year for Nature Conservation". Two years later, the United Nations announced the first major world conference on the human environment. It was the world debut of the concept of Ecology.

The term was baptised in 1866 by the German biologist Ernst Haeckel to call an autonomous discipline, functional to divulge Darwinian discoveries, to describe the influence that the environment has on living beings, with particular attention to the different mutual interactions.

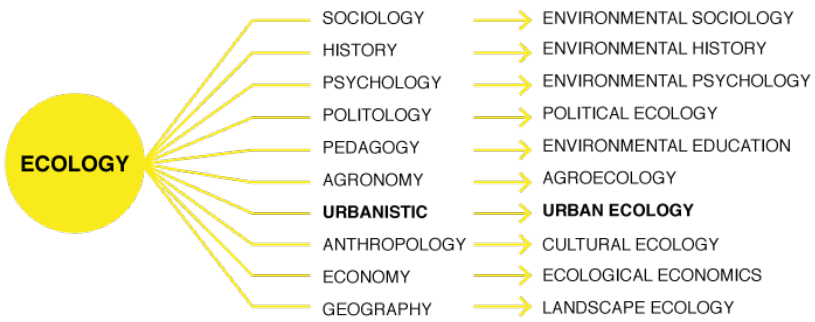

Figure 1. Urban Ecology: one of the disciplines resulting from integrating biological ecology with other areas of knowledge (adapted from de Molina & Toledo, 2014).

The nineteenth-century had been an artistically fruitful period to pave the way for ecological wisdom, with Goethe's organicist thought, German romantic poetry (Holderlin, Novalis) and English (Blake, Shelley, Keats) and Lamark's new visions of biology and Darwin (Valle, 2011) among others. The study of Ecology, which began between the late nineteenth and early twentieth centuries, had its first great resonance during the Second World War with the biologist Commoner's contestation against the radioactive pollution produced by the explosion of nuclear bombs.

Ecological dynamics are not an atopic matter. Natural and anthropic systems compose urban ecosystems as places where natural and social capital meet (Costanza, 2012).

Odum (1971) stated that Ecology is not just a biological but a human science.

The relationship between man and nature in the western world has been complex and mainly anthropocentric. The concept of ecosophy and deep ecology started to subvert the anthropocentric perspective (Næs, 1990), favouring a systemic vision of men as part of the whole ecosystem. The deep ecology view overcame anthropocentrism's divisive duality with a holistic conception of the whole as a composition of multiple parts interplaying in interactions. The characteristics of the deep ecology movement are interesting for this study because it recognises the inherent value of all living beings and uses this view in shaping environmental policies (Næs & Session, 1984). The renewed spiritual awareness of all phenomena interdependence focuses on several research strands, also connecting far cultures and different scales (Capra & Luisi, 2014).

During the seventies' protest movements, the ideas about overcoming dualities and anthropocentric attitude were accepted and spread across the hippy movement to all culture and research fields. In architecture, for example, the Italian radical group 9999 pursued an architecture bounded to social and environmental sustainability ideas. Later, Guattari systemised the relationship between the individual and the production of his subjective, economic and social realities. The natural environment in a single organic discourse links the three dimensions of mental, social and environmental ecology (Guattari, 2005).

The tension between mechanism and holism has been present throughout Western thought history. When the perspective reappears in 20th-century culture, it becomes *systemic thinking* (Hester & Adams, 2014; Richmond, 1991; Ackoff, 1971). Currently, urban studies broadly consider systemic thinking, and also, the waste phenomenon can be studied in this perspective.

The systemic view of life and ecosystems starts from observing an organism in its totality. In the multidisciplinary research of Bateson (Bateson, 1984; Bateson, 2000), the systemic vision is intrinsic in the investigation of the relationships of all the components of reality. Bateson tried to identify the

structure that connects all the constituents of reality, such as variants and local manifestations of the same ecosystem of ideas. Thus, the *Ecology of the mind* is a new ecological approach to thinking about the rapport between organism and environment. According to Bateson's systematic ecological conception, it is impossible to separate the individual and his environment. His theoretical production aimed at creating new parameters to orient the knowledge theory. These parameters established a new relationship between organism and environment. They are based on the flexibility of action patterns that define organisms' behaviour among themselves and with the ecosystem they occupy. Indeed, Bateson believes that ideas are, in some sense, living beings, subject to a peculiar natural selection and economic laws regulating and limiting their multiplication within some areas of the mind. The significance of the systemic vision in environmental management encompasses all human activities, from industry to agriculture (Seiffert & Loch, 2005).

In the vision of deep ecology, identifying the Ego with Nature is necessary to protect ourselves. Nature's concept as a place of goods and source of sustenance has always belonged to all living beings. The scientific identification of nature services, i.e., ecosystem services, began in the 1970s (Gómez-Baggethun, De Groot, Lomas, & Montes, 2010). Together with the start of the environmental crisis, the spread of ecological awareness. The first definition of "nature's services" (Westman, 1977) was the first expression to give a shared value to heritage at risk.

Downstream of this cultural legacy, the current ecological emergency is a material and immaterial tangible datum. The radical change in the economy and lifestyles guided by the dominant techno-capitalist economic models has become necessary. As a pure source of supply, Nature's dualistic and instrumental conception is no longer sustainable. The National Footprint Accounts (NFAs) calculate the Earth's supply capacity concerning the growing human demand for resources and services (Borucke et al., 2013). The ecological deficit occurs when the Ecological Footprint of a population exceeds the area's biocapacity available to that population. The ecological deficit implies the import of biocapacity, the depletion of the national ecological heritage or the excessive emission of atmospheric pollutants. Ecological Footprint is also studied affecting ecosystem services (Mancini et al., 2018).

In this context, the idea of the city as an independent entity no longer exists; it is part of a connected and globalised world (Perulli, 2014). The changes necessary to rebalance the ecological deficit and the related economic, environmental and social inequities are recognised and promoted by the United Nations (U.N., 1948). However, they would require radical economic and political choices.

The European Union has environmental protection in its fundamental principles (Article 3 of the Treaty on European Union, 2012). A recent EEA briefing, 'Growth without economic growth' (EEA, 2021), also presents an overview of the various ideas about progress beyond economic growth and new forms of economy.

Nowadays, in this context, the Circular Economy is recognised and strongly promoted by the Commission. It seems to guarantee significant environmental benefits without changing the status quo radically. The circular economy moves from the primary goal of reducing, reusing, and recycling waste, improving and connecting many supply chains, creating values, and reducing environmental impacts.

Waste is a global substantial environmental problem, whose impact also generates many environmental injustices (Martuzzi, Mitis & Forastiere, 2010). The study of waste streams is part of Urban Metabolism researches (Zhang, 2013; Barles, 2010; Girardet, 1990; Cleveland, Costanza, Hall & Kaufmann, 1984). Water, energy and commodities of urban metabolism involve multiple processes at different scales that define multiple dimensions of urban identity and well-being. Improved management of urban resources and waste can be an asset for the sustainability transition toward a circular economy and circular city models.

This transition consists of more rational use of resources and a cultural paradigm shift in the understanding, production, and management of resources. In the metabolic perspective, building stock and public spaces are resources at stake and nature, commodities, human capital and waste streams.

Architecture and cities born to defend man from the threats of nature have now become a threat to the natural ecosystems on which they depend. The built environment, commodities, goods, society, transports, energy, production methods, and civic participation are all actors in the evolving metropolis (Ratti, 2017).
Based on these background, the thesis seeks to articulate wastescapes as a cultural landscape of multiple waste phenomena starting from the assumption that waste can be the future resource of circular cities.

1.1 Situating the study within the urban studies

Wastescape is a brand-new research strand in urban studies.
The topic of waste lands has emerged since the middle of the last century. Waste management as a component of urban metabolism has been investigated in urban settings since the late 1960s. Since the environmental problems due to human impacts have become more serious, the concepts of resources and impacts have taken on new importance in urban studies. Therefore, urban metabolism has become a topic of interest for all those actors involved in sustainable planning and design, both at the territorial and local scale. In this context, the study of waste is a key to addressing the urban regeneration issues-oriented to a circular city model (EMF, 2019; Williams, 2019; Thomson & Newman, 2018; Kennedy, Cuddihy & Engel-Yan, 2007).
The historical ecological approach to sustainable development and current transition, as the background of contemporary urban ecology, is the theoretical basis to study the implementation of the circular city model with a critical approach.
The recent Covid-19 pandemic has amplified the environmental and economic crises. Urban and socio-economic policies aimed at improving well-being conditions in urban areas are trying to transition towards sustainability models. The European Green Deal (EC, 2019) seems making the economy restart considering the urgent sustainability transition (Loorbach, 2010). The New Green Deal aim at coping with climate change and environmental degradation, ensuring:

- *no net emissions of greenhouse gases by 2050*
- *economic growth decoupled from resource use*
- *no person and no place left behind (EC, 2019).*

The use of renewable resources and the optimization of resource use in the current economic growth dominant model are the main goal of Circular Economy. It defines a different approach to resource management and supply chains to reduce environmental impacts. Circular material resource management reduces both the extractive activities and the production of waste and environmental impacts. This new economic approach can lead to a profound paradigm shift also in the vision of architectural and urban transformations. The social inclusion and democracy of the third point is implemented in the CE perspective by Raworth's Doughnut Economic model (2017) and new Social Circular Economy research .
"No place behind" means to recover and *recycle* wasted places, and *wastescapes*.
The wastescape regeneration research strand stem from the experience the Department of Architecture of Naples started in the h2020 research project *REPAiR - Resource Management in Peri-Urban Areas Going Beyond the Urban Metabolism* (REPAiR, 2018a; REPAiR, 2018b). The Faculty of Architecture of TU Delft and the Department of Architecture of UNINA collaborated as pilot cases in this project, respectively, working on the cities of Amsterdam and Naples. The topics of urban metabolism and the wastescapes were explored in the peri-urban areas of the two cities, developing a collaborative process for the co-creation of circular strategies through a series of Living Labs and workshops. The research topics of the REPAiR project were: (1) the urban metabolism of some materials and waste streams, and (2) the wastescapes, presented and groups of spatial categories classified according to the macro-categories of five drosscapes (Berger, 2006) and operational infrastructures of waste (Brenner, 2014).

The REPAiR methodology intertwined different methods of investigation and analysis of waste metabolism and wastescapes, experimenting with a collaborative approach to the decision-making definition of solutions and management strategies based on the geodesign process (Steinitz, 2012).
Urban design and planning are integrating systemic logic in the development of sustainable strategies. Considering multiple dimensions and different actors involved in policy choices, plans or projects, spatial decision support tools (SDSSs) are essential to make the process fair and transparent (Sugumaran & Degroote, 2010). SDSSs facilitate the whole process in understanding problems, analysing and rationally guiding dialogue. Decision science can handle all sorts of decision-making problems. In the spatial field, decision-making processes concerning architecture, the city and the territory depend on cooperation between many stakeholders and impacts huge groups in society. Actors involved directly and indirectly in plan and project choices must be involved in decision-making processes not only for ethical reasons and because they are the recipients of the project, but because the citizens and stakeholders present in a territory make a project sustainable or not in time.
The Geodesign method is an SDSS. It offers a methodological framework that holds the different phases of planning between multiple actors in a structured way (Steinitz, 2012). Planning and design processes are seldom linear, and in addition to organisation, evaluation and design elaboration, the convergence of interests becomes particularly difficult to manage. Geodesign points out a structured negotiation phase in the last steps of the planning process, which makes the collaboration and cooperation process effective concerning the identification of common goals. They can compromise the goal of most researchers in the different disciplines that have sustainability goals. In synergy with spatial decision-making processes, multi-criteria and multi-group analysis (MCDA and MGA) methods can implement transparency and democratisation of choices in collaborative practices. MCDAs support weak sustainability (Martinez-Alier, Munda & O'Neill, 1998) and keep the structuring of decision trees iterable more times to cope with commonly occurring conflicts between stakeholders in decision-making processes. Indeed, the Geodesign approach, supported by MCDAs, identify a perspective for regenerative changes of wastescapes, where Urban Metabolism and urbanism meet in planning and design challenges for the circular city. The circular city includes resource management and distribution, too, which is also a matter that impacts human rights, like the right to the city, to nature and physical and mental health.

1.2 Problem statement

Starting from the REPAiR research, wastescape are investigated through materials and methods for their regeneration. Because a wastescape is not just a waste land or a waste space, the study's first aim is to explore this new research field further theoretically. Amenta & van Timmeren (2018) define the wastescape as "places such as abandoned territories, underused areas, former and polluted industrial areas, bare lands, and indefinite interstitial spaces, as well as the operational landscape and infrastructure of waste (management)". Thus, the wastescapes is a place where abandonment, degradation or pollution dominate.
In this research, the concept of *waste* leads to a reading of the **wastescape as a cultural landscape**, composed of different physiological and morphological waste systems: social, metabolic and environmental.
Circular economy proposes models to turn waste into resource. Waste is generally identified as material waste, but it is a concept that also manifests in environmental, social, cultural and economic dimensions. Moreover, the circular economy is transferred to the urban contexts with the recent research on *circular city* in many European cities and globally.
The wastescape regeneration goal is set in this background, considering circular economy and circular city models. The problem is systemic: economic process and in urban areas need not only what to cope

with each kind of waste but also how to join the study of different waste systems. In this sense, it is a multidimensional field of research. A systemic approach must be transdisciplinary.
Therefore, urban metabolism, built environment and social dynamics of wastescapes outline some significant systems in the theoretical background and in the case studies.
This research approaches the topic in two different ways:

1. materials-wise: Considering different waste systems, the identification of wastescape components is developed following the Netzstad approach, in physiological and morphological materials of *urbanities* (Oswald & Baccini, 2003);
2. methods-wise: Considering the multi-actor approach in the urban regeneration process at the center of circular city debate. Decision making support systems for multiple stakeholder collaboration are explored through the Geodesign methodology and Multi-Criteria Analysis (MCA).

The materials of the study are urban metabolism of waste, the abandoned and wasted architecture and built environment, and their place communities that live these places. The inclusive and fair approach to urban regeneration in urban planning and design is the challenge: Collaborative practices, co-creation, and co-design processes make local communities active and the urban regeneration processes sustainable over time (Wolfram, 2019; Ferilli, Sacco, & Blessi, 2016; Wang et al., 2014; Zheng, Shen & Wang, 2014). Therefore, material and immaterial values of value-focused thinking (Keeney, 1994) are part of the decision-making processes for wastescape regeneration.
For this reason, both technical and cultural solutions are required to make cities circular: i.e. to improve circular supply chains, recover wasted built environment, and multiple actors and place communities part of the regeneration process. Waste systems and wasted parts of the cities can become the materials to activate circular cities, where collaboration processes also make active communities.
Thus, the materials and methods for wastescape regeneration are multiple (Figure 2).

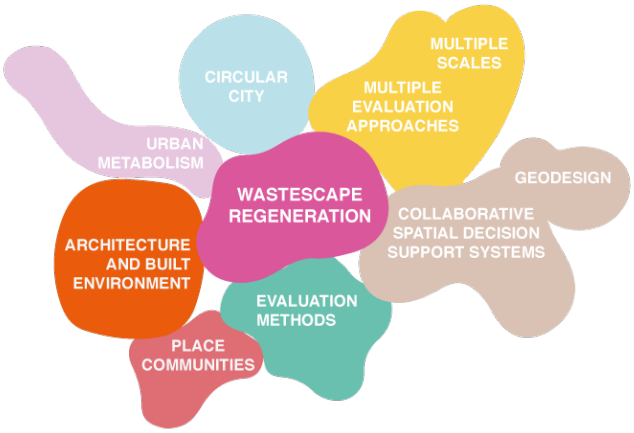

Figure 2. Materials and methods of the study

Therefore, the investigation arises in the research strands of urban metabolism management applied to the spatial context, on the theme of reuse of the wasted built environment and in the involvement of place communities as resources for circular cities. The tools explored for this purpose are the Spatial Decision Support Systems (SDSSs) (Keen & Scott-Morton, 1978; Malczewski, 1997; Keenan, 2003; Figueira, Greco, Ehrgott, 2005; Malczewski, 2006; Boroushaki & Malczewski, 2010; Ferretti, Bottero & Mondini, 2015) that integrate multi-criteria and multi-group analyses in spatial planning to manage different levels of thematic complexity and to guarantee equity and transparency in transformation choices.

1.3 Research objective and questions

As already said, the research aims to investigate the *wastescapes* and their regeneration processes in urban areas in the framework of a circular city. On the one hand, the investigation aims at (1) defining the materials of the wastescapes, on the other hand, (2) outlining methods and tools for evaluations in collaborative decision-making processes.
Wastescape is studied as a cultural landscape, multiple phenomenon in the material, environmental and social perspectives. The different dimensions of waste produce impacts, services, and dysfunctions on the urban environment, both in the environment, economic, and socio-cultural. Indeed, what are the challenges and the opportunities of wastescapes?
Each observation scale implies different questions, and complementary components of the same urban waste phenomenon are revealed at a different grain. Consequently, the research questions arose from general issues on wastescape research started within the REPAiR project. Co-creation is the challenge of carrying out integrated practices for wastescape regeneration by defining the problem and implementing multi-criteria analysis methods to support decision-makers in collaborative processes for the circular city transition.
Consequently, the main research question (RQ) is: **What values, approaches and tools can guide the regeneration of a wastescape to move towars a circular city model?**
Whence, the two sub-questions are:
RQ1. What are the wastescapes? what are the values and criteria for their regeneration? This question needs the definition of the problem.
RQ2. How to evaluate a wastescape regeneration? Furthermore, therefore, which approaches can support circular city-oriented regeneration processes? Which methods and tools can support those? This question needs the identification of an evaluation framework.
In order to answer these questions, in the theoretical part the literature on the crucial issues is explored, in the case studies the collected data and field observations help to verify or disprove the basic hypotheses and to understand some specific phenomena and issues on the topic.

1.4 Research design and methodology

The research approach and the methodology started from a central hypothesis: Wastescapes are potential resources for the circular economy in urban contexts and, then, for the circular city transition.
The aim of wastescape regeneration needs to detect materials and methods for an evaluation framework able to support inclusive and interactive decision-making for the implementation of circular economy models. Because the wastescape investigation emerged from the REPAiR project, the study materials have been partly given in the definition of the problem and, then, advanced in the research. The adopted approach, in this way, integrates both the inductive and the deductive method (Fig. 3). The theoretical framework has been developed with the case studies research, testing and learning from the different selected examples.

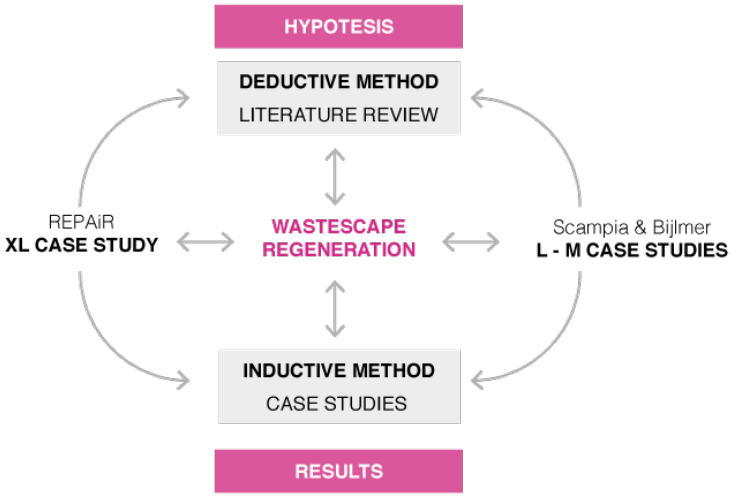

Figure 3. Research approach.

The deductive method and the inductive method integrate the theoretical concepts with the experience gained through the case studies in an incremental process of continuous learning referrals, integrations, and feedback.

The theoretical background is built on the issues about circular economy and circular city (OECD, 2020; CIRCULAR CITIES Declaration, 2020; Petit-Boix & Leipold, 2018), which supported the exploration of the problem. In this framework, the urban metabolism of waste (Sanches & Broto, 2020) and environmental justice (Schismenos et al., 2019; Schlosberg, 2009; Wenz, 1988) embrace issues from a large-scale impact very local urban areas.

For this reason, the wastescapes understanding requires an approach that consider different dimensions of urban environment. The selection of case studies at different scales allows to deepen come specificities of urban metabolism and wasted architecture, from territorial to urban, interpreting the wastescape regeneration prosess different from waste flows to the built environment, with a social inclusive approach.

According to the above perspective, the strategy of adaptive reuse (Davis, 2019; Wong, 2016) of the wasted built environment and the urban services are significant in wastescape regeneration at a local scale.

For the definition of wastescape evaluation frameworks, materials and values emerged from field works. The problem definition has been analysed in different dimensions and at different scales.

In particular, the urban waste issue understanding has been carried out at two different main scales (Tab.1) that correspond with the two different categories of case studies:

1. **From Regional to District scale**: The management of waste metabolic resources is relevant for circular economy strategy implementation.
2. **From Neighbourhood to the Lot scale**: The urban regeneration of wasted architecture and city ghettos make the city circular.

These categories make it possible to identify the different significant scales against which the case studies have been selected and explored:

1. XXL Regional;
2. XL Municipal and District
3. L Neighbourhood
4. M Lot
5. S Building.

The different scales characterising the case studies are analysed by identifying some dimensions considered relevant:

6. Metabolic dimension;
7. Architecture dimension;
8. Social dimension.

Each dimension makes it possible to clarify the characterising components and the types of processes that can activate the regeneration of the various waste landscapes. The Social Dimension can be considered transversal to the different scales, including evaluating the social impact of the choices, a crucial point of wastescape regeneration according to a multi-actor perspective. The different dimensions considered in the two scales of case studies aim to understand the critical elements in regeneration strategies toward circular cities.

Table 1. Scales and dimensions of the research.

SCALE	METABOLIC DIMENSION	URBAN DIMENSION	SOCIAL DIMENSION
XXL / Regional	Urban Metabolism of waste, circular resource flows and stock management		Involvement in collaborative decision-making processes; Place-based community resources.
XL / Municipal / District			
L / Neighbourhood		Wasted built environment and adaptive reuse	
M / Lot			
S / Building			

At an inter-municipal scale, the waste metabolism and the SDSS developed in the REPAiR has been investigated.

At the local scale, the two case studies identified allow us to analyse the factors that have determined the condition of the wastescape. The waste areas of the modern suburbs of the large European cities constitute significant spatial areas of investigation on this theme. In these places, the morphological processes determined by a specific top-down 20th-century modern planning have clashed with unforeseen physiological processes of the places' lives. The rejection process of these large residential complexes had enormous costs and impacts, both in economic and environmental and above all social terms. They also tell the story of the failure of top-down planning approaches. Solutions have been implemented so far for their regeneration teaches what to do or not in the contemporary perspective of transition towards circular cities.

Meaningful criteria and evaluation methods to support circular strategies depends on the system considered and the reference scale and applies on a case-by-case basis.

Through this dynamic lens, the study of waste metabolism and wastescapes has been developed iteratively to define a wastescape evaluation framework (Figure 4)

The methodological approach is therefore divided into three main phases:

I. The first relates to the construction of the theoretical background, in which the relevant themes characterising the main issues addressed were investigated: the circular economy and the circular city, with particular attention to the interactions between the economic, social, urban and territorial components in which circular processes assume a crucial role; environmental justice, which allows to integrate the themes of equity and ecology, investigating the relevant components that should be the prerequisites of a regeneration process of waste landscapes; the urban metabolism, which integrates the ecological issues and allows to reinterpret the transformation processes considering the city as a living ecosystem; the adaptive reuse considered as a possible intervention strategy that allows to activate the regeneration of wastescapes starting from the building scale and the urban scale, with attention to the impacts that can be determined at different scales; the ecosystem services that represent the interpretative key to analyse the metabolic processes and the impacts of transformations; the Geodesign approach as methodological framework of a decision-making process in which planning dialogues and interacts with the construction of knowledge and choices; the Social Multi-Criteria

Evaluation (SMCE) as context in which to structure the evaluation, intended as an approach to manage complexity and, at the same time, to integrate knowledge and skills to reduce conflicts and support the elaboration of inclusive choices of wastescape regeneration.
II. The second is aimed at developing the "theory" section, in which to outline the wastescape evaluation framework. The first two parts correspond to the “problem definition" and "problem evaluation” of wastescape components. Since waste systems define both the constituted space and metabolic systems, the structure of the Netzstadt approach was applied to this study, distinguishing physiological and morphological components. These two macro-groups of waste systems are the subject of the evaluation problem and guide decision-making processes for their regeneration in urban settings. For this purpose, the definition of objectives is defined from the theoretical background of the first phase. Methods are explored according to the reference system. Methods and tools are identified according to the objectives of evaluating the multiple dimensions of circular and collaborative regeneration, thus multi-scalar, multi-dimensional and multi-group.
III. The third phase focuses on case studies, identified taking into account the possibility to explore the concept of wastescape at different scales. In the REPAiR project, urban waste metabolism is investigated as a waste system at the XL scale. The main obstacles hindering the implementation of circular economy strategies in Campania are investigated concerning two main waste fractions: organic waste and construction and demolition waste. The spatial decision support tool developed within the project, the Geodesign Decision Support Environment, was tested to apply a multi-group regeneration process by developing circular economy strategies. Restricting the observation to a more local scale, case studies on two neighbourhoods in Naples and Amsterdam allowed exploring social and architectural issues in wastescape scenarios.

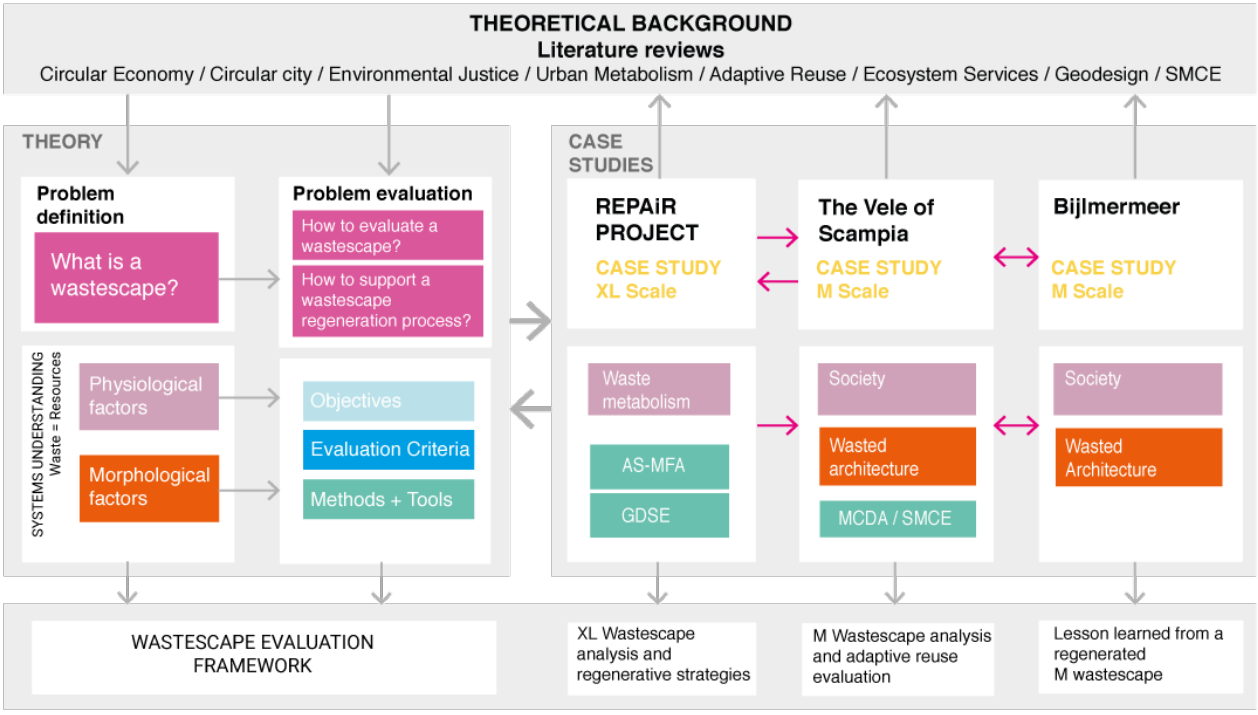

Figure 4. Methodology of the research.

Following the main steps, the study has been more oriented to a theoretical or an empirical approach according to the materials and methods explored (Fig.5).

Figure 5. Research flow between theoretical and empirical research.

The methods adopted are in part those of the large scale case study of the REPAiR project to study the urban metabolism (MFA) and to carry out the collaborative spatial decision-making process (GDSE), and integrated with some multiple criteria decision methods (MCDMs) to cope with multi-dimensional evaluations at a smaller scale. Multi actor approaches with the Multiple Criteria Evaluations (MCE). In the framework of the co-creation approach of the REPAiR project, looping action for UM were directly experimented in implementing and testing the new tool: Geodesign Decision Support Environment (GDSE), applied to the REPAiR case study of the Naples focus area.
The multidimensional and multiscale approach to the research is, then, oriented to explore the hypothesis of wastescapes as potential resources for the circular city transition.
In summary, wastescape as a complex problem was broken down into specific themes according to the two main significant scales mentioned for each waste system and analysed using cross-sectional methods.

1.5 Relevance

Wastescape regeneration is significant in the transition to circular cities and the context of recent European politics. Circular Economy is considered an effective tool for reducing the environmental impacts of the current economic system, but globally it is still poorly implemented. The circular economy strategies that also consider urban ecology principles of equity and environmental justice drive enormous social benefits at regional and local urban scales. Since urban phenomena depend on the human activities of the territories, the circular economy can affect the metabolism of cities. The non-hazardous urban waste can be a significant resource in the circular economy, that is at the heart of the Green Deal and the European Agenda
In the path of circular economy, circular cities (Williams, 2019) and doughnut city models (Raworth, 2017) constitute a mine of opportunities for the sustainability transition agenda (Köhler et al., 2019) and to create new jobs. Working with waste is like starting from the end of the pipe of the linear economic processes. However, circular activities reduce the weight of incoming metabolic flows (raw material extraction), reuse the built environment, and reduce the outgoing waste flows. In this circular processes, and even more in the doughnut economy model, the role of people and local communities is relevant. Culture and creativity produce new values, monetary and non-monetary, in the urban environments.
Thus, circular cities concept seems to match with the New European Bauhaus paradigm.
The new European Bauhaus (NEB) movement (European Commission, 2021) is a creative and interdisciplinary initiative where art, culture, social inclusion, science, and technology meet to create a *beautiful* Green Deal by making it a cultural human-centred and positive, tangible experience. NEB is a movement and a network of laboratories (Fig.6).
The necessity of beauty is claimed for:
- **inclusivity**, by creating accessible spaces as places of dialogue between diverse cultures, disciplines, genders and ages;
- **sustainability**, by implementing solutions that generate a nexus between the built environment and the natural ecosystem through a regenerative approach;

- **spirituality** by going beyond the pure eco-efficiency of the material dimension and getting inspired by creativity, art and culture.

Figure 6. The New European Bauhaus principles.

The NEB Conference (April 22-23, 2021) explored different perspectives on the movement's evolution with various panel discussions. It emerged that the NEB aims to become a bridge between art and technology in a global world to arrive at the people's real life. A conversation with Ingels highlighted that culture attracts more investments than how investments attract culture. The value of culture is a core in economic growth and (we can add) in the circular economy transition.
The current situation showed how real life is so unpredictable that scientific methodology needs this multidisciplinary and multiple perspectives to cope.
NEB is not only about buildings but also about the design role in making initiatives. Co-design the future is the future, but already the present in several urban projects. It seems NEB aim at institutionalizing the co-design of NEB solutions for the Green Deal. Many different disciplines are crucial to be integrated into the design process. They also need prototyping solutions on the ground, new human abilities, accessibility that can flip our idea to who can afford something: Education; Hybrid occupations in this new system; Integration of technology in real life not to make people subject to analysis, but driving things; Everyone can take part.
The New European Bauhaus is not only about buildings. A new perspective to requalify public space and all the scales of the human environment. The New Bauhaus is about education and collaboration, temporary and permanent.
A vision of a sustainable and inclusive future, which is beautiful for our eyes, minds, and souls, goes beyond technicalities and aesthetics as a visual phenomenon and aims to reconnect all categories of human well-being to its surroundings. It is vital for a new economic model that aims at starting from waste. A circular economy needs to subvert the perception of what we waste, and to go in this direction, design and collaboration are fundamentals.
The approach to urban regeneration starting from wastescape is, thus, an opportunity in this transition. No formulas can be replicated everywhere, but approaches and visions do. This study is connected in multiple values, approaches and tools in the objective of the urban wastescape regeneration with the NEB vision.

1.6 Organisation of the book

The division of the book is into five Parts, each one hierarchically subdivided in Sections, Chapters and Paragraphs. Part I presents the introduction to the theoretical context. Through an introduction to the

academic context in which the research stands, the first part aims at offering a systemic approach to wastescape study. The research methodology has a multidisciplinary and multiscale approach, integrating different wastescape materials and methods. The relevance of the research is highlighted in contemporary open waste management issues, that can continue to be deepened and developed. The Part II define and break down the concept of wastescape. In Section 2, the definition of wastescape is analysed starting from the existing literature. A reading of the wastescape concept as a cultural landscape broadens the starting point of this research in the context of circularity. The materials analysed in this study are limited to some significant categories of waste: material waste and wasted architecture. The last chapter of the second section raises whether a wastescape is a hyperobject.

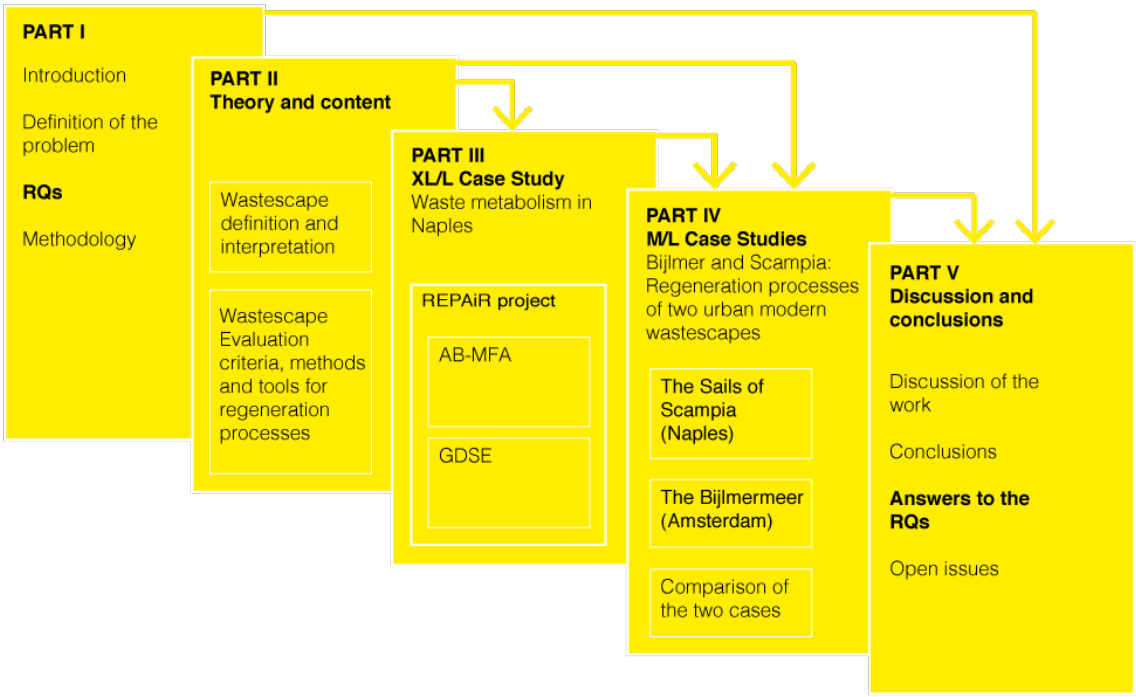

Figure 7. Organization of the book.

Section 3 of Part II is about how to structure a wastescape evaluation. For this purpose, criteria and significant Services and Urban Metabolism indicators become the parameters. The goal of social inclusion and environmental justice requires that the assessment and transformation process be collaborative, using decision support tools based on multi-criteria and multi-actor analysis.
The Part III of the book is an inter-municipal scale analysis of the work done within the REPAiR research in the case study of Naples. Section 4 present materials and toold for waste metabolism management tested in the Naples case, highlighting both contributions and limitations of the work carried out and further opportunities for future developments of the tools for waste management in Campania Region.
The Part IV of the book presents two case studies on a neighbourhood scale: The Vele of Scampia (Naples) and the K-buurt of the Bijlmermeer (Amsterdam). These cases allow us to enter into the merits of specific social and spatial issues of the generation of the phenomenon of wasted architecture and social exclusion. The two modernist suburbs demonstrate that the relationships between morphology and urban physiology, i.e. between architecture, built environment and social dynamics, can strongly interplay in the generation of wastescape condition. The comparison shows that the sustainable regeneration processes of two modern neighbourhoods in contemporary cities can derive enormous benefits from what now is considered a problem.
In the Part V, the general discussions and conclusions highlight the main steps, results and lessons learned from the research and main directions for the future development of the issues addressed.

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PART II
Theory and content

Introduction

Part II explores the theories and contents related to the research materials and methods: What is a wastescape, what defines it, and what kind of methods and tools can support wastescape regeneration. In Section 2, the wastescapes study is analysed starting from literature, and, eventually, it is further investigated. They are landscape of abandonment and rejection, that involve multiple dimensions and are subject to local culture and subjective perceptions. Waste and wasteland are products of current linear growth economic model. Waste display in urban and peri-urban contexts at a different scales. Rejection, abandonment and segregation are features of any waste phenomenon. Therefore, *waste-scape* is analysed and presented as a negative and multidimensional cultural landscape. As material waste is a refusal of a production process, a wasted land is the negative side of the production of space (Neumann, 1992), analogously, the outcasts of modern society are *wasted lives* (Bauman, 2004).
The Netzstad method (Oswad & Baccini, 2003) is proposed to support wastescape analysis with physiological and morphological urban systems. Since the wastescape is understood as a cultural landscape made of different waste systems, not merely a part of the territory, the section concludes by posing the question, "is the wastescape a hyperobject?", that can open the field to future research.
After defining wastescapes, i.e. the research materials, Section 3 deal with wastescape regeneration process, coping with the objectives, criteria and decision-making process. This research starts from the Circular Economy postulate that states waste is a resource able to generate new values. Circular Economy (CE) and Circular City (CC) models are gaining momentum in urban ecology and policies oriented to the sustainability transition (Köhler et al. ,2019). To overcome the take-make-dispose current linear economic model, CC are developing approaches and strategies to implement urban the Sustainable Development Goals (SDGs) in the frame of new European policies. Nevertheless, the CE paradigm embrace needs to be further clarified and integrated with other thought schools that consider social matters, for more fair, sustainable and regenerative cities. As resources for CC, wastescapes need an evaluation framework to be regenerated. Because in this dissertation wastescape is considered as a cultural landscape, the perspective for their evaluation is anthropocentric, but in a deep ecology perspective. Thus, Fundamental Human Needs (Max-Neef, 1991) and the Urban Landscape Services can be benchmarks in multi-criteria evaluation processes. In this research, Urban Metabolism, Built Environment and society are the three wastescape systems identified. Consequently, the methods for their assessment are: the material flow analysis and the Multiple Criteria Decision Methods. They make evaluate transformation alternatives of the BE and the collaborative multi-actor approach to decision-making processes. Each one works as a decision support tool, but they can also be integrated in a workflow like the collaborative decision-making process of the Geodesign method.

2 WASTESCAPE DEFINITION

Photo 2. Honey, would you take a picture of me with the decay? Tourists in Naples immortalise themselves in a wastescape ten years after the waste emergency. Author: Giulia Follo, Quartiere Maddalena, Napoli. 2018.

Relationship of waste and space are an issue and a cultural matter, that we can find in metaphors like waste place (Lynch, 1990) or Junkspace (Koolhaas, 2006).
In human history, urban settlements arose where geographical conditions or available resources favoured life-sustaining production processes. Today, technology has enabled cities to be fed by material and immaterial resources, from any geographical origin, pushed by the global markets. Thus, as the network of logistic has become more dense and extensive, cities are using faraway places to dispose of their waste. At the same time waste lands are widespread in urban and peri-urban areas.
The research on wastescape place in the path of that on wastelands and waste management in urban areas. The objective is to regenerate wastescapes in the circular city transition. The challenge is to integrate the spatial dimension of waste with the urban metabolism studies. In recent decades by current linear economic model, that generate mountains of waste and pollution, that has repercussions on human health, exposure to environmental risk factors, and severe damage to the whole ecosystem. Environment, economy, society constitute a single system, which takes different forms according to local culture and at different geographical scales. Human impacts on the ecosystem affect all phases of human processes and all scales of production chains: the extraction of raw materials, the provision of ecosystem services, the quality of resource distribution and use processes and the sum of the outputs of all urban metabolic processes. In these processes, every productive human activity produces waste. But while in natural ecosystems the waste of one organism is food for another, man has generated production processes whose waste cannot always be absorbed by nature, producing substantial negative impacts, such as environmental pollution (air, soil, water, etc.), damage to other living beings and solid social inequities.
The wastescape is decomposed in some *pieces*, that will be joined eventually.
The systemic thinking let think about the idea of waste as a resource at any dimension, connecting urbanism, (circular) economy, human activities with natural processes.
In Chapter 2.1, the concept of wastescape is deepened. Wastescapes stem from h2020 REPAiR project in the path of literature on drosscapes. Starting from the etymology of the term, contextualizing it with other *-scapes*, the wastescape is defined as a cultural landscape, made of waste systems, that are regarded in a specific cultural perspective, therefore as a cultural landscape. All types of waste and their impacts constitute subsystems of a *wastescape*, which therefore has morphological and physiological characteristics. From this interpretation, finally, we ask if the wastescape can be also hyperobject.
Based on the characteristics identified, the Chapter 2.2 presents the Netzstadt method, that is suitable for the wastescape study. In fact, it links morphological and physiological systems to the study of *urbanity*, and provides a theoretical and practical framework for evaluating the waste systems that make up wastescapes.

2.1 Wastelands, Drosscapes and Wastescapes

A search of papers containing the keyword "wasteland" in Scopus "wasteland", excluding the medical research categories, gives a n. 2012 of papers published between 2002 and 2021. A visual analysis in VOSviewer (Van Eck & Waltman, 2013) shows some significant keywords: Soil, city, life.

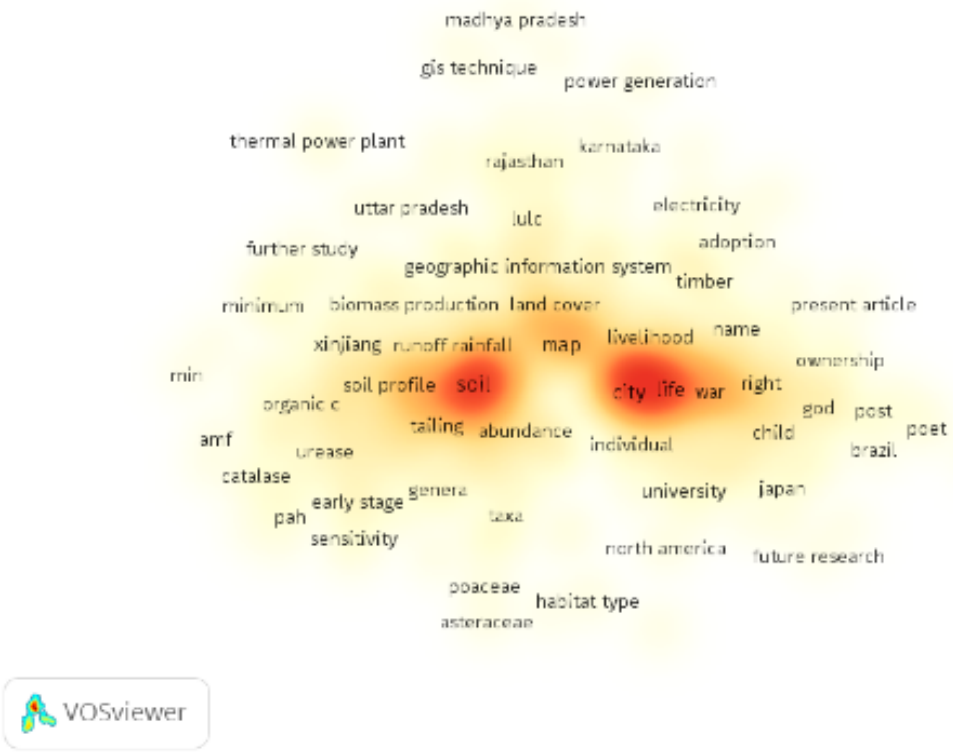


Figure 8.. Wasteland literature landscape (2020). Elaboration in VOSviewer.

Soil is a finite resource, and as cities continue to consume it a large amount of wastelands are formed. Hall (2013) define "*the concept of wasteland is one that resonates strongly in contemporary urban studies. Wasteland has been seen as an example of Foucault's (1998) notion of heterotopia, a range of "different spaces" and "other spaces" that somehow challenge or contest the space we live in (see Johnson, 2006; Dehaene and De Cauter, 2008). Terms that surround the concept of wasteland include "dead zones" (Doron 2000, 2008), "free space" (Boffet and Rocca Serra, 2001), "nameless space" (Boeri, 1993; Eshel, 2003), "blank space" (Jackson, 1997), "brown fields" (Bowman and Pagano, 2000; Haase, 2008), "liminal space" (Endsjø, 2000), "no man's land" (Woods, 2000), "derelict land" (Oxenham, 1966), "urban void" (Cheung, 2000; Clapp, 2005), "terrain vague" (de Sola-Morales, 1995), "untended landscapes" (Lynch, 1990a), "blight" (Greenberg and Schneider, 1996), "industrial ruins" (Edensor, 2005), "urban desert" (Guttenberg, 1978), "backsides" (Lynch, 1990a, 1990b), "brownscape" (Berger, 2008; Grimm and Dosch, 2010), "gapscape" (Hormigo and Morita, 2004), "drosscape" (Berger, 2006) and "edgeland" (Farley and Roberts, 2011). As Doron (2008: 203) points out, 'The multiplicity of names and some of their meanings, show the difficulty in defining those spaces'".*

Despite the growing interest on the topic, a detailed classification wastelands is still missing in the European landscape (Talento, Amado, & Kullberg, 2019).

The American planner Alan Berger was the first to classify the different places of waste in the America, defining them as "***drosscapes***" (Berger, 2006):

9. Waste Landscapes of Dwelling (LODs): designed voids with amenities that serve nearby residents of housing developments, like trail networks and private golf courses, either open to

the public or private facilities. Landscape vegetation areas which serve as reserves or transitions between the infrastructure are also included in this category.

10. Waste Landscapes of Transition (LOTs): spaces that are victims of real-estate speculation, intentionally designed as transitional land uses, such as staging areas, storage yards, parking surfaces, transfer stations.
11. Waste Landscapes of Infrastructure (LINs): the landscape surfaces connected to the infrastructure, including easements, setbacks, and rights-of-way associated with transportation (such as highway corridors and interchanges), electric transmission, oil and gas pipelines, waterways, and railways.
12. Waste Landscapes of Obsolescence (LOOs): Places of waste stock or treatment, like landfills, salvage yards, wastewater treatment facilities and reclamation plants.
13. Waste Landscapes of Exchange (LEXs): This category encloses semi-active or non-active urban developments such as decaying and vacant malls.
14. Wasted Landscapes of Contamination (LOCOs): all those abandoned facilities that are polluted.

These categories are the references of wastescapes classification in the REPAiR project.

2.1.1 *Wastescape* definition from literature

The concept of wastescape arose in the REPAiR research project including the spatial dimension of waste in the study of resource management.

Wastescape are places that lost their environmental, technological and social values (Amenta & van Timmeren, 2018). They are landscapes of waste, where dysfunctional urban metabolism processes produce various phenomena of abandonment and degradation. For example, the decay of productive activities due to macroeconomic factors, social or political events causing migration, various licit or illicit human activities can cause the degradation of land, an urban area or an entire neighbourhood or city. Compared to wastelands, the pure condition of abandonment does not define a wastescape. Here, factors such as pollution, inconvenience and services are the main indicators: we are therefore dealing with areas of environmental, economic or social degradation.

The agents of degradation are identified in metabolic processes dysfunctions. The relationship between cities and urban metabolism through the economic activities is the core of sustainability and the health of the ecosystem. The economic processes shape the urban environment and the space.

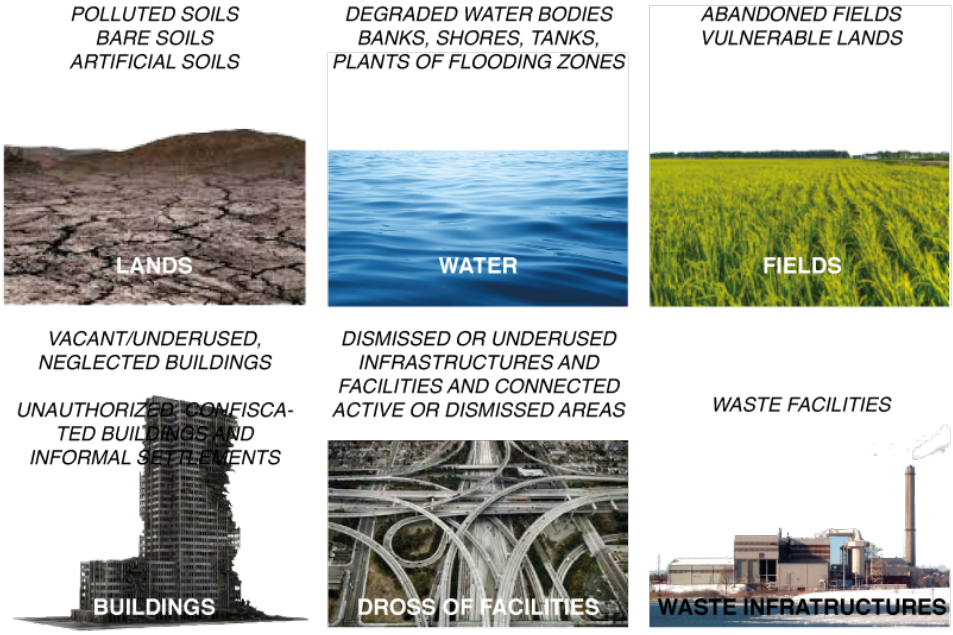
The first definition of wastescape appear in the Spatial Analysis Glossary of the PULLS Handbook Deliverable 5.1, (Russo et al. 2017) "*patches of landscape related to waste-cycle both by functional relations and also because they are "wasted-lands", areas not included in the periurban development scenarios, becoming neglected spaces. Therefore, with the term waste-scapes we refer to peri-urban elements of urban regions known both as DROSSCAPES and OPERATIONAL INFRASTRUCTURE OF WASTE*". Thus, in the REPAiR research, wastescapes were classified according to categories of drosscape (Berger, 2006) and operational infrastructure of waste (Brenner, 2014) (D.3.3, REPAiR, 2018).

The categories of wastescape classified in the REPAiR project are:

Degraded Lands: Lands that have lost some degree of their natural productivity due to human-caused processes, this category includes: polluted (W1.1), bare (W1.2) and artificial soils (W1.3).

Degraded water and connected areas: Degraded water bodies; elements functionally related to them; and territories in crisis for hydraulic reasons. The following subcategories are distinguished: W2.1: water bodies, degraded for quantitative or qualitative reasons (i.e.: polluted, draining up, overflowing, etc.): rivers, canals, basins, streams, ditches, water pipes, culverts, wells, etc. W2.2: banks, shores, tanks, plants, and other elements linked to W2.1 W2.3: flooding zones.

Declining Fields: Vacant/under-used fields, vacant parcels, and vulnerable soils. The subcategories are: Abandoned fields and parcels (W3.1), and Vulnerable lands (W3.2).
Settlements and buildings in crisis: Vacant/underused, neglected or obsolescent buildings and settlements (W4.1), and Unauthorized, confiscated, buildings and informal settlements (W4.2).
"Dross" of facilities and infrastructure: This category includes: dismissed or underused Infrastructures (W5.1) and Facilities (W5.2) as well as - both active and dismissed - areas connected to them (W5.3).
Operational Infrastructure of waste: Operational infrastructures of waste are the facilities dedicated to the waste storage and management.



REPAiR Wastescapes classification (D.3.3, REPAiR, 2018)

Starting from the REPAiR research (Geldermans et al., 2018), Amenta et van Timmeren (2018) has defined the wastescapes as "Wastescapes are defined as parts of landscapes going through a linear transition from valuable, accessible, public and natural landscapes, towards a variety of impacted areas involving wastefulness, inaccessibility, social/environmental degradation, and decreasing natural value". It has its foundation in the Lynch analysis of waste (Lynch, 1990) where waste has been defined as the "dark side of change" and the natural outcome of growth.
The approach to Wastescape study in the D 3.1 REPAiR WP3 (Geldermans et al., 2017) developed territorial metabolism models with: Spatial Analysis, Material Flow Analysis and Social Analysis. A methodological framework set a comprehensive wastescapes characterisation focused on the material and immaterial relations that expresses *hybrid* types of spaces. The methodological process is articulated considering three main steps:

1. The identification of knowledge base distinguishing among: a General Geography (GG), that identifies the repartition of physical environment, the Physical Geography (PG), that expresses the features of the physical environment, the Human Geography (HG), that describes the spatial organization of human activity and human interaction with the physical environment;
2. The implementation of a checklist analysis, able to identify real features (objective, hard data, as erosion, pollution, deforestation, underuse, dereliction, overharvesting, etc.) and perceived

features (subjective, soft data, as dirtiness, smell, noise, useless, inaccessibility, risky, etc.) that characterise each Wastescape, expressed by the geography composite indicators;

3. The elaboration of Wastescapes categories, considers a cluster including a hybrid combination of both natural and anthropic ecosystems Each category of Wastescape can be identified on a map, resulting from an aggregation of composite indicators (Geldermans et al., 2017).

REPAiR, wastescape classification provides spatial categories where phenomena connected to abandonment and the urban metabolism of waste make the area compromised and dysfunctional. Nevertheless, metabolic indicators have not been considered in the wastescape maps of the Naples case study of REPAiR project and the spatial analysis has not been fully integrated with the material flow analysis. This point will be discussed in Section 4. It is important to consider that waste management dysfunctions that produces wastescapes, impact with disvalues and disamenities on territory (Taelman, Tonini, Wandl, & Dewulf, 2018). Wastescape are therefore closely linked to metabolic processes related to the production of waste, in the different meanings of the term. Wastescape has been explored in the Naples case study of the REPAiR project in a multi-methodological approach (Cerreta et al., 2019). Thus, according to the current definitions of the topic, wasted landscapes are *parts of the territory that suffer from abandonment, degradation and exclusion* from urban and peri-urban areas.

2.1.2 Wastescape: a contemporary *cultural* landscape

In a comment on Berger's research, Shannon (2006) states that drosscapes are the *dark side of man cultural landscapes* and they have the potential to become *new (cultural) landscapes for tomorrow*. New landscape creation corresponds to other landscape destroy. As result of urban growth, 21st century human agency and post-industrial dynamics created spatial leftovers present vast scarred, ugly, abandoned and industrially polluted territories. As the abovementioned classification, Berger has defined three types of waste landscapes:

1. actual waste, or metabolic waste as solid waste and sewage,
2. wasted places, i.e. abandoned or contaminated sites, and
3. wasteful places, such as vast parking lots and malls.

Drosscapes are not identified with a positive or negative connotation. They are simply the result of the growing (social) metabolism of human activities and their organization in space. Wastelands are products of neglect and absence, but spontaneous vegetation can also be a reserve of Ecosystem Services (Robinson & Lundholm, 2012). Even the brownfields may contain more biodiversity than other urban areas (Mathey, Rößler, Banse, Lehmann & Bräuer, 2015). Urban development and the environment relations are regulated by social metabolism and the access and provisioning of resources (Schott, 2014). Historically, the disciplines related to the study of metabolism are those of the social sciences, the natural sciences and more recently industrial ecology.

The physical spaces of living are predominantly the domain of the technical and constructional disciplines of architecture, city architecture and urban planning in the last century.

Wastescape are defined in relation with urban metabolism phenomena and with a positive meaning, as potential places to activate circular urban regeneration processes (Amenta & van Timmeren, 2018).

Starting from the etymology of the term, it seems possible to identify different dimensions of waste, that are components excluded from a system, produced by different conditions of abandonment and exclusion without the possibility of restoring an interaction.

If we consider:

15. The waste of consumer goods: i.e. Trash, garbage, rubbish.
16. The waste of built environment: abandoned buildings, polluted areas, unused infrastructures, etc.
17. The waste of social systems: ghettos, marginalised groups, discarded lives (Bauman, 2004).

Thus, considering only the environmental performance of an area does not allow the evaluation of a wastescape, because they do not consider the social and cultural values produced by a landscape.
The wastescape systems are results of interplay between metabolic flows, the built environment and people, through economic activities within the urban ecosystem. People build and dwell the built environment and manage the resource management according to their needs and possibility. Urban metabolism provides goods and resource for people well-being, but also its waste impacts on the environment. The built environment modifies the urban metabolism, both because of its construction or demolition, and because of people activities that take place. Economic activities are the core of all the urban processes (Figure 9).

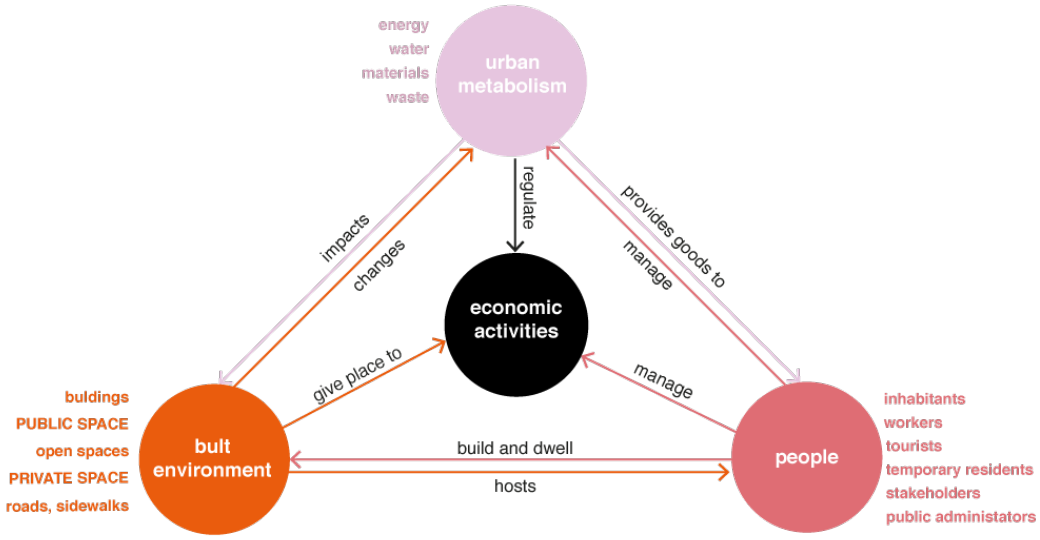


Figure 9. UM, built environment and people relations through economic activities.

In this perspective, Circular Economy (like any other form of economics) is the key of the *production of spaces* for urban life and the core of any strategy of urban regeneration.
Each one of these components has a waste *side* that produce negative impact on the urban and natural ecosystems. Ecosystems Services and benefits can be integrated in landscape planning, management and decision making (de Groot et al., 2010) to improve sustainability. As well as landscape produce functions, services and benefits, wastescapes produce *disfunctions, disservices and disadvantages*. Clear classification of wastescape based on disservices indicators, and decision making tools for their regeneration processes are a challenge. This point will be the object of the Chapter 3.2.
In this perspective the wastescape classification can be reformulated starting from the methodology outlined in the REPAiR Deliverable 3.1. The condition of wastescape is given by the disfunctions of Human and Physical Geography that produce disservices and affect human needs. From this viewpoint, informal living should not be considered a wastescape, like in the category W4.2. Occupation per se cannot be a category of wastescape, the quality of the settlement makes a building a wastescape or not. For example, the informal settlement of the David Tower in Caracas won the Golden Lion the 2012 Venice Architecture Biennale *Common Ground*, being the world's largest squatted skyscraper, as an example of social self-organisation (Gomez, 2014).
In literature, wastescape are often mentioned as *landscapes of waste*.
In the definition of *landscape* given by the Council of Europe in the European Landscape Convention (Art.1, ELC, 2000), "*'Landscape' means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors".*
The definitions of landscape in the Garzanti Italian Dictionary define landscape as "a portion of territory as it appears to be embraced by the gaze of a subject". Additionally, according to the Cambridge Dictionary, *landscape* is "a large area of countryside, especially concerning its appearance".

Thus, a landscape is the image of a land, an area, where the cultural component is manifest both in the modification of that area, and in the point of view of those who recognize cultural values in it.
According to the European Commission, *'waste'* means any substance or object which the holder discards or intends or is required to discard" (Art. 3, Directive 2008/98/EC).
It is related to the discard action and to the simple intention of discarding too. Wasting is related to the action and the intention.
The suffix "-scape" gives a topic a cultural and subjective dimension. Salazar (2013) defines *Scapes* like topological metaphors in the anthropology of globalisation.
Arjun Appadurai points out the 5 *scapes* of the new global cultural economic flows. The new global cultural economy is seen as a complex, overlapping, disjunctive order, that can't be understood in terms of center-periphery. Global cultural flow, a theory coined by Arjun Appadurai, demonstrated the definition and effects of cultural flows in five distinct **scapes**: (a) ethnoscapes, the migration flows, (b) technoscapes, (c) financescapes, (d) mediascapes and (f) ideoscapes. They are global cultural flows that are results of the process of globalization**.** Thus, the suffix -scape indicates fluidity and irregularity, because it is a matter of fact that those flows are all in constant change. It also explain that flows have not an objectively given relation. (Appadurai, 1990; Rantanen, 2006)**.** As people move, ethnoscapes change; as technology is moved around and invented, technoscapes change; as capital moves around the world as part of the global economy, financescapes change. (Powell & Steel, 2011)
In this path, a **wastescape** is a *-scape* on the huge global flows of waste. Also, due to the subjective condition that make something a waste, that is a cultural choice, it not only refers to rubbish, but to any wasted thing. Consequently, whereas the etymology of the terms defining it, a *wastescape* can be seen as a cultural scape on *any substance or object which the holder discards or intends or is required to discard.*
Thus, in this interpretation, the urban metabolism of waste flows is a wastescape, such as the wasted built environment or the marginal communities of an urban areas. In this perspective a wastescape is not a place, but a perception of a place. In this interpretation, wastescape take place at different scales and through different dimensions, always as a product of human agency.
The agency of consumerism, linear metabolic processes and urban exclusion dynamics produce different phenomena of waste in the context of urbanization (Figure 10).

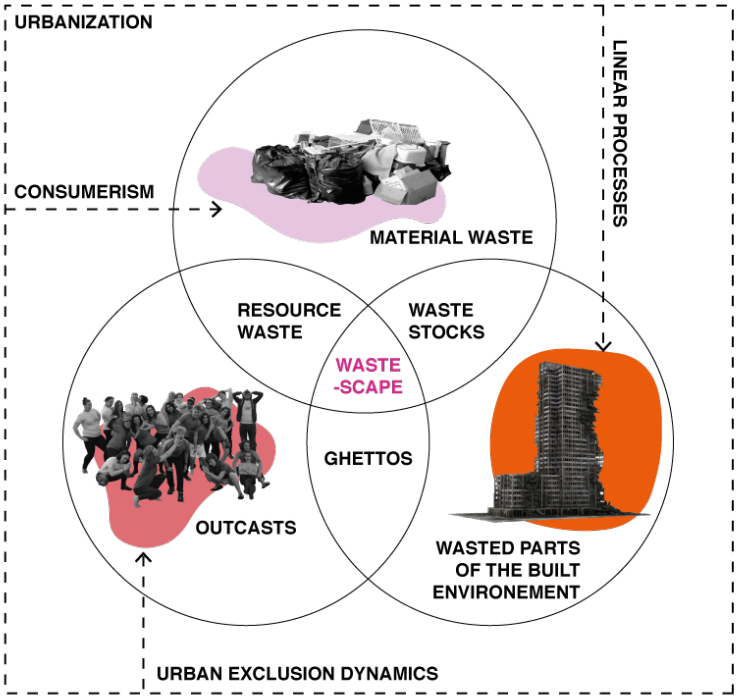


Figure 10. Drivers and dimensions of an urban wastescape.

Some waste dimensions are:

1. material waste: produced by the non-recognition of the value (resource flows and stocks);
2. spatial waste: abandonment or rejection of parts of the built environment (resource stock)
3. outcasts, ghettos: individuals and groups not integrated into the organisation of the social system, often poor, and therefore excluded from collective urban life activities.

In this study on wastescapes, the material and spatial waste are considered together with social issues, without deepening the dynamics of city outcasts. Social issues are coped through the approach to collaboration processes as enabling factors for regenerative urban dynamics.

The relations between the different categories of waste identified say a lot of urban metabolism dysfunctions. Material waste, or commonly known as garbage, are produced at any stage of economic and daily consumption activities. This will be the subject of Paragraph 2.2.1. Poor people, like roma, live working in recovering waste from (formal and informal) dumps, or in illicit waste management.

Consequently, wastescape can be understood as **cultural landscapes of waste** where multiple material and immaterial dimensions that generate multidimensional degradation phenomena (Table 2):

18. Aesthetic degradation due to abandonment and decadence,
19. Environmental degradation due to pollution,
20. Exclusion from the rest of the territory due to social rejection or physical closure from the context,
21. Social degradation due to the condition of people living in ghettos excluded from the rest of society.

As stated in the premise and previous paragraphs, the urban contexts are the privileged areas of waste production and the place to trigger virtuous processes of circular economy for the transition to sustainable and circular cities.

Table 2. Wastescape criteria per dimension.

Dimension / Driver	Socio-cultural	Environmental	Economic
Abandonment	Marginalisation, low cultural level	Absence of care	No economic value of the place
Degradation	Poor housing condition	Presence of pollution, decadence	Negative economic impacts on the surrounding areas
Exclusion	Ghetto, social segregation	Non accessibility	Not part of the market
Risk	Presence of criminality; sense of risk	Health risk, dangerous elements	-

The complexity of urban systems requires multiple approaches to regeneration that work complementary at different scales and dimensions. The current challenge is also to integrate and simplify analysis and approaches to the study of different urban dimensions, to identify the most important starting points and enabling conditions (these points will be explored in the Section 3).

2.1.3 Is a Wastescape an Hyperobject?

In *Wasteocene*, Armiero considers waste not as a thing, but rather "as a set of socio-ecological relationships aiming to (re) produce exclusion and inequalities" (Armiero, 2021). In the previous Paragraph, we have defined a Wastescape as a multidimensional cultural landscape of waste, that have environmental, social and economic impact, generating disamenities. Thus, wastescape is not only a part of landscape, but an interweaving of waste systems.

In *The Ecological Thought*, Morton employed the term *hyperobjects* to describe objects that are so massively distributed in time and space to transcend spatiotemporal specificities, such as global

warming, styrofoam, and radioactive plutonium. Hyperobjects are entities of vast temporal and spatial dimensions which go beyond the human capacity for conception. He has listed five characteristics of hyperobjects (Hyperobjects, 2013):

1. **Viscous:** Hyperobjects adhere to any other object they touch, no matter how hard an object tries to resist. In this way, hyperobjects annul ironic distance, meaning that the more an object tries to resist a hyperobject, the more glued to hyperobjects it becomes.
2. **Molten:** Hyperobjects are so massive that they refute the idea that spacetime is fixed, concrete, and consistent.
3. **Nonlocal:** Hyperobjects are massively distributed in time and space to the extent that their totality cannot be realized in any particular local manifestation. For example, global warming is a hyperobject that impacts meteorological conditions, such as tornado formation. According to Morton, though, entities do not feel global warming but instead experience tornadoes as they cause damage in specific places. Thus, *nonlocality* describes how a hyperobject becomes more substantial than the local manifestations it produces.
4. **Phased:** Hyperobjects occupy a higher-dimensional space than other entities can generally perceive. Thus, hyperobjects appear to come and go in three-dimensional space but would appear differently if an observer could have a higher multidimensional view.
5. **Interobjective:** Hyperobjects are formed by relations between more than one object. Consequently, entities can only perceive the imprint, or "footprint," of a hyperobject upon other objects, revealed as information. For example, global warming is formed by interactions between the sun, fossil fuels, and carbon dioxide, among other objects. Nevertheless, global warming is made apparent through emissions levels, temperature changes, and ocean levels, making it seem as if global warming is a product of scientific models rather than an object that predates its measurement.

According to Morton, hyperobjects become visible during an age of ecological crisis and alert humans to ecological dilemmas. Although the concept of hyperobjects has been widely adopted by artists, literary critics, and some philosophers, it is not without its critics. In this research, wastescapes have been considered as systems of waste that are the product of a particular cultural perception. Thus, the theory of **hyperobjects** could support the interpretation of non-spatial wastescape characteristics that manifest locally and impact urban components.

2.2 The Netzstadt model: Physiological and morphological systems

Baccini and Oswald (1998) developed the Netzstad method to structure the study and analysis of multiple systems of landscapes. Urban landscape can be seen as a cultural landscape regulated by the metabolic relationships. Architecture and natural systems belong to different competences. Thus, the work of “Morphologists”, with architecture competences, and “Physiologists” with competences in natural and engineering sciences, are complementary and need a methodology to find a synthesis. Wastescapes study suit this approach, as they are made of multiple spatial and non-spatial systems where built environment and urban metabolism (UM) interplay through socio-cultural dynamics. The physiological and morphological components are in a unique system. Here, analyse just three resource systems that constitute them: waste flows, *wasted lives* (Bauman, 2004) and the wasted architecture in the built environment.

The processes that define the physiology of the city are dependent of the built environment and the architecture of the city itself. The countless human processes that contribute to determining the quality of urban life are themselves influenced by the built environment in which they occur. The relationships between things mainly trigger mechanisms of mutual, but not biunivocal, influence.

In this context, the production processes produced different forms of waste, whose recovery is at the centre of the paradigm shift toward circular city models. The Netzstadt approach to *new urbanity* (Oswald & Baccini, 2003) links between physiological and morphological systems and this method is adopted to structure the wastescape analysis. New Urbanity is mean as contemporary urban life of the majority of people. It can be recognized in urban architecture, large settlement patterns, in new rhythm of life, and, more recently, also in fallow lands.

The challenge in a design-oriented study is managing different economic, environmental and social systems is to simplify interdisciplinary subjects. In the last decades, scientists, architects, and planners have explored several methodological approaches to deal with urban metabolism and territorial/urban regeneration.

The Netzstadt (Net City) method stands for a **transdisciplinary work** through which *urbanity* can be analysed and evaluated morphologically and physiologically and redesigned in a new process.

The term Netzstadt is used to describe urban systems. *“The metaphor of the network is intended to make it clear that it is not a pyramidal hierarchy of individual settlements with a centre at the top, but a structure whose structure and properties can in part be compared with those of ecosystems”.*

The Netzstadt model consists of the following three elements:

1. **Nodes**: defined as places of a high density of people, goods and information.
2. **Connections**: that ensure the flows of people, goods and information between nodes.
3. **Scales**: various levels of scale within which territories can be spatially delimited and the nodes and connections identified.

Changing the observation scale allows different nodes and connections on the following higher scale to be aggregated to form a superordinate node and a node on the following lower scale to be broken down into sub-nodes and the corresponding connections.

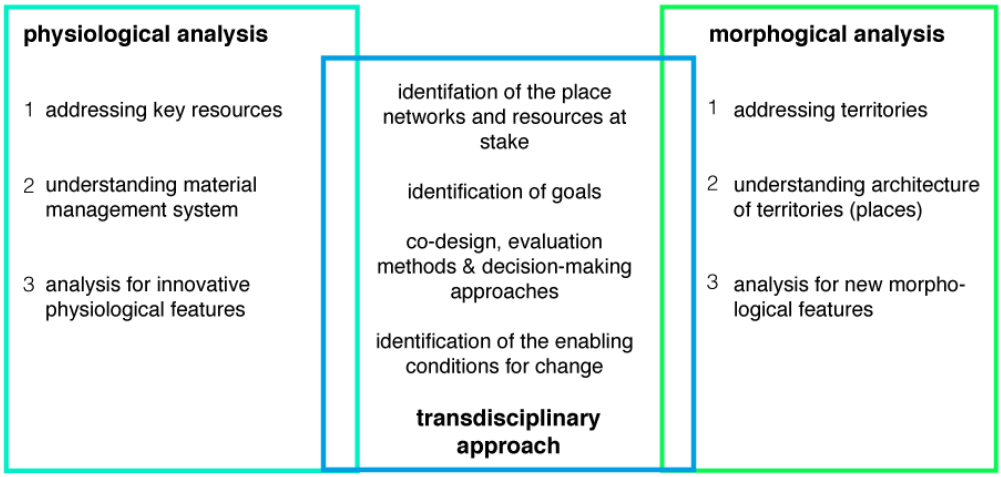


Figure 11. The Netzstad transdisciplinary approach.

The multi-scalar approach allow to classifying spatial units at five different scales:

1. The individual scale - the apartment as the smallest unit of urban life, that we indicate as **S** scale;
2. The local scale - the quarter that offers basic services for urban life and initial opportunities for identification with the **neighbourhood**, that we indicate as **M** scale;
3. The medium-scale - the municipality, the first communally organized and partially self-governing level, that we indicate as **L** scale;
4. The regional scale - it encompasses some municipalities for which major tasks in the educational, social, resource and transport sectors are solved centrally (federal states, departments, cantons etc., but also regions of the European Union), that we indicate as **XL** scale;
5. The national scale as a regional association, which gives itself the status of a sovereign state via a constitution., that we indicate as **XXL** scale.

In this study, the scale S is associated to the building and not to the apartment unit.
Different processes make the connections between these scales.
The Netzstadt method is understood as part of a strategy for developing urban systems. It includes both a morphological and physiological analysis of selected territories using specific analytical instruments. The method, therefore, requires **transdisciplinary cooperation between architecture, natural and engineering sciences**. It is deliberately kept open to integrating further disciplines (social sciences, economics, political science, anthropology, etc.).
The **morphological analysis** of territory is based in particular on topographical characteristics that can take place with a focus on six natural and cultural-historical attributes of the territory:

1. its coherence, which reflects the topographical context of the territory;
2. its recognizable and unrecognizable limits as instruments and indicators of social agreements and forms of organization;
3. its scale and magnitude, the assignments of which are often subject to normative and *zeitgeist*-related changes;
4. the tasks assigned to him, including the resulting conflicts of interest and social tensions;
5. its urban grain - a sculptural-plastic attribute of the territory that contributes significantly to the sensual identification of parts of the settlement.
6. its urban resistance - the relationship between the power of the existing and the power of change, which manifests itself in geological-material, climatic features and cultural-political constellations.

The morphological analysis of the Netzstadt method incorporates synchronous and diachronic investigations of six different types of territories based on their type of use: bodies of water, forests, settlements, agriculture, infrastructure, fallow land.
The physiological analysis pursues the goal of recording the appropriate physical resource balance of urban systems in combination with the morphological findings - to enable a qualitative and quantitative description of nodes and connections.
The recording of matter and energy flows lead to the representation of material balance systems based on the following essential resources: water, food (biomass), construction materials, energy.
The selected **physiological indicators** are included in the analysis:

- the density of inhabitants,
- the density of workplaces,
- the density of services,
- the density of institutions,
- workforce (flows),
- students (flows).
- metabolic resources can also be considered physiological components.

The Netzstadt method suits to supports the design work's analysis and structures to combine UM and urban spatial issues. A transdisciplinary approach allows the combination of the results of the two analyses. Oswald and Baccini also present a participatory method to co-design, the Synoikos Method, but here we only consider the analytic part of their approach. The topic of decision-making in co-design is object of the in the Section 3.
Thus, in order to explore two waste systems of wastescapes, the following Paragraphs focus on two specific physiological and morphological systems of wastescapes: The Urban Metabolism of waste and wasted architecture in the Italian context.

2.2.1 Waste metabolism and urban landscape

Urban Ecology deeply investigated Urban Metabolism (UM) over the last decades. The first approach to ‘’The Metabolism of Cities’’ was presented by Wolman (1965), coping with water and pollution. At the origin of metabolic studies is Marx's concept of social metabolism, that has been rediscovered recently (Foster, 2013), which concerns exchanges between man-made systems and natural ecosystems through labour. The Marxist conceptualisation of social metabolism described the materials and energy streams dynamics between nature and society and between different societies, shaping local economies. Over centuries, the metabolic rift between the environment and society has become so deep that human activities became a global problem. The negative impacts of pollution on the environment, ecosystems and humans manifest at all scales in conflicts.
In 2007, C. Kennedy and fellow researchers produced a clear definition paper claiming that urban metabolism is “the total of the technical and socio-economic processes that occur in cities, resulting in growth, production of energy, and waste elimination”. Coherently with social metabolism analysis, the UM and Environmental Justice conflicts are deeply connected. Environmental conflicts are all those global conflicts due to environmental depletion that affect local communities, that often struggle to

defend their lands and natural resources against the big corporation interests. Because mostly environmental struggles are lead bottom-up by place communities, Alier (2003) recognised the so-called phenomenon of the *environmentalism of the poor*, and more recently a global Environmental Justices movement (Martinez-Alier, Temper, Del Bene & Scheidel, 2016). Most of poor people live in marginal urban areas or in the countryside, where the most of environmental injustice occur. The EJAltas (2015) maps thousands of environmental conflicts worldwide, where the leaders are both women and men, peasants, mine or plantation workers, urban dwellers, indigenous representatives, and civil rights leaders. Waste management issues lead also to severe conflicts that the EJ Atlas mapped, and to socio-environmental threats and human health-related issues.

Urban Metabolism was defines for the first time by Wolman to describe “all the materials and commodities needed to sustain the city’s inhabitants at home, at work and at play”. **(**Broto, Allen, & Rapoport, 2012).

This unfair background show the importance of the improvement of waste management, that is the main goal of circular economy strategies. The integration of Urban Metabolism (UM) studies in spatial contexts through the new Circular Economic objectives is at the centre of the European political agenda. The circularity gap is still massive. Only 8.6% of the world's production activities are circular (Circle Economy, 2021), while the rest still follow linear and unsustainable paths.

Data on global waste production and treatments are alarming. The world generates 2.01 billion tonnes of municipal solid waste annually, with at least 33 per cent of that are not managed in an environmentally safe manner. Worldwide, waste generated per person per day averages 0.74 kilograms but ranges widely, from 0.11 to 4.54 kilograms according to consumptions. Though they only account for 16 per cent of the world’s population, high-income countries generate about 34 per cent, or 683 million tonnes, of the world’s waste (Kaza et al., 2018).

Each waste flow or stock is part of a supply chain (Figure 12).

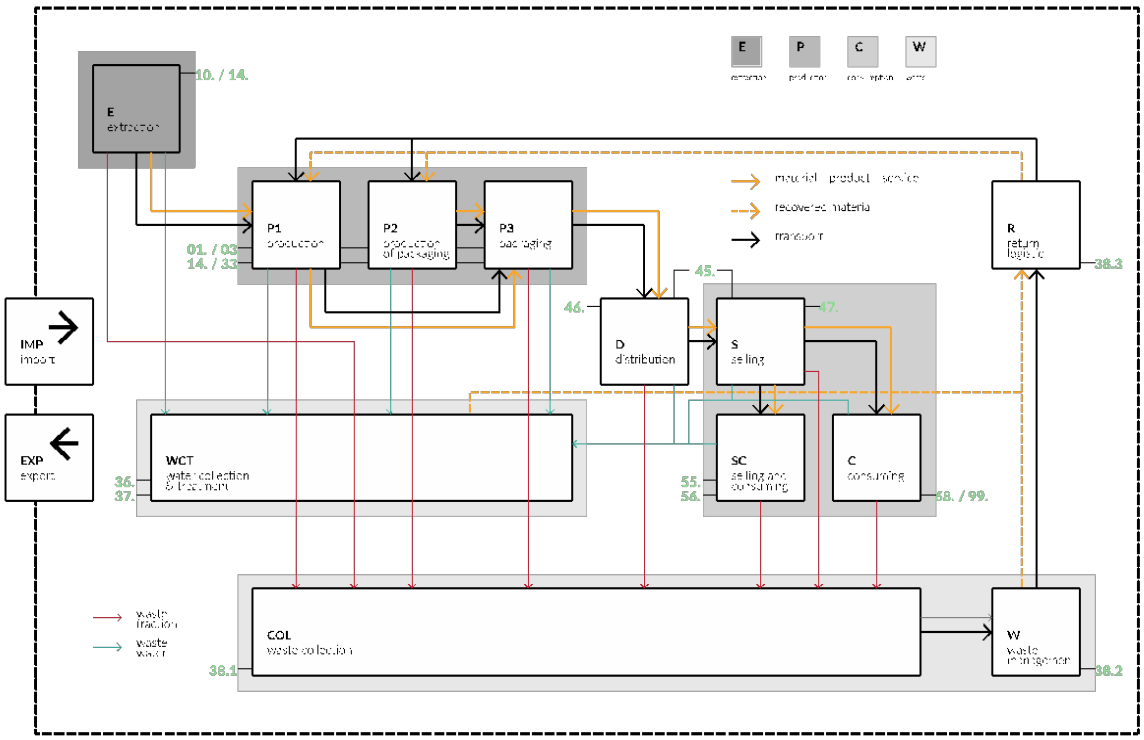


Figure 12. Supply chain model and NACE codes of economic activities. Source ---

A Process Flow Diagram of all waste fraction is constituted by:

1. Flow fraction: typology and amount; classified In Europe according to the NACE codes;
2. Waste producers: origin of the flows that can be Municipalities or Companies;
3. Treatment Plants (nodes of the process or destinations of the flows) provide intermediate or final processes and depend on the EWC of the fraction.

European Waste Catalogue classifies waste streams into 20 categories (Annex 2A): Each waste category (2 digits) includes sub-categories (4 digits) and the specific stream fractions (6 digits).
According to the Regulation of the European Parliament and the Council of 25 November 2002 on waste statistics (EC, No 2150/2002), Regulation (EC) No 2150/2002.
The EU Member States provides data on the generation, recovery and disposal of waste every two years. Data on waste generation and treatment are currently available for even reference years from 2004 to 2018.

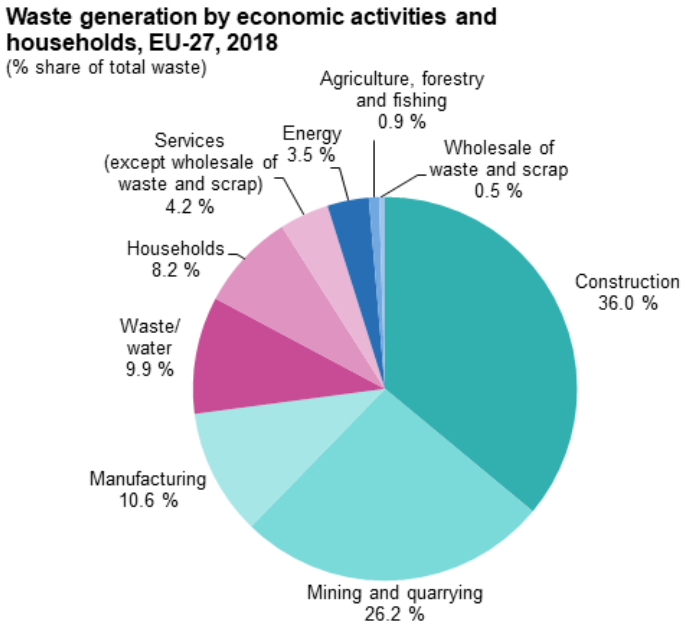


Figure 13. Waste generation by economic activities and households. Source: Eurostat.

Each economic activity produces several kinds of waste streams. Beside their composition, according to the productive activity, waste are classified in Municipal or Special Waste. They are subject to different collection systems. Municipal Waste includes households and SMEs with less than 10 employees whose waste is managed with household one. While industrial waste is mostly separated by fraction, MSW is much more heterogeneous. In Italy, material streams that belong to MSW are organic, metamaterial (plastic and metals), paper, glass and residual solid waste (RSW).
The definition of waste given by the European Union, defined as "any substance or object which the holder discards or intends or is required to discard" appears ambiguous (Directive 2008/98/EC).
Eurostat produces regular statistics on waste generation and treatment for the whole economy and on specific waste streams. Responsible consumption and production are part of objective 12 of the SDGs. Waste management is a central issue, and the low percentage of the separate collection alone is not the only problematic element.

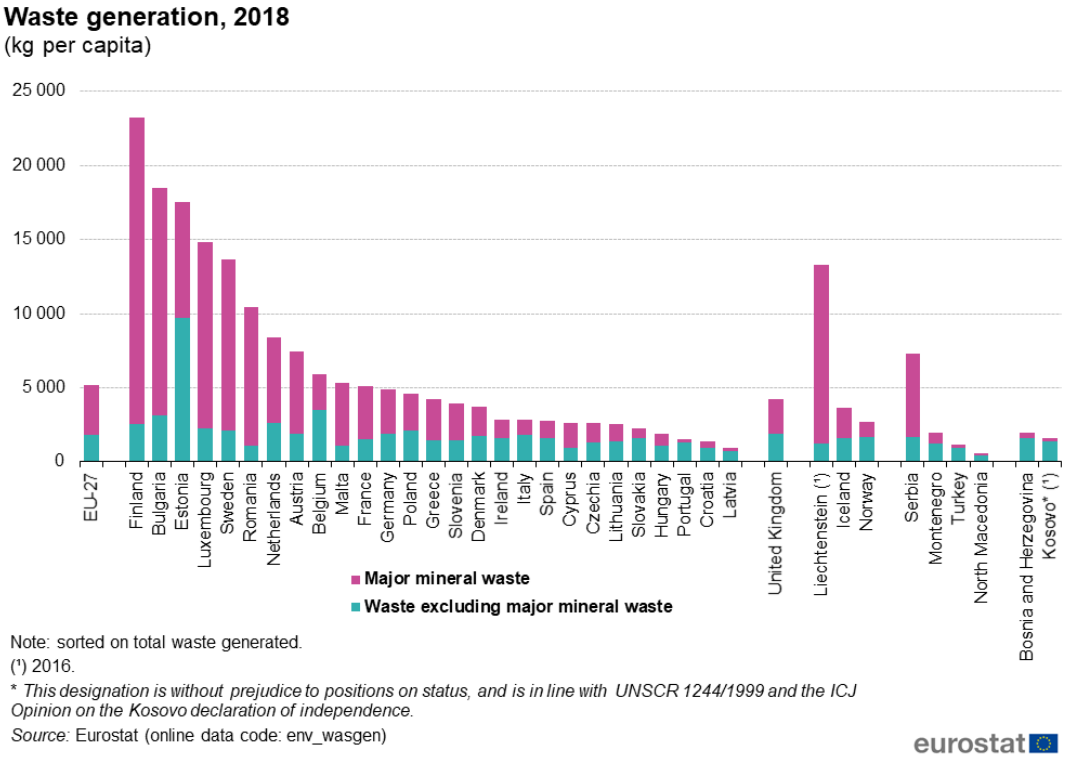


Figure 14. Waste generation in European countries in 2018. Source: Eurostat.

The value contained in the industrial zero-valued residues (Scheel, 2016) is recognized as a development driver in all schools of thought alternatives to the linear extractive economy, such as: green economy (Brockington, 2012; UNEP, 2013); systemic economy (De Kemmeter, 2013); circular economy (Ellen MacArthur Foundation, 2013); blue economy and ecological clustering (Capra, 2004; Pauli, 2010) and regenerative economy (Lyle, 1996). These approaches complement each other and support new circular chain models able to activate synergies between local realities, not only industrial ones. Through these new systems, it is possible to create new business opportunities, do urban regeneration, and introduce into society new cultural values related to Life Cycle Thinking. Urban metabolism studies offer the most multidisciplinary support to this systemic conceptual approach (Dijst et al. 2018).

The management of production and material disposal chains is deeply influenced by consumers and design choices, both on a small and large scale, from interior design to spatial and landscape planning. In this direction, the state of the art on studies that aim at integrating UM and the spatial dimension of landscape planning and design is relevant for the transition to circular cities. A Systematic Review (SR) of the literature (Mazzarella & Amenta, 2021) shows new challenges required for designers and planners for understanding and managing sustainability and CE in urban landscapes.

Thus, the need for urbanists, architects and decision-makers to solve the lost balance and equilibrium between resource management and healthy living conditions for all means to focus on several aspects simultaneously by working throughout different scales and from different perspectives to territories.

First of all, the functionality of the UM (Ferrão & Fernandez, 2013; C. Kennedy, Pincetl, & Bunje, 2011; Christopher Kennedy, Cuddihy, & Engel-Yan, 2007; van Timmeren, 2014; Wolman, 1965) can be explored. This topic could be done by understanding the effective ways to implement a fundamental shift from the actual linear model to a circular one (Amenta et al., 2019; Lucertini & Musco, 2020).

The operational capacity of the urban landscape depends on the nature and management of its metabolic flows, including the flows of people. Permanent and temporary dwellers of an area determine the economic activities in urban areas and vice-versa. Buildings define the inhabited environment in its material component, including architecture, infrastructure, and every area of the urban landscape.

Altogether they define the urban ecosystem, which strives for circularity to be able to be more resilient over time.
Secondly, for implementing an actual transition to a circular city model, there is the need to apply a closure of production processes through looping actions by improving and connecting supply chains, recycling avoidable waste, and transforming them into new resources. This approach is founded on the CE conceptualization (Geissdoerfer, Savaget, Bocken, & Hultink, 2017; Kirchherr, Reike, & Hekkert, 2017; Korhonen, Nuur, Feldmann, & Birkie, 2018), which initially was developed for industrial processes and did not have a spatial dimension yet.
The Systematic Review (SR) of last 10 years' literature (Mazzarella & Amenta, 2021), on UM and study areas of circularity and design aimed to establish an overview of the current research on UM studies over the last ten years. This has been done with a specific focus on urban studies oriented towards the transition to the CE. The approach identified in this paper follows the 4-steps methodology of the reviews set out by scholars like Yigitcanlar (Yigitcanlar et al., 2019) and Md. Golam Mortoja (Mortoja, Yigitcanlar, & Mayere, 2020). Both ways are consistent with the objectives of this research, as they are SRs based on qualitative and not statistical analysis and have a research question related to city and studies on the territory. Thus, the research methodology of the SR carried out follows the following steps (Tab. 1): (1) Identification, (2) Screening; (3) Eligibility; (4) Inclusion.
The identification step (step 1) was about the selection of appropriate keywords. The keywords identified are "urban metabolism", "circular economy", "circular city", "planning", "landscape", "architecture", "design", "wastescape". They were determined and set as search string criteria to address the main research question by pointing out significant topics in the urban planning and design for the transition to circular cities. The research has been run through the Scopus database considering the last 10 years (2010-2020). The Boolean search has been used as an effective way for information retrieval, allowing users to combine keywords with operators such as AND to concatenate, NOT to exclude, and OR to include either all the keywords (Bello Aliyu, 2017). It was set up as: (("urban metabolism") AND ("circular economy" OR "circular city" OR "planning" OR "landscape" OR "architecture" OR "design")), to 15 September 2020. This search initially produced 323 results (step1). As inclusion criteria, only scientific articles published in English scientific journals indexed by Scopus and available online were selected. Thus, books and reports were excluded, reducing the number of papers to 254 results in the screening (step 2).

Table 3. Literature selection procedure.

N.	Methodological step	Description
1	Identification. Definition of search criteria and literature database	Records identified through the database Boolean search (("urban metabolism") AND ("circular economy" OR "circular city" OR "planning" OR "landscape" OR "architecture" OR "design" OR "wastescape")) Database: Scopus (n= 323).
2	Screening. Funnel selection from the total number to those read and analysed for relevance to the research question	Records excluded (books, chapters, conference proceedings, editorials, articles not in English) (n= 250 Scopus).
3	Eligibility. Critical selection of articles on the basis of their relevance to the topics related to the research questions	Full articles assessed for eligibility (n=44) [The records excluded have been considered less relevant to the research aims].
4	Inclusion. Selected articles	Full extra articles included in qualitative analysis (n=5). The total number of selected articles (n=49).

Eventually, from the resulting matrix, all titles, abstracts and keywords were read using the eyeballing technique to elect some relevant articles deemed useful for answering the research question. Following the selection criteria (Tab. 2) the final group of articles has been outlined.
Excluded studies correspond to those that are not immediately related to the disciplines of urban studies and design of the built environment, being, as instance, merely associated with resource management, without exploring at all the spatial dimensions. As an example, most articles that deal exclusively with solutions for the engineering management of water and energy have been excluded from this study, even though the authors acknowledge the relevance in the context of urban planning and metabolic processes. This aforementioned selection aims at restricting the analysis to some significant issues and aspects related with the transition towards circular cities. In addition to exclusion criteria, the SR foresees a subjective selection made by the authors, which could be a weakness point in the methodology by excluding articles that are apparently not coherent or interesting in relation to the research question (Snyder, 2019). The third step resulted in a group of 44 articles. Finally, with respect to the group of selected articles, it was considered appropriate to include some articles from the literature that indirectly emerged from the search carried out. The final number of articles studied and analysed was therefore 47.
The papers identified were read and reviewed according to criteria identified (Table 2). Following the research question, this SR pinpointed the main fields of investigation on the UM topic, addressing it either directly or indirectly.
From the aforenoted identified criteria, the SR has been developed. Therefore, the selected papers (i) address the key issues and the open questions on UM in recent urban studies, (ii) explore developed and tested approaches and tools useful for a better management of UM in urban contexts, and (iii) define the still open topics dealing with the UM research in urban studies and research projects, as well as (iv) explore the paths to follow for the transition towards circular cities. They raised numerous topics, comprising theoretical and methodological issues, instruments of investigation and applications in case studies. At the end of the iterative study process, the subjects have been classified in five categories:

1. Theories and goals, including theoretical developments, targets and approaches to the topics;
2. Planning and design approaches, materials, methods and tools, that mainly focus on urban issues considering UM;
3. UM approaches, materials, methods, and tools, that start form resource management to deal with spatial planning or design;
4. Interdisciplinary research and applications, that combine the previous categories (2) and (3);
5. Open issues: the unsolved problems raised from research, that can be the basis for future investigations.

The analysis has been carried out with the platform Atlas.ti (Scientific Software Development GmbH, 1997). It is a software supporting qualitative analysis (Hwang, 2008), that also allows the construction of clusters of codes, that are resembling categories of subjects. Codes are specific words by which the most common and important subjects of the papers have been highlighted, after quoting. Grouped in the five categories pointed out, the codes (i.e. subjects) have been identified both in a deductive approach, based on ex-ante considered research questions, and in an inductive approach, resulting from the study of the selected papers. The final 80 subjects coded in the study of the papers in Atlas.ti were grouped into the mentioned five groups (i.e. categories). The system of relations linking the different subjects is expressed through a semantic network of subjects, in a global vision on the landscape of literature.
While studies and research in the specific fields of UM and urban studies use different materials and methods, the research topics in the reviewed literature mainly include studies and applications that combine several fields of knowledge; moreover, they primarily pose the challenge of integrating tools

for analysis and support of different disciplinary fields. To carry out the SR, the subjects identified in the study have been grouped into five wide categories (Fig.1): (1) theoretical issues, (2) UM materials and methods, (3) Planning and Design materials and methods, (4) interdisciplinary studies and applications, (5) open issues.

Figure 15. Codes of the semantic network.

The theoretical frameworks considered in the literature review identify similar theoretical backgrounds. The objectives of sustainability, resilience and/or circular city pursue the common goal of improving environmental quality and well-being in urban areas, and reducing negative impacts on the surrounding environment (Agudelo-Vera, Leduc, Mels, & Rijnaarts, 2012; Amenta & Qu, 2020; Roggema & Alshboul, 2014; Saha & Eckelman, 2017; Serrao-Neumann, Renouf, Kenway, & Low Choy, 2017; Van den Berghe & Vos, 2019; Venkata Mohan, Amulya, & Annie Modestra, 2020). This is consistent with sustainable development and green growth ideas, both at the macro and the micro scale. In fact, none of the papers reviewed considers the concept of degrowth or other CE diverse visions of the sustainability concepts (Calisto Friant, Vermeulen, & Salomone, 2020), neither they put current economic growth models into question (Hickel & Kallis, 2019). Social issues, urban equity and social fragility are considered sometimes together with urban planning than resource management (Kasper, Brandt, Lindschulte, & Giseke, 2017; Ramaswami et al., 2012; van Timmeren, Zwetsloot, Brezet, & Silvester, 2012). Social dimension of CE is also recognized as an important field of study to be further explored (Kennedy et al., 2011). The Multi-Scale Integrated analysis of Societal and Ecosystem Metabolism (MuSIASEM) is also considered significant since it put together the social study of changes of human time in labor and land use patterns (Lu et al., 2016).

The increasing relevance and complexity of the UM concept is due to the many different disciplines which it encompasses, and also to the several opportunities for sustainability implementation in cities (Broto et al., 2012), but synergies between networks are increasingly required. Even if Circularity is not always the core of UM studies, the multidimensional benefits over the dominant model of linear metabolism are evident (Agudelo-Vera et al., 2012; Broto et al., 2012; Chrysoulakis et al., 2013; Ivanović, 2020; C. Kennedy et al., 2011; Leduc & Van Kann, 2013; Roggema & Alshboul, 2014). Theoretically, Van den Berghe & Vos (2019) recognize that the concept of circularity could balance both functioning and design of cities., but the dichotomy between design and functioning is paradoxically accelerating the use of space as a location, more than the organization of space in the urban transition toward circularity (e.g. in their cases studies in the Netherlands).

Urban and landscape planning and design studies implicate multiscale and multidimensional approaches. It is relevant to carry out the metabolic analysis at regional planning (Galan & Perrotti, 2019) as well as at different scales including urban metabolism principles in decision making (Longato, Lucertini, Fontana, & Musco, 2019) and in design.

Land use changes the impact of residents and the metabolism of an area (Wang, Chai, & Li, 2016), while land use planning and design can be a significant tool to improve the Circularity of UM. For this reason, impact evaluations depend on urban form, functions and building stock (Ivanović, 2020). Looking at which components of the urban landscape and which urban related topics are most investigated, through this study emerged that they are regional infrastructures, green infrastructures (Perrotti & Stremke, 2020), buildings (Arora, Raspall, Cheah, & Silva, 2020), commercial centers (Sgobbo, 2017), city ports (Cerreta et al., 2020; Gravagnuolo, Angrisano, & Fusco Girard, 2019; van Timmeren et al., 2012), urban topics and landscape design (Juwet & Ryckewaert, 2018; Marin & De Meulder, 2018a), urban landscapes (Pistoni & Bonin, 2017) and wastescapes (Amenta & van Timmeren, 2018; Castigliano, De Martino, Amenta, & Russo, 2020).

To assess projects performances, ecological indicators for UM (D'Amico, Taddeo, Shi, Yigitcanlar, & Ioppolo, 2020), Ecosystem Services (Elliot, Almenar, Niza, Proença, & Rugani, 2019; Penazzi, Accorsi, & Manzini, 2019; Perrotti & Stremke, 2020), and circular cities indicators (Cerreta, di Girasole, et al., 2020; Gravagnuolo et al., 2019) are analysed in many cases as tools for monitoring the performance of plan and project choices.

Many of the software and platforms for spatial - decision support systems (DSSs) use GIS-based tools for landscape mapping and spatial data management. For instance, the Spatial Allocation of Material Flow Analysis (SAMFA model) is a DSS to allow multiple stakeholder to identify significant material and energy use in the development of targeted planning strategies, and visualising different scenarios (Roy, Curry, & Ellis, 2015). In a similar way, the Geodesign Decision Support Environment (GDSE) is a Spatial DSS based on collaborative process, that enable multiple stakeholders in resource flows and stock, including materials and waste management in spatial contexts, by implementing eco-innovative solutions for looping actions at intermunicipal scale (Arciniegas et al., 2019; Remøy, Wandl, Ceric, & van Timmeren, 2019). These kinds of tools represent significant Spatial DSSs to be further implemented in future developments, and combining evaluation maps for the spatial circular regeneration of urban areas, landscape and wastescapes (Cerreta, Mazzarella, & Somma, 2020). The studies analysed consider the social dynamics and the social involvement in planning in different ways: the co-creation processes in Living Labs, allow stakeholders and local actors from private and public sectors to take part in urban strategies development oriented to circularity (Amenta et al., 2019; Remøy et al., 2019), study workshops with students (Amenta & Qu, 2020), or involving stakeholders in real case studies implementing eco-solutions.

The basis of UM studies is the awareness of the limitedness of ecosystems and the optimisation of their available resources. Metabolic resources, i.e. energy, water, and materials, and in the CE perspective also all related waste, production and consumption need to be assessed. Thus, the Life Cycle Assessment (LCA) and the Material Flow Analysis (MFA) are the main methods for estimating the

impacts of supply chains and balancing the resources used by a system. In urban circularity, materials stocks and flows management need to be mapped and described, to make them available to second uses. Harvest of resources techniques are widely explored, for water and energy management (Agudelo-Vera et al., 2012), for urban mining (Kuong, Li, Zhang, & Zeng, 2019) and the sustainable construction industry (Hossain, Ng, Antwi-Afari, & Amor, 2020); they are the premise for a resource-based design (Jongert, Nelson, Jongert, & Nelson, 2011).
Energy issues are at the heart of urban studies aiming for greater urban sustainability (Juwet & Ryckewaert, 2018; Lombardi & Trossero, 2013; van Timmeren et al., 2012). Beyond energy, the available resources are water, materials and, from the circular economy paradigm, waste, but also space, land and the built environment in general. The management of resource flows and stocks affects every spatial fragment of the city and landscape and determines its environmental performance.
The interdisciplinary studies and applications address resource management in spatial contexts, both for efficiency and for the implementation of sustainable technologies and the best urban form and design.

All the identified subjects can be analysed through the semantic network of relationships (Fig.2). The latter has been assembled by linking the 80 codes identified in the five groups, defining their mutual relationships, in a semantic network. Some subjects are key concepts in the perspective of reviewed studies: the relevance of circularity, the centrality of the resource flows and stocks and their integration in planning, the idea of space as a resource, the evaluation of land use functions, finally tools and DSSs that link UM assessment with spatial planning.
Starting from a UM interpretation and centralizing it in the objective of this research, the relationships emerging from the semantic network show a convergence of research in addressing the multidimensional and multiscale topic of resource management with multiple tools, with the aim of pursuing sustainable development.
This research has investigated the (still open) research fields which have been focusing recently on the transition toward circularity. To do so, through a Systematic Review of the scientific Literature of the last 10 years, it analysed a group of papers that addressed the issues of Urban Metabolism (UM) management in the spatial perspective of the Circular Economy (CE).
Circularity and sustainability are seen, in this perspective, as two increasingly overlapping wide goals and associated with systemic and regenerative design objectives in studies with a holistic approach to metabolism.
The analysed literature revealed that the main theoretical and open issues about the integration of resource metabolism management in urban studies and associated applications are in the UM material management and related methods of material balances (input-output, MFA), in impact assessment (environmental assessments, LCA), that can be combined with multiple approaches, methods and tools for planning and design. Some researchers have combined several methods to create spatial decision support tools, useful for the assessment of metabolic resources (MFA) and assessment of impacts of supply chains (LCA), and considering land use functions, which highlight the resources available on a certain territory.
In multiple systems, networks and synergies lead to the consideration of multiscale and multidimensional approaches. According to the different case studies, strategies for CE are applied both in bottom-up (as it is happening for circularity in China) and top-down strategies (through e.g. workshops and co-design (Urban) LLs in Europe).
The disciplinary integration is supported by GIS tools, which allow to manage spatial data, and which can be combined with the study of urban and landscape morphology, by integrating sustainable urban technologies, spatial planning, regenerative design, and green infrastructure design.
Some model framework and tools as general methodological approaches to CE implementation and DSSs have been developed aiming to clarify the links in processes and to simplify the understanding of

the resource at stake. While the mapping of land use functions and spatial data are globally used systems in planning, conversely, the mapping and understanding of metabolic resources is still fragmented and depends on the quality and quantity of open data available in different geographical areas. To cope with this issue at the local scale, mapping systems for resource harvest can significantly support urban mining and resource use optimization. The reviewed studies clarify that resources stocks and flows for circular cities are both metabolic and spatial. Thus, resource-based design, or design with flows, is possible through the tools and integration of methods, developing interdisciplinary studies and learning from applications in different case studies. Good practices, eco-solutions and projects, bio-based solutions, sustainable technologies are not only of concrete value, but they also represent a learning experience. The social dimension is highly present in these processes, whether considering human activities, labour productivity, the effects of planning policies on inhabitants, or involving different public and private stakeholders in the Urban Living Labs environments. Much of the application and research experiment by combining the classical methods of metabolism study (MFA, LCA, energy balances) are connected with different planning methods (models, GIS, collaborative/participatory planning, mapping, spatial study projects). Theoretical research mostly tends to define new frameworks to facilitate synergies and networks.

Given the delicate balance of coexistence between anthropogenic dynamics and the environmental system, urban challenges and metabolic processes should be planned as integrated processes in the transition towards circular cities. UM resources shape the scenarios of human activities that determine trade and land use functions. Also, metabolic flows are raw materials for constructing sustainable landscapes and urban environments.

The challenges related to that are multidimensional: on the one hand, national and local policies are still unclear to circular (material and territorial) resources management; on the other hand, many large cities are oriented towards sustainability but not ready yet to comply with the many challenges of the CE approach. Besides, cultural aspects do not yet seem to be sufficiently and directly addressed yet in resource management discourse for UM optimization in spatial contexts and urban environments.

If we imagine the issues around metabolic flows from a linear economy perspective, upstream of the problem of urban environmental impacts is extractivism, the use of energy from non-renewable sources. At the heart of the problem is the management and use of available resources. Downstream of the process is the production of emissions and waste. To reduce extractivism without lowering the standards of our lifestyles, it is necessary that new resources and materials to be used come from renewable sources and from all waste that can be recovered and reintroduced into metabolic systems.

Parallel to the problems connected to the ordinary management of declared waste streams, the illegal management of waste was of great importance in terms of impacts on the global trades (Hebel et al., 2014). In the global wastescape of waste flows, Baumann also talked about *Wasted lives.* In *Modernity and its outcasts* (2004) argue that the production of 'human waste' or discarded, surplus or surplus human beings is a result of modernity. Since every project aimed at building an order involves eliminating unnecessary parts, modern society has produced an organisation in which different social groups and individuals have been periodically marginalised. These individuals have been rejected by the social structures in which the state allows people to live normally. The social problems defined in spatial terms makes thinking about and administering poverty based on questions of “social mix”, “ghettos” and “sensitive neighbourhoods”. These categories do not only involve the risk of obscuring the mechanisms of domination, whether it is economic, social or racist (Tissot and Poupeau, 2005).

2.2.2 The wasted building stock in Italy

Wasted building stock is the W4.1 wastescape category of to the wastescape classification of REPAiR. The morphological systems of wastescapes are formed all the components of the built environment that constitute the *body* of that urban landscape.
The wasted unfinished and abandoned buildings are temporarily discarded, but:

22. they have been (or can be) dwelled in,
23. they constitute an important stock of building materials
24. they become landmarks in the urban landscape,
25. they host squats or spontaneous activities, and are unofficially used,
26. they are flexible to host many functions either negative (such as trafficking or dumping) or positive for the city (shelter for the homeless, spaces for urban creativity).

Unfinished and abandoned buildings have multidimensional impacts of urban wastescapes. They constitute a Physical Geography (REPAiR, 2017) and host a Human Geography, thus, they directly modify the physiological and morphological systems (Oswald & Baccini, 1998) of the urban landscape.
The issue of discarded and unfinished contemporary architectural heritage is a contemporary theme in architectural research of some European countries like Italy and Spain, where this phenomenon is spread. The Spanish pavilion "Unfinished" won the Golden Lion at the 57th Exhibition of Architecture at Venice Biennale deepening into this topic.

Unfinished and abandoned architecture is a widespread phenomenon also all over Italy. Indeed, in March 2013, the Ministry of Infrastructure and Transport (MIT) published the regulation setting out the procedures for the compilation of the register of unfinished public works (Ministerial Decree 42/2013). A specific system called SIMOI (Information System for Monitoring Unfinished Works - *Sistema Informativo di Monitoraggio delle Opere Incompiute*) (SIMOI website) has been set up to manage and publicise the information collected. It is the result of collaboration between the regions, through their regional public contracts observatories, and the Ministry of Infrastructure and Transport.
The art collective of Alterazioni Video Unfinished architecture (Arboleda, 2016) promotes the study and research of the Italian *incompiuto* (unfinished), that they define as an architectural style. Recognizing the high level of diffusion of the phenomenon of building stock abandonment, "Incompiuto Siciliano" has been theorized as the birth of a new style, a new architectural movement (Alterazioni Video, 2008). It is composed of architectural and infrastructural works whose construction has been arrested, and which can be observed throughout the entire Italian peninsula. They are all publicly funded, and for a variety of reasons (design errors, political decisions, inaccurate cost estimates, contractors' bankruptcies, evident disregard of building regulations, the disappearance of funds, etc.) their construction has been interrupted, leaving behind a series of "ruins in reverse".
The statements of the "*incompiuto siciliano"* manifesto are:
1. Incompiuto siciliano has been the key to interpreting public-sector architecture in Italy since the second world war.
2. Unfinished projects are the ruins of modernity, monuments born of laissez-faire creative enthusiasm.
3. Incompiuto siciliano developed into an incisive, radically different addition to the landscape. The

process by which unfinished public buildings come into being celebrates contemporary man's conquest of the landscape.
4. Incompiuto siciliano is postulated on the partial execution of a project followed by continual modifications that generate new spurts of activity.
5. Natural vegetation interacts synesthetically with incompiuto siciliano, re-appropriating sites and redefining the landscape.
6. Reinforced concrete is incompiuto siciliano's constituent material. Its colours and textures are determined by the ageing and weathering of materials.
7. Inincompiuto siciliano the conflict between form and function is resolved. Lack of function becomes a form of art.
8. Incompiuto siciliano musters and reassembles metaphysical places of contemplation, thought and the imaginary.
9. Incompiuto siciliano has its own ethical and aesthetic foundation.
10. Incompiuto siciliano is a symbol of political power and artistic sensibility.
The first Italian unfinished public works census was conducted in 2013, counting more than 500 stopped contracts. National regulations have implemented an annual census to update the first one (Prizzon & Rebaudengo, 2015)
At the same time, in Italy the trend in land consumption is constantly growing. In 2019, 1741km^2 of soil was consumed (ISPRA, 2019) and at the same time the whole country is rich in underused, unused, unfinished or abandoned buildings. There are 696 unfinished works in Italy which are considered unrecoverable and unusable for use. They are catalogued on the basis of location, with maps at national level and in-depth studies at regional level, year of construction, percentage of completion, type, size and cost. In particular, the last two criteria highlight the scale of the phenomenon, beyond the sheer number of works, which is in any case very significant: the total cost incurred by public bodies, amounting to 7.389 billion euro, and the physical size of the constructions, which is over 2,200 hectares (Gambaro, 2020).

Figure 16. A map of unfinished buildings in Italy. Source: incompiutosiciliano.com

At the same time in Italy, in 2018, the police discovered 6,578 crimes related to abusive constructions. Illegal buildings account for 23.4% of total environmental crimes immediately after waste traffic and animal crimes. The regional primacy is in Campania. Almost half of the illicit, 48.2%, is concentrated in the regions with traditional mafia presence (Campania, Puglia, Calabria, Sicily). At the provincial level, the most critical situations are Avellino, Naples, Cosenza, Salerno and Reggio Calabria. Alongside the new illegal construction, which CRESME (*Centro Ricerche Economiche Sociologiche e di Mercato nell'Edilizia* - Sociological and Market Research Center in Construction) estimates in around 17,000 new outlaw buildings, including the construction and expansion of existing buildings, the scourge of the old one survives, which is not removed even when diminutive demolition orders strike it. According to a study conducted by Legambiente on Italian Municipalities, from 2004 to 2018, in Italy, 80% of the demolition orders issued are not executed, given that in Campania, it is even 100%.
Rebaudengo, Innocente, & Crisafulli, A. (2018) analysed that in Italy the “opere fredde” are about 80% of the unfinished works. The so called “opere fredde” are those investments that do not provide a return on the initial investment. Besides the economic side, this building stock is a massive waste of resources of material and space. Their reconversions would need a change of use, attracting public or private capitals (Rebaudengo et al., 2018).
What can be done with unfinished buildings?

1) terminate, where possible, if the completion has a reason. It’s impossible to complete all of the Italian unfinished and, without a doubt, they’re not necessary at all.
2) reuse, by changing the destination of use, adapting to current needs;
3) demolishing, when it is possible to cover costs of demolition, waste disposal, renaturalization with land reclamation;
4) leaving them as they are, trying to intervene to a zero degree, and opening them up again to trade with the rest of society. The unfinished works are inaccessible to anyone. Therefore, the natural and own portions of territory subtracted from the net of the relations.

Beyond the pure idea of eco-efficiency, in the research on parasite architecture, Marini identifies waste architecture as places of semantic potential for development. Here, parasite architecture can be grafted by creating new systems. In contrast, the architecture in use has to deal with architectural identity and language and integrate with the existing function. The architectural waste, in this perspective, actively enables the grafting of new systems given by new interactions with the parasite architectures (Marini, 2008).

Conclusions

Section 2 explored the concept of wastescape. Research on wastescapes has recently emerged in the recent scientific literature in urban studies, but it derives from a long tradition that has its roots from wastelands to drosscapes.

In the REPAiR project, the wastescape was defined as a part of the landscape discarded by productive urban dynamics and abandonment and degradation. A classification of wastescapes as landscapes of waste is based on spatial categories.

Analysing the concept from the etymology of the term, the *waste-scape* concept has been further interpreted as a multidimensional cultural landscape, composed of as a set of different and multi-scalar waste systems that take place in urban and per-urban areas. Considering the interplay between metabolic flows, the built environment and people, through economic activities within the urban ecosystem, a reference method has been detected to deal with the study of such different urban dimensions. The Netzstadt model was defined by Oswald and Baccini to integrate multiple dimensions of landscape study together with the natural science. The Netzstad method distinguish morphologic and physiologic features of urbanity.

The waste systems considered in the study are the material and built environment waste and society. These systems occur in urban contexts and impact the liveability and the good functioning of the city areas. In this chapter, the wastescape has been defined as a man-made waste system consisting of subsystems of material and immaterial wastes.

Material and immaterial components form the physiological and morphological systems explored: the Urban Metabolism (UM) of waste and the wasted Built Environment (BE), particularly widespread in Italy with unfinished building stock, are the waste systems considered in this study. Modern society and its outcasts is not directly investigated, but social inclusion is considered central in the wastescape regeneration processes.

In the next chapter, the study will focus on the evaluation of these systems for their regeneration.

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3 WASTESCAPE EVALUATION

Objectives, criteria and methods

Photo 3. Shirley Tse, Negotiated Differences, 2019.
From the Exhibition Stakeholders: Hong Kong in Venice, the 58th Venice Biennale.
Courtesy of M+ and the artist, photo by Ela Bialkowska, OKNOstudio

Shirley Tse sculpture, *Negotiated differences,* tells the story of connections in the production of culture, creativity and community cooperation. A series of very different pieces, combined in various ways, create lattice shapes and activate space through their connections. How did the artist join these pieces? And why? This section works with a similar approach.
In the previous section, the wastescape has been examined and defined by detecting some significant *pieces* of the issue, i.e. kinds of waste systems. In Section 3, why and how to join those *pieces*.
The second research question aim at identifying regeneration approaches and tools.: **How to evaluate a wastescape?** Furthermore, **how to support a wastescape regeneration process?**
The wastescape evaluation and regeneration presents two main issues. First, different materials require different evaluation methods. Secondly, urban regeneration processes in the framework of circular city need decision-making approaches, that the abovementioned methods and tools can support.
The materials of this study have been recognized in two macro-categories: urban physiology and morphology. Wastescape regeneration is evaluated by defining goals, evaluation criteria, and suitable evaluation methods to support collaborative decision-makings. Thus, evaluation tools and methods works as decision support systems (DSS).
This Section opens framing theoretically the Circular Economy paradigm and the Circular City models and objective, in the Chapter 3.1. The values and strategies of circularity are presented. As wastescape is identified as a multidimensional cultural landscape, Chapter 3.2 points out evaluation criteria for urban landscape and wastescape evaluation. Finally, Chapter 3.3 presents some methods and tools for the evaluation of the waste systems object of this study: Solid waste and wasted architecture.
Participation in decision-making foresees the pure consulting, but collaboration includes the active engagement. The latter is harder to manage but it creates the conditions for more effective changes of long term sustainability.
Zero waste(scapes) is a goal of circular cities.
This target can be achieved with strategies of collaboration in decision-making, that is a challenge of circular cities based on the *doughnut* model.
The evaluation wastescape can provide results and insights to support decision-makings for the circular city strategies. Also, who is involved in the decision-making is a crucial point in circular, open and democratic cities. The involvement of multiple actors to collaborate in the urban regeneration and strategies implementation is tough. For this reason, this research also consider the decision-support systems as fundamental tools of wastescape regeneration. The Geodesign method and multiple criteria decision analysis are, consequently, presented as tools that can also interplay for this purpose.

3.1 Circularity

In the natural ecosystem, waste is food for the ecosystem itself, or more simply it does not exists. When we talk about waste, generally the reference is to material waste, i.e. the so-called rubbish. From the industrial revolution onwards, and then with the mass production of the economic boom after the Second World War, economic production has taken on an ever-increasing dimension based on a linear economy model of make - take - dispose. The consumer society has produced a mountain of waste, which is one of the (dramatic) monuments of our age. Waste, indeed, has an ethical significance in everyday life (Hawkins, 2006). Most of this material is something that could reused. If we follow the life cycle of a good, we can assess its full impact in environmental, economic, and in social terms. These assessments make it possible to reconstruct the entire chain of all the raw materials, production processes and transport that have contributed to the creation of a consumer good, whose reuse or end-of-life has environmental, economic and social impacts as well.

Waste disposal can take place in landfills, through incineration and waste-to-energy or recycling. Circularly, they can generate new values, goods, resources and possibilities. To do so, new forms of collaboration for knowledge management, planning, and design enable context for the co-creation and regeneration process.

In December 2015, the European Commission launched the “Closing the loop. An EU action plan for the Circular Economy” (EC, 2015). The circular use of resources rwould reduce the input and output resource flows in the urban metabolism (UM) framework. The monitoring of the UM enables the planning of local circular economy actions aimed at reducing environmental impacts. Recovery, reuse and recycling are productive sectors that would be strengthened by these actions, but the economic interests of the mining and waste management sectors would be partly compromised.

The transition to sustainable urban systems within the ecosystem requires profound changes that can gradually occur, requiring an integrated and systemic view of all the stakeholders and issues involved.

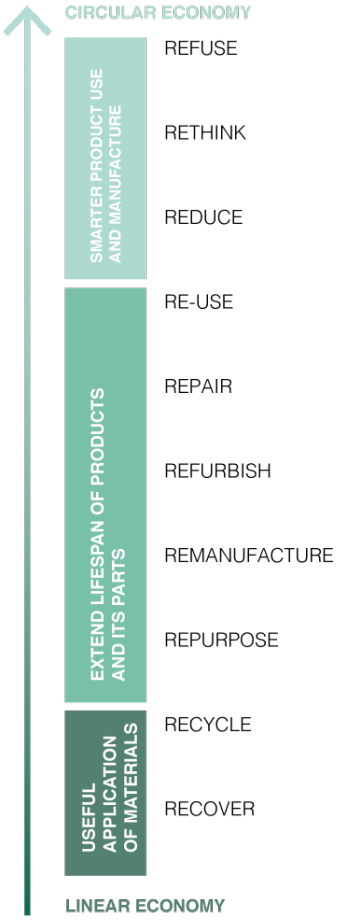
3.1.1 Toward the (Social) Circular Economy: Definitions, goals, and open debates

The concept of CE finds its main origins back in the 1970s. It has been continuously enriched over the years by the contribution of different authors belonging to different schools of thoughts (EC, 2014): Green and Bio-Economy (D’Amato et al., 2017), Cradle to Cradle (Braungart & McDonough, 2009), Industrial Ecology (Ayres & Ayres, 1996), Regenerative Design (Lyle, 1994), Doughnut Economy (Raworth, 2017) and others.

A unique and precise definition of a circular city is missing (Paiho et al., 2020). However, there are several examples of European cities moving towards it. Notably, the city of Amsterdam, in the Netherlands, is working in the direction of an actual implementation of circularity principles in its policies, with the implementation of the “Amsterdam Circular Strategy 2020-2025”; in this policy, the Municipality of Amsterdam recognizes the importance to prevent waste and to develop within the planetary boundaries (Gemeente Amsterdam, 2020).

This way, the definition of waste as a resource – as promoted by CE principles (Ellen MacArthur Foundation, 2015, 2017; European Commission, 2018) – can be improved and wider by embracing the need for regeneration depleted territories.

In the EU “Eco-Innovation Action Plan” of 2011 (EC, 2011), there is the aim to trigger eco-innovation while reducing environmental depletion. According to the EC definition, “Eco-Innovation is any form of innovation resulting in or aiming at significant and demonstrable progress towards the goal of sustainable development, through reducing impacts on the environment, enhancing resilience to environmental pressures, or achieving a more efficient and responsible use of natural resources” (from Decision N° 1639/2006/EC establishing a Competitiveness and Innovation Framework Programme).



Both the approaches of UM and CE are based on the use of circularity to move towards sustainability, hinting that circular solutions are not always sustainable. As an example, UM and CE have been recently coupled in an integrated approach indicated as the “New Urban Framework”, helpful in interpreting and planning the contemporary cities complexity (Lucertini & Musco, 2020).

Closing resource loops of production cycles is not enough; in fact, implementing circular metabolic resource management in urban areas involves restoring a balance between citizens well-being, urban structure, and the natural environment from which it draws (often non-renewable) resources, materials and energy. Recovering metabolic wasted resources and territorial waste asks for a systemic approach that implies employing the different skills belonging to different disciplines. The Netzstadt method presented in the previous Section is a valuable result in this perspective. However, the application of the CE principles to the territory to achieve a circular city requires the combination of strategies foreseen within the UM and Landscape approaches, e.g. human ecology of social sciences, industrial ecology with the study of the Material Flow Analysis, urban political ecology, as well as the Landscape Ecology (Grulois et al., 2018).

Since 2015, the 17 global macro-objectives for Sustainable Development Goals (SDGs) are the global tools to guide a new balance between ecosystem health, human well-being and economic growth (UN, 2015). They aim: promoting peace and prosperity, eliminate poverty and hunger, ensure health and well-being, quality education, gender equality, drinking water and hygiene, clean energy for all, decent work and economic growth, promote industry innovation and new infrastructure, reduce inequalities, promote sustainable cities and communities, guarantee sustainable consumption and production, take urgent measures to combat climate change, preserve and sustainably use the Oceans, protect and restore terrestrial ecosystems, promote peaceful and inclusive societies, strengthen collaboration for sustainable development. The debate on the SDGs' effectiveness without a radical change in the dominant economic models is open. Some schools of thoughts find a contradiction in Green Growth and decoupling theory ().

The dominant global economic models are based on a linear production, use, and disposal of goods. In 2020, the world recycling rate was only 7%. The linear extraction model leads on the one hand to the depletion of natural resources through extractive activities, with consequent environmental and social impacts, and on the other to the generation of large waste areas for waste management, with vast portions of territory destined for landfills or waste management and treatment plants.

They need to be overcome in the next future. The main objectives of the circular economy are derived from the idea of sustainability and sustainable development. However, some ecological economics schools of thought argue on contradictions between economic development and environmental protection.

Environmental protection increasingly corresponds to a new way of making cities from the urban ecology perspective. On an urban scale, CE is the basis of new circular city models.

The **circular economy** is mainly related to improving resource management through strategies that reduce consumption, reuse of goods, and recycling materials. Material waste can turn into secondary raw materials in this paradigm if adequately put in a circular supply chain. Waste production occurs at

every point in the production chains, from the extraction of virgin materials in nature to the treatment of waste itself at the end of its life cycle.
The relationship between the physiology of the supply chain of urban economic activities and the morphology of urban areas is an open field to be recognised. Urban planning, in this sense, has a profound influence on waste management.
Research on the circular economy for reducing, reusing, and recycling waste is considered together with other forms of economy, which in recent decades have proposed alternative scenarios to the dominant capitalist model of consumer society. The circular economy applied to the current capitalist system leads to paradoxes that will be explored in the discussion. Hence, the circular economy hypothesis can produce real improvements for global sustainability, if combined with other economic approaches.
The management of metabolic resources concerns flows and stocks that significantly impact a regional scale. However, local solutions and reusing waste areas take on a strong social value on a local scale.

In the comparison of the several CE definitions, we can find many common categories that Geisendorf & Pietrulla, (2018) group in six:

1. Motivation(s): Several concepts focus on the environment, profitability, or social aspects.
2. Proposition for waste management: A central aspect of the circular is reintroducing waste into the production loop by making it an input resource.
3. Guidelines and tools: Some concepts advise business models, operations, measurability or highlight the importance of governance.
4. Economic sectors covered: All concepts focus on industrial manufacturing and assembly activities of the secondary sector, and some also on agriculture, mining, or raw material suppliers from the primary sector to the tertiary sector.
5. Economic scope: Besides the micro perspective on the product or company level, some concepts additionally take a meso-economic perspective, considering industries or industrial agglomerations.
6. Activities during life cycle stages: By identifying and grouping all relevant activities during a product's life cycle while also including its development and the core.

In contrast to the 'take-make-waste linear model, a CE aims to decouple growth from resource consumption. CE proposes a restorative and regenerative economy by design, considering three principles: Design out waste and pollution; keep products and materials in use; and regenerate natural systems.
The main goal of CE seems to be closing the supply chains of the production processes in the loop. Indeed, in the CE paradigm, waste can be considered a new resource for the built environment. Although the dominance of waste management issues, CE is not only about waste reuse or recycle.
The RESOLVE framework (EMF, 2015) stands for:

1. Regeneration (shift to renewables resource, restore ecosystems),
2. Sharing (share assets, prolong life cycle through maintenance and design for durability),
3. Optimising (increase performance/efficiency of the product, remove waste in production and supply chain),
4. Loop (remanufactured products or components),
5. Virtualise (dematerialise goods),
6. Exchange (apply new technologies and choose services instead of a product).

Closing the circles of the production systems through local synergies of industrial ecology processes can lead to reduce raw material extraction, transports and landfills.

Material storage areas with new production areas for all hinges to close circular processes.
The doughnut economy model makes a synthesis of the models mentioned above (Raworth, 2017).

In *Prosperity without growth* (Jackson, 2009) the prosperity – in any meaningful sense of the word – transcends material concerns",[3] the book summarizes the evidence showing that, beyond a certain point, growth does not increase human well-being. Prosperity without Growth analyses the complex relationships between economic growth, environmental crises and social recession. It proposes a route to a sustainable economy, and argues for a redefinition of "prosperity" in light of the evidence on what really contributes to people's well-being.[1]
A systemic approach to human development (Cruz, Stahel & Max-Neef, 2009) that consider human well-being is one of the crucial points of SDGs and European Green Deal. Anyway, Circular Economy model has not been oriented to social issues from the beginning. Social and institutional aspects lack in the CE paradigm, but they are essential to achieve a important level of recycling, in particular for dissipative uses of materials (Moreau, Sahakian, Van Griethuysen, & Vuille, 2017). It is relevant to put the labor at the core of economy, both for its renewable nature and for the importance for human well being.
The umbrella of Circular economy can also find *social circular economy* () and the *doughnut economy* model (Raworth, 2017). A very recent study points out a selection of significant social indicators in the circular economy from the SDGs points (Padilla-Rivera, do Carmo, Arcese, & Merveille, 2021), concerning eradication of poverty and hunger.

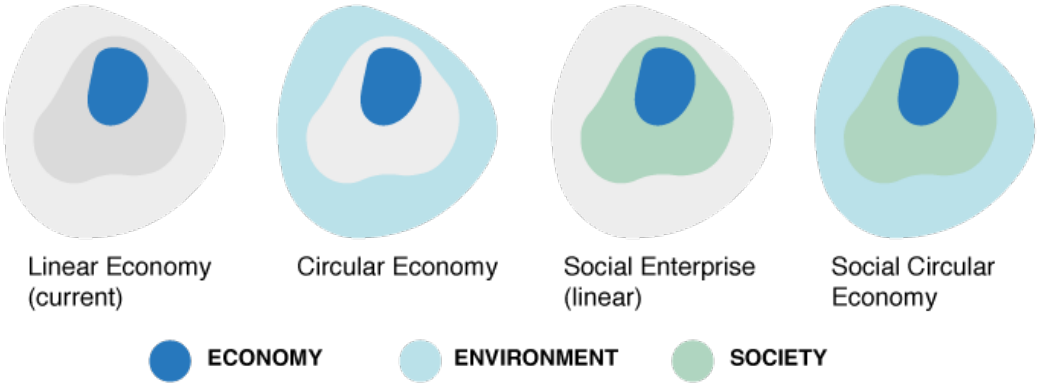


Figure 17. The three sustainability dimensions in the social circular economy.

Morton connects philosophically the idea of scarcity to hyperobjects and Object Oriented Ontology (2012), that is an interesting field for researches on urban metabolism and production processes.
However, a dilemma of the circular economy lies precisely in the paradox of growth. An autopoietic and circular system should be zero-balanced. So if all the waste and rejects come back as new inputs. If, at the same time, the system continues to absorb inputs from extractive activities, the entropy and size of the system continue to grow in an unlimited way. Unlimited growth does not exist in nature and is not sustainable. The theory of decoupling economic growth from resource use is a matter of debate. Hobson and Lynch (2016) argue that the ontological and sociological assumptions of the CE must be open to more radical critique. Their analysis on and reconsideration if this agenda is to deliver the profound transformations that its advocates claim are within our collective reach.
In the field of environmental sustainability, opposite visions converge in the growth **debate** (Drews et al., 2019). Castán-Broto and Westman present a strong case for re-appropriating the sustainability discourse as a means to advance social and environmental justice in contemporary cities (Gruibrunet, 2020).
The Circular Economy is contested by Alier, who states that "the economy is not circular, it is increasingly entropic" (2020), according to the second law of termodinamics in economics theorized by Georgescu-Roegen, so full circularity is an utopia. Alier (2015) already argued that sustainable development is a contradiction, because the decoupli. In this perspective, degrowth and redistrubuition of wealth would be a real strategy for the achievement of the SDGs.

On circular bio-economy and decoupling ,Giampietro (2015) expressed arguments to demonstrate that for the.. the decoupling of environmental depletion from economic growth is not possible.
The concept of degrowth (Latouche, 2010; Alier etc) is consisten with the doubt if “Is green growth possible?” (Hickel & Kallis, 2019). The contradiction of SGDs growth versus ecology on a finite planet (Hickel, 2019). Cowboy’s economy (D’Alisa, 2019) – the current economy is much more efficient than one century ago. However, it uses a considerable quantity of natural resources, producing environmental depletion without solving social inequalities in urban and non-urban areas.
Social circular economy closing loops stories (Hobson, 2020).
The circular economy is not the same of ecological economics. Part of the scepticism towards the circular economy is that the laws of thermodynamics limit the number of materials that can be recycled. In this way, some people think that the laws of nature still set limits and that the circular economy is not a recipe for infinite green growth. (Urhammer, 2017). With respects to these contradictions, the *doughnut economy* model (Raworth, 20) has found a synthesis, by setting thresholds to growth and degrowth. [...]
The importance of social and institutional dimensions in circular economy is highlighted by Moreau et al. (2017) considering the labor at the core of the economy given its renewable nature; social and solidarity economy are examples for the CE.
In this perspective, designing and evaluating this kind of strategies and models requires to *thinking through complex values,* that means to consider a multi-dimensional viewpoint and taking into account tangible and intangible, hard and soft, objective and subjective, use, non-use and intrinsic values (Cerreta, 1997; Fusco Girard & Nijkamp, 1997; Cerreta, 2010; Cerreta, 2016).
Circular economy has been globally accepted because it does not put in discussion the current capitalistic model and seems to be able to support the sustainability transition, but a deep shift in distribution of wealth and decision-making power seems inevitable..

3.1.2 Circular cities

(Social) space is a (social) product (Lefevbre & Ricci, 1978), thus many social changes happen in space. Because urban areas are the core of most economic processes and the place of much changes, the concept of circular economy and the debate around it has been transferred to urban environment. In recent literature, the spatialisation of circularity led to the formulation of the concept of the circular city: What is a *circular city,* and how it could work is an open research strand. Recently, many scholars (Williams, 2019) showed an aspect of CE overlooked for too long, meaning the importance of exploring the spatial dimension of circularity and the need to focus on land, besides that on materials.
Currently, this idea is directly associated with the circular economy paradigm. Since the city is a complex system, circularity in this case no longer concerns only consumer goods and metabolic resources but all its material and immaterial systems, which interplay in synergy. Many European cities are becoming circular by including those principles in their political agenda: Stockholm, London, Amsterdam, Paris (Williams, 2021).
Amsterdam is going beyond the CC model, adopting the Doughnut Economics model (Raworth, 2017), that adds some significant points to Circle City.
A bibliographic review on the topic was updated with a bibliographic search in Scopus in March 2021. The string "circular city" returns 164 indexed articles produced between 1970 and 2021.
In VOSviewer (Figure 18) we can see two thematic clusters divided between the literature on the circular city up to 2005 and in the last 15 years.
In the literature of the last 15 years, the circular city is associated to researches on implementation of solutions related to the sustainable transition and the circular economy, where the key issues are environment and resource management, including buildings as resource stock.

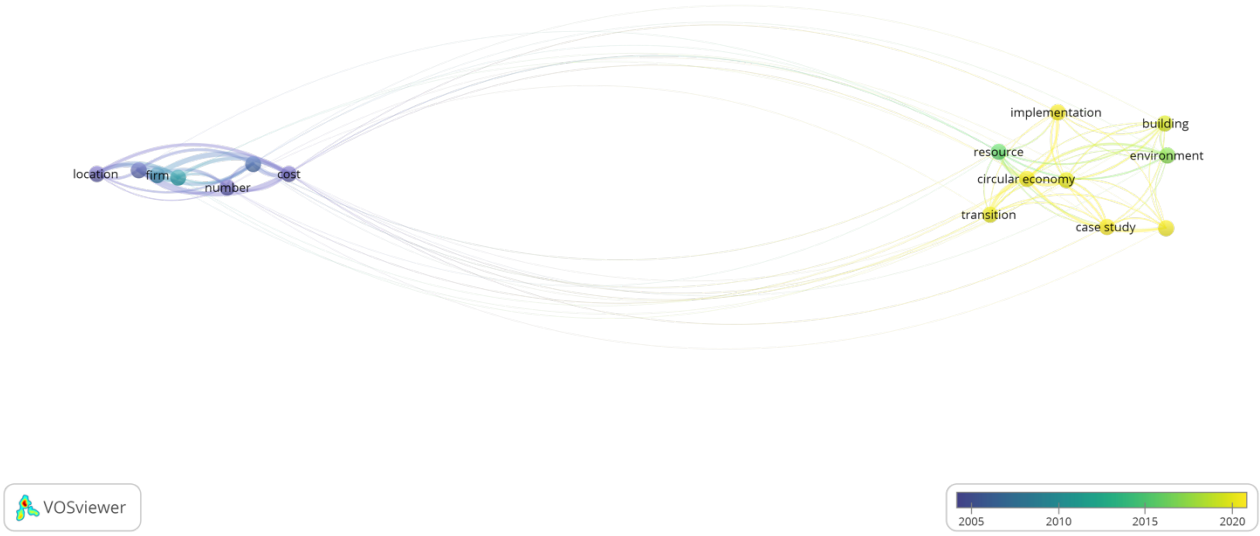


Figure 18. Circular city: The scientific literature landscape. VOSviewer elaboration.

However, clear and agreed definitions of a circular city are new in the literature, and many scholars are addressing the issue in recent years.

Interpreting circularity (Marin & De Meulder (2018a) analyse how urban landscape design can act as a pivot in transdisciplinary spatial circularity design research. Following Vandenbroeck's framework for urban metabolism spatial practices, from Designing with flows. According to Vandenbroeck, the first difference in urban metabolism spatial practices is in the worldview: objectivist versus constructivist.

The Circular City transition study starting from six European case studies (Prendeville, Cherim & Bocken, 2018) considered Amsterdam, Rotterdam, Den Haague, Glasgow, Haarlemmermeer and Barcelona. The Netherlands is at the forefront in the circular economy transition commitment in urban areas. The implementation of ReSOLVE framework in the six cases is checked through: knowledge development, collaboration platforms, business support schemes, procurement & infrastructures, regulatory framework and bottom-up initiatives.

A research group of architects from the model proposes implementing punctual actions in innovation hubs and transversal actions in the Regenerative Corridors. This spatial category is proposed as a spatial driver to overcome rural, peri-urban and urban (Boeri et al., 2019).

Circularity is primarily identified to create looped supply chains that avoid waste production and the waste of resources. A circular city, in this sense, is an autopoietic, self-regenerative and adaptive city.

Williams addressed the concept of a circular city (Williams, 2019) and analysed primary European cities case studies (Williams, 2021). Conceptualising circular cities, she identified the shift from an economic system to an urban system spatially defined. The production system of the RESOLVE framework ignores the spatial dimension, where land use and infrastructures play a fundamental role. Williams points out three fundamental actions for circular cities:

1. Looping actions
2. Regenerative actions
3. Adaptive actions

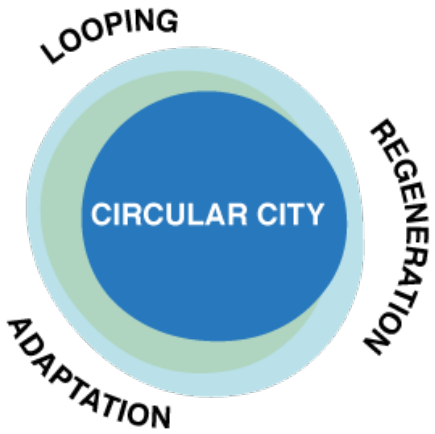


Figure 19. Circular city capacities.

Looping, regenerative and adaptive actions can be considered, hence, also the goals of wastescape regeneration. The idea of city like a living systems makes assimilating the urban processes with the processes studied by the natural sciences. The macro-category of urban physiology of the Netzstadt method can describe these dynamics. We can understand what a living system is, what all living things have in common and what organisational principles govern them. In this viewpoint, **looping, regenerative and adaptive** actions could be operating on wastescape regeneration like stem cells do on the pathologies of a sick organism. The relationships and interactions within systems are what determine their identity.

According to Chilean biologists Maturana and Varela (1992), the *organisation* is familiar to all living systems, regardless of the nature of their components. The regenerative and self-regenerative capacity of living systems stays in their heteropoietic and autopoietic capacity. All living systems function like machines, and their internal organisation defines their vital functions. Therefore living organisms are studied in terms of relationships and not in terms of the properties of their components. According to this theory of life, Autopoiesis is a necessary and sufficient condition for identifying a living being. Therefore, the fact that living systems are machines is not demonstrated by their components but by their organisation. Autopoiesis is the process that defines the characteristic common to all living beings: having the ability to self-regenerate.

Man-made machines (*heteropoietic*) have a purpose that is fulfilled by producing something other than themselves. Autopoietic machines, i.e. living systems, have an individuality that maintains a constant organisation by actively preserving an identity that does not depend on external interactions.

The circular city seems to reason on urban phenomena with the same approach, that is, reading the city as a living machine, observing its processes as it happens in natural ones, it is a point of view to understand in an integrated and multi-scalar way the mechanisms of functioning in which the economic, social and environmental aspects coexist. When the machine does not regenerate itself, it is doomed to extinction.

A circular process creates a self-sustainable, hence autopoietic, system. Purely sustainable systems are heteropoietic because their sustainability does not derive from their internal organisation but from outside, which impoverishes their environment. Zeleny (1997) argues that systems can only become self-sustainable internally and from below through the involvement and empowerment of their most active components, people, and knowledge. He stresses that knowledge is the most crucial form of capital in the production processes—knowledge is the ability to manage processes and thus to organise and self-manage systems. The poietic production processes, bonding and degradation (Fig.19) are in a circular closed loop in autopoietic systems.

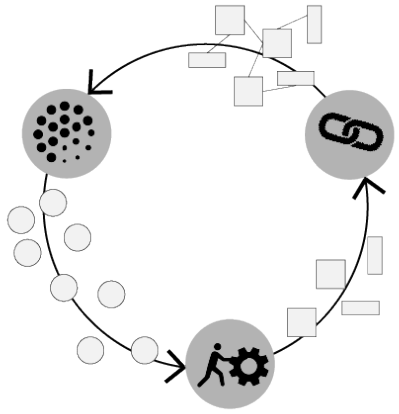


Figure 20. Circular organization of interdependent processes. Adapted from Zeleny, 1975.

In urban autopoietic processes, the circle would break without knowledge capital that connects and self-regulates this organism.

On this, Fusco Girard & Vecco argue that *the autopoietic capacities of an eco-bio system highlight its ecological value, that is, its intrinsic value or its non-use/independence from any use. Heteropoietic capacities are linked to many possible use-values and, first of all, to economic-generated values* (2021).

Therefore, urban activities, land use planning and adaptive reuse of circular cities need to be implemented circularly through the bond of knowledge.

The main activities to enhance Circular Economy are identified and monitored in the Circular Jobs report (Circle Economy, 2018). The study suggests seven critical elements of the CE and analyses the current *circular employment* per key element in Amsterdam.

Starting from the classification and the example circular job proposed, the main economic activities have been pointed out to understand which architectural space is mainly needed for *circular jobs* (Table 4).

Table 4. Circular Jobs mapped according to the DISRUPT Framework (source: Circle Economy)

CIRCULAR JOB	ECONOMIC SECTOR	CIRCULAR ECONOMY ELEMENT	EXAMPLE SECTORS AND ACTIVITIES	Corresponding NACE Rev 2.1 Codes
DIRECT CIRCULAR JOBS	**CORE SECTORS**	**Sustain and Preserve What's Already There**	Repair Services	33100; 33110; 33111; 33112; 33120; 33121; 33130; 33131; 33140; 33141; 33150; 33151; 33160; 33161; 33170; 33171; 33190; 33191; 45112; 45192; 45201; 45202; 45204; 45205; 45206; 45402; 47790; 47791; 47792; 47793; 95000; 95100; 95110; 95111; 95120; 95121; 95200; 95210; 95211; 95220; 95221; 95230; 95231; 95240; 95241; 95250; 95251; 95290; 95291; 95292; 95299

		Use Waste as a Resource	Recycling	36000; 36001; 36002; 36003; 37000; 37001; 37002; 37003; 38000; 38100; 38110; 38111; 38112; 38120; 38121; 38200; 38210; 38211; 38212; 38213; 38219; 38220; 38221; 38222; 38300; 38310; 38311; 38312; 38320; 38321; 38322; 38323; 38329; 39002; 43110; 43111; 46770; 46771; 46772; 46779
		Prioritise Regenerative Resources	Renewable Energy	3511
ENABLING SECTOR	Design for the Future	Industrial Design and Architecture		71110; 71111; 71112; 71120; 71121; 71129; 74100; 74100; 74101; 74102; 74103; 74104; 74105; 74109
	Incorporate Digital Technology	Digital Technology		61000; 61100; 61101; 61200; 61201; 61202; 61300; 61301; 61900; 61901; 62000; 62010; 62011; 62020; 62021; 62030; 62031; 62090; 62091; 63100; 63110; 63111; 63120; 63121; 63900
	Rethink the Business Model	Renting or Leasing Activities		43996; 77200; 77210; 77211; 77212; 77213; 77220; 77221; 77290; 77291; 77292; 77293; 77294; 77295; 77296; 77299; 77300; 77310; 77311; 77320; 77321; 77330; 77331; 77340; 77341; 77350; 77351; 77390; 77391; 77392; 77393; 77394; 77399; 96010; 96011; 96012; 96013; 96014; 96015
	Team up to Create Joint Value	Professional and Networking Associations		94100; 94110; 94111; 94120; 94121; 94200; 94201
INDIRECT CIRCULAR JOBS	**INDIRECT CIRCULAR SECTORS**		Education	
			Government Services	
			Professional Services	

Considering the categories of activities and the *circular jobs*, the built environment adaptation is in the core sector both in the functional and physical adaptation for circular activities.

We consider the system composed of waste flows, outputs of the urban metabolism of matter, and wastescapes, the waste areas of urbanised areas, as new inputs to close the circle of urban metabolic processes. The facilitation of circular economy in urban planning has a potential in Living Labs experiences (Remøy et al, 2019).

In “The Right to the City”(1968), Lefebvre find in the shift from use value to exchange value the reversal of the city's sense, which from being a place of human interaction has become predominantly a place of trade, now with capitalism. Use value contains the meaning of the life of a place. The functions and the services of a urban landscape make the difference for people well-being. The exchange value is in the profit linked to a regeneration operation. The exchange value should be controlled, and it should be instrumentals to the use-value. The exchange values that a regeneration operation produces can make an urban or real estate operation autopoietic (self-sustainable) to guarantee life over time.

Besides the monetary values, given by use and non-use-value, other non-monetary values determinate the well-being in urban environments:

- the intrinsic value is given by the cultural heritage (Fusco Girard & Vecco, 2021);
- the glue value, given by relationships and links between people (Fusco Girard, 2020).

From the existing literature, we can therefore state that the circular city is:

1. a city in which the economy is entirely (or mostly) circular, metabolic-wise;
2. a city in which there are no wastescapes or wasted areas, in which each area is in synergistic and complementary relationships with the others;
3. an autopoietic city, i.e. self-sufficient and self-regenerative.

Open issues on the transition towards circularity are mainly about the lack of a clear and unique definition of CE, and of what are the indicators of a circular city, because current literature and urban experiences are different and in an experimental stage. Field experiences are more valuable than theoretical frameworks to keep exploring and implementing strategies. The regulatory level is lacking clear norms about how to implement circularity principles. In fact, public policies are not specific yet about that, and more clear indications on it would help stakeholders and architects in their daily practice. The use of data for monitoring indicators depends on national, regional and local availability.

3.2 Evaluation criteria for wastescapes regeneration

Wastescape has been defined, in Chapter 2, as a cultural landscape of waste composed of physiological and morphological systems. These systems have place in small or large territorial contexts and embrace the production and waste of space (Neumann, 1992; Lefevbre, 1978 ; Lynch,1990b), and the metabolic production systems. The progressive exclusion and abandonment of part of the landscapes and built environment are identified as effects of dysfunctions and imbalances of city expansion and metabolic processes. They produce disfunctions, disservices and disametinities that affect the landscape and the human well-being.

Urban regeneration can improve human well-being putting human-nature relations at the centre of this process. The relationship with nature does not only stay in giving space to nature in urban areas. The bond with nature places in all the strategies and actions aimed at improving the ecosystem and landscape services.

Urban issues are complex, and their decision-making processes are multidimensional, multi-scalar, and multi-actor. That's why today, a global consciousness is indispensable for the sustainability any local choice.

In this sense, the criteria for evaluating a wastescape depend on the local cultural and on the objectives a place wants to achieve. Therefore, the construction of assessment criteria and the selection of indicators for monitoring impacts and changes over time needs to be consistent both according to the sustainability transition, with the economic models promoted by the European Union, and to the local needs.

The criteria stand on the balance of the three sustainability pillars: environment, society, and economy. Circular economy and circular city models are trying to address these multidimensional sustainability transition challenges. The objective of this study is exploring wastescape regeneration.

We can evaluate a cultural landscape considering the social well-being, i.e. the Fundamental Human Needs (Max-Neef, 1991) and the Urban Ecosystem Services (de Groot, 2006).

Landscape services (Vallés-Planells, Galiana & Van Eetvelde, 2014) in urban areas, we must start from the artificial and natural functions and services of the Ecosystem Services. In fact, landscape services are the results of While urban landscape provide goods and services, the urban wastescapes provide waste and disservices. Thus, a wastescape regeneration can be evaluated with the criteria of a multifunctional urban landscape. Socio-cultural indicators are the basis of human well-being, the Fundamental Human Needs (FHN) (Max-Neef, 1992) satisfaction is the aim of any neighbourhood performance.

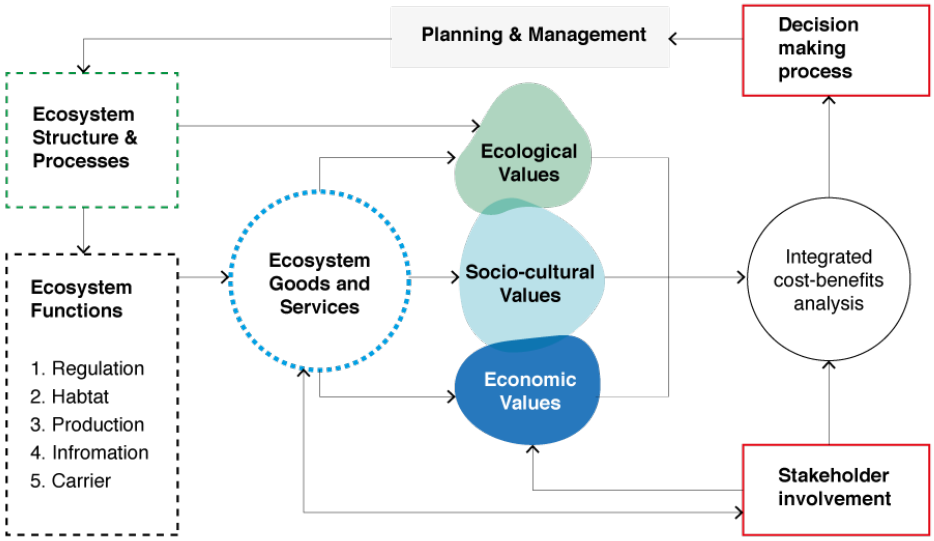


Figure 21. Role of function analysis and valuation in environmental planning, management and decision-making (adapted from de Groot, 2006).

The Urban Landscape Services (ULS)

Urban planning and management policies are responsible for the ULS equitable distribution. The absence or lack of some goods and urban functions provide *disfunctions and disservices* for people and the ecosystem. In this Chapter 3.2, the literature on FHN and Landscape Services, the Urban Ecosystem Services will be explored to identify those criteria able to support a wastescape evaluation.

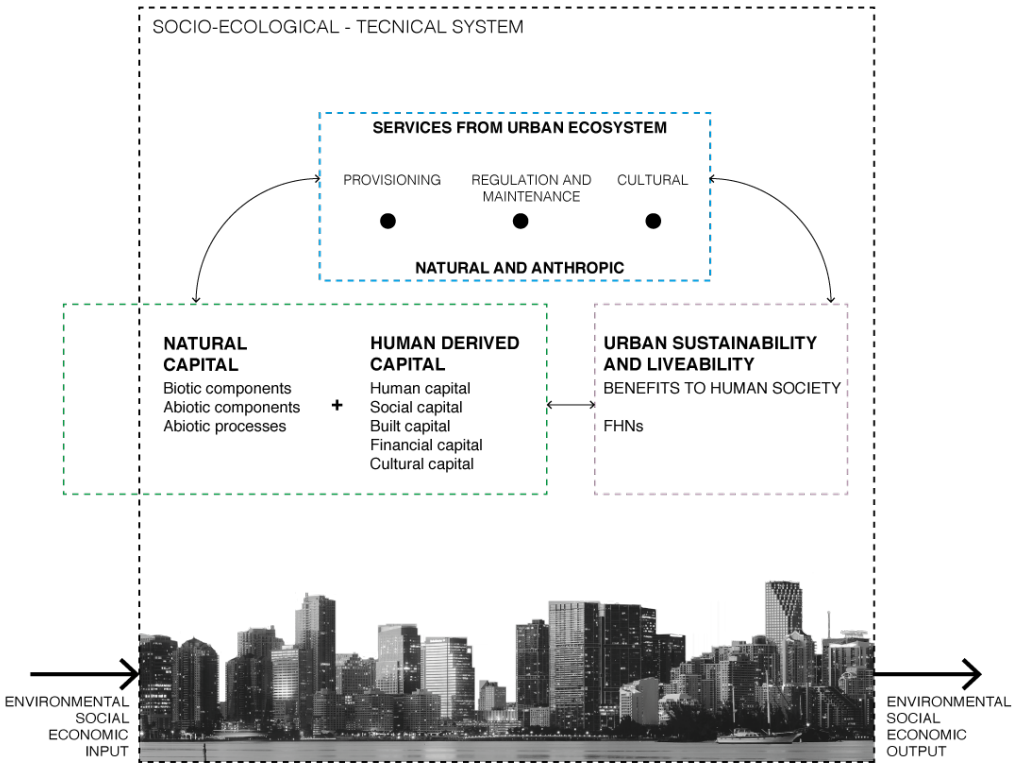
The concept of disservices in the ES literature is subject to debates on different meanings and scientific perspectives. Analogously, the urban ecosystem services can be interpreted in two main ways. These parameters can be benchmarks in the evaluation processes of strategies that aim at regeneration for the circular city.

The integration of ecosystem services and values in landscape planning, management and decision making (de Groot, Alkemade, Braat, Hein, & Willemen, 2010)

In Paragraph 3.2.1 the human needs and ecosystem functions are introduced.

3.2.1 Urban Landscape Services

Ecosystem Services literature has an anthropocentric perspective. What are the functions of ecosystems, and what are the services for human well-being. A debated interpretation of the concept of functions and services meaning is open. The first definition of the Ecosystem Services (ES) appeared in 1981 (Ehrlich & Ehrlich, 1981) and more nearly with Ehrlich and Mooney in 1983 (Costanza et al, 2014). ES is defined as the ecological characteristics, functions or processes that directly or indirectly contribute to human well-being (Costanza et al., 1997; Millennium Ecosystem Assessment, 2005). New cultural thought itineraries shape paths that weave a dialectical synthesis between science, technology, religion, ethics, and aesthetics from the beginning of the new millennium. The fundamental importance affirmed and developed in the Millennium Ecosystem Assessment (MEA) put a link between the Ecosystem Services (ES) and social well-being.



Ecosystem health and human well-being must be evaluated together in urban areas. The basic concept is that, in general, our well-being depends on the services provided by nature. According to the MEA, biodiversity in urban areas mainly performs air, water and climate regulation services, becomes cultural heritage and supports cultural services. In peri-urban transition areas close to urban centres, cultivated areas provide provisioning, regulation and cultural services. These services that nature offers when it is respected and cared for by human beings contribute to well-being by producing environmental, economic, and socio-cultural values. For instance, nature-based activities can be related to management and production in the agri-food chain and the tourist and leisure activities for the city's inhabitants. More generally, UES respond to many different human needs.

The concept of needs was developed in the field of psychology by Maslow to explain individual motivation process (Maslow, 1943). His ‘hierarchy of human needs’ consisted of five needs, ranked in a pyramid. It was very criticized for the limitations of hierarchic dependencies. In response to the limitations of a Maslow’s hierarchy, Chilean ecological economist Manfred Max-Neef created his model of ‘human scale development’ (Max-Neef, Elizalde, & Hopenhayn, 2006). For Max-Neef, *the fundamental human needs are finite, few and classifiable and are the same in all cultures and in all historical periods. What changes, both over time and through cultures, is the way or the means by which the needs are satisfied*. Max-Neef outlined a taxonomy of **Fundamental Human Needs** developing a matrix of needs and satisfiers (Table 5) (Max Neef, 1992).

Table 5. Fundamental Human Needs matrix of needs and satisfiers (Max-Neef, 1992).

FHN	**Being** (attributes)	**Having** (institutions, norms, tools, mechanisms, laws)	**Doing** (actions)	**Interacting (*Estar*)** (locations and milieus)
Subsistence	1/ Physical health, mental health, equilibrium, sense of humour, adaptability	2/ Food, shelter, work	3/ Feed, procreate, rest, work	4/ Living environment, social setting
Protection	5/ Care, adaptability, autonomy, equilibrium, solidarity	6/ Insurance systems, savings, social security, health systems, rights, family, work	7/ Co-operate, prevent, plan, take care of, cure, help	8/ Living space, social environment, dwelling
Affection	9/ Self-esteem, solidarity, respect, tolerance, generosity, receptiveness, passion, determination, sensuality, sense of humour	10/ Friendships, family, partnership, relationships with nature	11/ Make love, caress, express emotions, share, take care of, cultivate, appreciate	12/ Privacy, intimacy, home, space of togetherness
Understanding	13/ Critical conscience, receptiveness, curiosity, astonishment, discipline, intuition, rationality	14/ Literature, teachers, method, educational policies, communication policies	15/ Investigate, study, experiment, educate, analyse, meditate	16/ Setting of formative interaction, schools, universities, academies, groups, communities, family
Participation	17/ Adaptability, receptiveness, solidarity, willingness, determination, dedication, respect, passion, sense of humour	18/ Rights, responsibilities, duties, privileges, work	19/ Become affiliated, co-operate, propose, share, dissent, obey, interact, agree on, express opinions	20/ Settings of participative interaction, parties, association, churches, communities, neighbourhoods, family
Leisure	21/ Curiosity, receptiveness, imagination, recklessness, sense of humour, tranquillity, sensuality	22/ Games, spectacles, clubs, parties, peace of mind	23/ Day-dream, brood, dream, recall old times, give way to fantasies, remember, relax, have fun, play	24/ Privacy, intimacy, spaces of closeness, free time, surroundings, landscapes
Creation	25/ Passion, determination, intuition, imagination, boldness, rationality, autonomy, inventiveness, curiosity	26/ Abilities, skills, method, work	27/ Work, invent, build, design, compose, interpret	28/ Productive and feedback settings, workshops, cultural groups, audiences, spaces for expression, temporal freedom
Identity	29/ Sense of belonging, consistency, differentiation, self-esteem, assertiveness	30/ Symbols, language, religions, habits, customs, reference groups, sexuality, values, norms, historical memory, work	31/ Commit oneself, integrate oneself, confront, decide on, get to know oneself, recognize oneself, actualize oneself, grow	32/ Social rhythms, everyday settings, settings which one belong to, maturation stages
Freedom	33/ Autonomy, self-esteem, determination, passion, assertiveness, open-mindedness, boldness, rebelliousness, tolerance	34/ Equal rights	35/ Dissent, choose, be different from, run risks, develop awareness, commit oneself, disobey	36/ Temporal/spatial plasticity

They express in being (*qualities*), having (*things*), doing (*actions*) and interacting (*setting*). Needs and satisfiers vary through time and cultures, but fundamentals are constant in the human-scale development approach.
An group analysis can let communities be aware of their deprivations and potentialities.
The satisfiers selection should be discussed critically by the group, to determine if they can be generated *exogenously* or *endogenously*, that is by the community itself. Such an analysis can reveal the potential capacity for local self-reliance (Max-Neef, 1991).
Cities can provide or subtract many of FHNs to their inhabitants.
In negative terms we could consider Urban Ecosystem *Disservices*. In literature Ecosystem Disservices refer to all inconveniences produced by nature in urban areas. In fact, according to some authors, beyond an idealised vision of the natural environment, the **Ecosystem Disservices** (EDS) produced from natural elements in urban areas must be considered in urban planning and design [28]. Von Döhren and Haase review of EDS literature with a focus on cities found that most of them are have been studied at a local scale [29]. Significant indicators of EDS are about bio-physical, then economic, and, last, cultural-social. Some of urban EDS identified are the allergenic potential of individual plants, extensively areas of non-illuminated parks, a disservice to urban people, but it is fundamental for some nocturnal species; emissions of volatile organic compounds, emissions from maintenance activities, concentrations of particulate matter in the air, an abundance of undesired species, maintenance cost for urban green areas, percentage of tree species susceptible to damage, percentage of trees yielding fruits, number of aged trees, amount of affected infrastructure, number and size of trees near buildings, amount of water used for plant growth, etc. Lyttymaki affirms that an essential issue of the concept of EDS is not about the disparaging nature in urban areas but about putting both ES and EDS under a common evaluation framework. Villa, however, argues that the use of the concept of EDS hinders, rather than helps, the development of an integrative and constructive dialogue on conservation and the complex interrelationships between human beings and nature. Equal consideration of services and disservices allows a holistic valuation that captures both positive and negative effects, ever-present and object of multiple evaluations.
The definition and the scope of EDS is an open debate. Shackleton et al., in a literature review about this definition, say that disservices are EDS only if the Ecosystem rather than human action generates them. For instance, the dropping of litter has been used as an example of an EDS by Lyytimaki and Sipila. Still, the same might be said about aesthetically unpleasing man-made design on the landscape. According to Shackleton et al. [34], human behaviours and values are not ecosystem functions and processes. Although we accept that humans are an integral component of ecosystems, humans themselves and their actions do not constitute ecosystems. In this open debate, the authors do not have a unique position considering ES and EDS of a wastescape.
In a landscape in crisis, UES and ES provide support to repair environmental dysfunctions and activate services functions that a site, neighbourhood, or city lacks.
Over time, the study on ES has been accused of anthropocentrism. However, man is a living being in nature like other species and, like other species, uses the resources available for his survival. ESs make explicit the dependency relationships between human beings and the natural environment, and in this way, they help protect, manage and design the natural environment [37].
Tan et al (2020) clarified ES in the literature by distinguishing between the **urban ecosystem services** in two groups, as:

- services of the urban ecosystem
- ecosystem services in urban areas.

A multifunctional landscape produces services or disservices for people.
From an environmental point of view, a cultural landscape's ecosystem or cultural services are cancelled out in the wastescape. By its nature, the wastescape produces ecosystem services or landscape (hence cultural) disservices. The literature on explicating wastescape performance through Urban Ecosystem Services and Urban Metabolism can support the wastescape analysis.

The term landscape services has been adopted in the field of international research to define the services usable by humans that result from their interaction with the landscape (Limburg, 2002). In contrast to ecosystem services, which are identified at the broader scale of natural ecosystems (MEA, 2005), the concept of landscape services makes explicit the interaction between a physical, natural and man-made system with all the use and use-independent values recognised by humans. Thus, while biophysical functions may continue to perpetuate in the absence of people, landscape services exist only insofar as there is a community that uses and values the landscape (Cerreta, 2014). The urban landscape is thus a multifunctional system, in which human services are both tangible and intangible.
The **Landscape Services** (Vallés-Planells, Galiana, & Van Eetvelde, 2014) (*Table 6*) make a synthesis of CICES services, the de Groot classification of landscape functions and values in de Groot (2006) and Antrop et al. (2013).

Table 6. The Landscape Services: themes, classes and groups (Vallés-Planells et al. 2014).

THEME	CLASS	CODE	GROUP
Provisioning	**Nutrition**	**P1**	Terrestrial plant and animal foodstuffs
		P2	Freshwater plant and animal foodstuffs
		P3	Marine plant and animal foodstuffs
		P4	Potable water
	Material	**P5**	Biotic materials
		P6	Abiotic materials
	Energy	**P7**	Renewable biofuels
		P8	Renewable abiotic energy sources
	Daily Activities	**P9**	Place to live
		P10	Place to work
		P11	Place to move
Regulation and Maintenance	**Regulation of wastes**	**RM 1**	Bioremediation
		RM 2	Dilution and sequestration
	Flow regulation	**RM 3**	Air flow regulation
		RM 4	Water flow regulation
		RM 5	Mass flow regulation
	Regulation of physical environment	**RM 6**	Atmospheric regulation
		RM 7	Water quality regulation
	Regulation of biotic environment	**RM 8**	Pedogenesis and soil quality regulation
		RM 9	Lifecycle maintenance and habitat protection
		RM 10	Pest and disease control
		RM 11	Gene pool protection
		RM 12	
	Regulation of the Spatial Structure	**RM 13**	Connection of spaces
		RM 14	Buffer disturbing use
		RM 15	Provision of spatial complexity

Cultural and Social	**Health**	**CS 1**	Physical health
		CS 2	Mental health
	Enjoyment	**CS 3**	Passive enjoyment
		CS 4	Active enjoyment
	Personal Fulfilment	**CS 5**	Way-finding
		CS 6	Scientific resource
		CS 7	Didactic resource
		CS 8	Spiritual experience

Economic activities plays a core role interplaying with the built environment and producing urban ecosystem services (Figure 22).

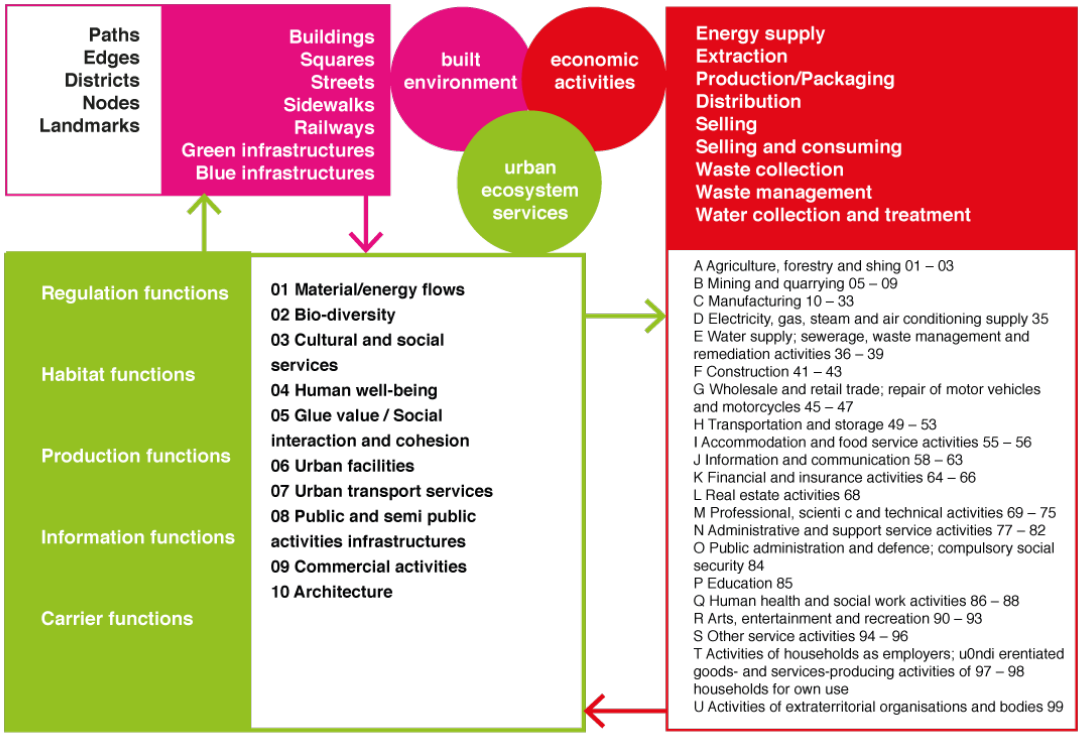


Figure 22. Economic activities, Built Environment and UES.

Given the nature of wastescapes, the assessment frame must consider both urban landscape and urban metabolism indicators. Circularity is monitored through the material flow balance, in terms of UM input and output. Consequently, a wastescape evaluation can be proposed through the lens in the circular city transition. Urban context is a urban ecosystem, that in the anthropocentric perspective is a urban (cultural) landscape able or not to satisfy the fundamental human needs.

Recent researches of the scientific literature show that UES and UM are compatible for integrated assessments, but the field is still to be explored. Furthermore, cultural services are not considered in relation to UM (Elliot et al., 2019).

Landscape services can support the assessment of a complex urban system where the assessment is made from an anthropocentric point of view, i.e. by putting FHNs at the centre and considering the services that the physiological and morphological systems of the urban environment offer to humans. Tangible and intangible values are constituted by the services that the functions offered by the urban landscape assets provide. The wastescape was interpreted in the previous chapter as a man-made waste system and as a cultural landscape, consisting of material and immaterial wastes and discarded and rejected parts of space.

This gap is due to urban metabolism has been studied concerning environmental impacts on urban areas in the ecosystem in which they are embedded.

It becomes interesting to consider the cultural and creative dimension about the possibilities of managing metabolic flows in urban areas through actions at the small neighbourhood scale. If, for example, the management of a region's waste in a large and innovative biogas plant can have a tremendous environmental and economic impact, it will probably not have much cultural impact. On the other hand, the new ecological awareness and love for the city or the environment are manifested in bottom-up actions, i.e. community composting in small towns or creative reuse initiatives for various types of waste. These actions do not have a tremendous environmental or economic impact. However, they have a significant cultural impact on the perception of waste as an opportunity and the creation of community and collective life opportunities.

The self-management of metabolic inflows and outflows takes on a cultural value for one or more groups of citizens and stakeholders who form a community in an urban area that becomes a single organism (De Ceuvel in Amsterdam).

Table 7. The Morphological elements of the built environment.

Dimension	Category	Indicators
Built environment and urban facilities	**5. Bio-diversity components**	Green areas (public and private)
		Trees
		Complex cultivation patterns
		Blue areas
	6. Architecture	Diversity of architectures
		State of conservation of the buildings
		Landmarks
		Vitality at ground floor
		Visual street control
		Number of vacancies for flexible functions
		Public spaces (squares, public spaces)
	7. Collective facilities	Facilities for sports activities
		Leisure and recreation areas
		Walk paths
		Meeting points
		Children play areas
	8. Transport facilities	Public transport connection
		Metro or train stations
		Public parking areas
		Cycle paths
		Streets

	9. Public and semi public facilities	Schools
		Hospitals, health care
		Police, security services
		Associations, NGOs
		Places for cultural activities (Libraries, archives, museums and other cultural activities)
	10. Commercial facilities	Hotels and similar accommodations
		Restaurants
		Bar / take away food
		Shops, super/minimarkets, street markets (Retail sale of food, beverages)

Table 8. The Physiological elements of UM and society.

Dimension	Category	Indicator
Urban Metabolism	**1. UM outgoing flows and stock**	Separated Urban Waste produced
		CDW produced
		Residual Solid Waste (inh/year)
Society and culture	**2. Culture and social services**	Criminality
		Presence of religious sites (Churches, votive shrine, symbolic points)
		Art presence (Sculpture, street art, installation)
		Places to enjoy
	3. Human well-being	Physical/Aesthetic care
		Mental health
		Literacy
		Unemployment rate
		Average household income
		Youth employment rate
		Mortality
		Public order and safety activities
		Perceived danger
	4. Social interaction & cohesion – Glue value	Sense of community
		Solidarity between neighbours
		Care of common areas
		Love for the neighbourhood

3.3 Decision-making processes: Evaluation methods for collaborative approaches

The challenge of coexistence without homologation seems to be really hard (Sennett, 2012), but urban diversity is the future of cities economic growth (Quigley, 1998). In systemic logic, it is worth identifying and establishing links to create cooperative relationships between people and the built environment. Public policies, rather than functioning as an external regulatory mechanism cast from the other, are effective when they become the nexus between things.

Public administrations wishes to implement public policies need to compare different options to assess their social attractiveness (Dasgupta, 2001). To regenerate a wastescape, the systems of waste need to be identified per layer, and at specific analysis can correspond integrated evaluations and integrated strategies.

Following Netzstad's approach and according to the definition of wastescape, the systems identified in the production of urban waste are morphological and physiological, i.e. produced by material and immaterial agents. Urban complexity is made of different dimensions and include the management of the built environment with the social and metabolic dynamics, among others. Therefore, urban

complexity requires that urban regeneration starts from structuring decision-making problems appropriately.
In this Chapter 3.3, some methods are identified to cope with some categories of waste, at different scales. The aim is to highlight specific ways of clarifying the issues and alternatives to activate solutions for the transition to sustainable, circular and regenerative models. A social inclusive model of circular city needs collaborative decision-making. Collaboration is a challenging craft, but evaluation techniques can support processes and provide incremental feedback, returns, problem discovery, and conflict management.
If *a camel is a horse designed by an assembly* (Ratti, 2014), it will probably be slower but will go further. Complex problems where multiple actors are involved correspond to several opposite possibilities and alternative. Complex solutions can identify a much more careful response capacity, especially in territories, areas, and buildings in crisis.
A collaborative approach is an asset to cope with environmental conflicts resolution (Walker & Daniels, 2019). Social Multiple Criteria Evaluation (Munda, 2006). Social interaction and cohesion define the social capital of a place. The spatial-urban factors determine place-based happiness and the decision to stay. Both characteristic features (e.g. public services, accessible green) and emotional or relational expressions (e.g. sense of belonging, pride)
The directives dictated by public policies through plans and legislative instruments for governing the territory, structured in a pyramidal hierarchy typical of all institutions, meet civil society and often clash with the urban dynamics that arise spontaneously from below. The evaluation techniques allow at overcome a top down approach to decision making. An active multi-actor approach in decision making is the core of circularity and future self-sustainable built environment.
How to manage a decision-making process to transition to an urban model aiming at the objectives outlined above? If public policies take liveability and improved performance of the human-nature ecosystem as criteria for development, how can the complexity of multidimensional and multi-scalar challenges be managed?
Cross-impact/network analysis/system thinking:
1. valutare ogni sistema di scarto
2. i risultati di ogni valutazione sono strumenti di un processo decisionale strutturato in modo da essere multi dimensionale e multi gruppo (urban ecology e circolarità).
In questa ricerca i wastescape urban comèosti da UM, gruppi sociali e architettura di scarto:
Material Flows Analysis, Wasted Architecture, Social innovation, MFA, LCA, etc.

Table 9. Methods for assessing wastescape systems at different scales.

Scale	**Regional**	**Municipal**	**District/ Neighbourhood**	**Lot**	**Building**
	XL	**L**	**M**	**S**	**XS**
Social well-being			**SMCE / MCDAs**		
Urban Metabolism	**AS-MFA**				
Built Environment			**Spatial analysis / Architecture analysis**		

A Multi-scale approach to wastescape means that at different scales of study will correspond different waste systems and different analyses.

Table 10. Scales, waste systems and methods.

Size	**Scale**	**Waste system**	**Evaluation Method**
XL	Regional	Waste flows and stock	MFA
L	Municipal	Waste flows and stock	MFA
M	District/neighbourhood	Waste flows and stock	MFA
S	Lot	Wasted architecture	Adaptive reuse

XS	Building	Wasted architecture	Adaptive reuse

The Material Flow Analysis is an evaluation method to study material flows into and out of a system. It is based on the study of material flows and the balance in and out of a system. Evaluations are at the core of interdisciplinary researches and applications of UM in urban studies. The Metabolic Impact Assessment for urban planning (Pinho, Oliveira, Cruz, & Barbosa, 2013) proposes a synthesis of evaluation methods and considers the land together with the metabolic resources in the SUME project (Davoudi & Sturzaker, 2017). Similarly, landscape design (Marin & De Meulder, 2018b; Oliveira & Vaz, 2020), wastescapes regeneration (Amenta & van Timmeren, 2018) and built environment as resources for improving UM set a nexus between UM, planning and design (Davoudi & Sturzaker, 2017; Liu, Chang, Chen, Zhou, & Feng, 2017). The use of UM models for design is cogitated (Roggema & Alshboul, 2014), also jointly with the regenerative design approach by Thomson & Newman (2018).
Several research projects explored resource management in urban contexts and have been case studies in the selected papers of the literature review, i.e. DIEMIGO 2.0 (van Timmeren et al., 2012); SWITCH - Sustainable Water management Improving (Agudelo-Vera, Leduc, Mels, & Rijnaarts, 2012); SREX - Synergy between Regional Planning and Exergy (Leduc & Van Kann, 2013); BRIDGE - sustainaBle uRban plannIng Decision support accountinG for urban mEtabolism (Chrysoulakis et al., 2013; Mitraka et al., 2014); REPAiR – Resource Management in peri urban areas (..., Remøy et al., 2019). These studies consider territory, landscape, wastescapes and the built environment as resources for an improved metabolism (Amenta & Qu, 2020; Amenta & van Timmeren, 2018; Arora et al., 2020; Ivanović, 2020; Marin & De Meulder, 2018b; Tanikawa & Hashimoto, 2009). The characteristics of interdisciplinary research and applications is demonstrated by the different DSSs and software developed ad hoc, but also through the combined use of classical UM and spatial analysis tools. GIS-based tools are fundamental in the management of mapping working with spatialised data, as well as for the monitoring of environmental data related to landscape projects. The issue of resource management is at the basis of UM integration in planning. In fact, resource-based design means both starting from the evaluation of a balance of metabolic resources available in a certain urban or territorial area, but also considering the building stock and soil as finite resources to be optimised in their ecosystem performance.

3.3.1 The Geodesign method and the multi-criteria and multi-actor approaches for the regeneration of the Built Environment

The importance of architecture reuse is not only environmental, but it is historical too. Architecture and built environment constitute urban landscapes. The love for the neighbourhood stay between the “body” and the “soul” of a neighbourhood (Hårsman Wahlström, Kourtit, & Nijkamp, 2020), i.e. between the urban landscape services offered by the urban morphology and the physiology.
These sets of activities for circularity can be considered in the functional programme of vacant buildings adaptive reuse. The adaptive reuse of the wasted building stock (Paragraph 2.2.2) can enable circular city approaches avoiding demolition waste and reusing resources. Adaptive reuse of the built environment is a strong driver for environmental sustainability (Foster, 2020) and circular cities.
To manage unfinished or abandoned buildings, it is essential to consider both the formal and informal uses surrounding the area and the physical part of building components.
The operational phases are oriented to define specific routes capable of offering answers on:

- definition of the operational programme, where the request for intervention is made explicit;
- construction and acquisition of constraints, where the reference national and local regulatory framework is reconstructed to identify the need for adaptation to it;

- identification of the specific technical legislation, where a framework is established for the requirements of the action;
- organization of the existing detection actions, where the construction of the knowledge framework is defined by establishing the control data and the appropriate prediagnostic operations;
- definition of the category of intervention and definition of the criteria for the preparation of the preliminary project;
- organization of actions for a technological survey and appropriate diagnostic operations;
- an economic evaluation of the intervention hypothesis, where the criteria and tools for evaluating choices and technologies are explained;
- assessment of the compatibility and sustainability of the choices, where the criteria and tools for evaluating the choices of materials are explained;
- definition of the executive project, through the elaboration of detailed plans of the technical specifications to be adopted;
- analysis of the construction feasibility, where the problems concerning the construction site and the management of the process are taken into consideration.

According to Thomsen and van der Flier (2006), an adaptive reuse strategy is only preferable to demolition if the objectives of environmental sustainability and reduced energy consumption can be achieved.
Considering that a building stock will increase (Marinova et al., 2020), the urban mining of wasted buildings (Koutamanis, Reijn, & van Bueren, 2018) is a huge resource (Zhang, Zhong, & Geng, 2019).
Magamagement successful conditions for the adaptive reuse are based on a "tripod" of principles according to Fusco Girard & Nocca (2019):

- Autopoietic, the self-organising capacity of cultural heritage, that is the ability to renew itself;
- Symbiotic, the relationship of mutual interdependence with the external context;
- Generative, the capacity of generating external effects.

These performances are possible only with a mix of functions that can vary case by case.
will self-sustain the building's economy and maintenance, close the circle by using locally sourced materials (which also avoids environmental impacts due to transport in and out of the reference system), consider the building's use functions in relation to the neighbourhood context, and finally produce chains of regenerative values, that is economic, social, cultural and environmental.
The adaptive reuse of the built environment involves local authorities, private investors, neighbourhood communities, which are often the only ones who know about the regeneration process.
The enabling conditions (B.A.) for knowledge transmission are requirements to manage in all contexts where knowledge transmission has to occur (Choo et al., 2008). Cognitive and decision-making processes importance as creators of enabling contexts for the sustainable and circular transition are one hypothesis of the present work. Increasingly popular approaches to collaborative planning are driven by pursuing the common good within the delicate natural ecosystem in which we find ourselves.

Suppose the wastescape need to be regenerated in the perspective of circular economy and the circular city. In that case, they need to be transformed through actions that integrate the participation and collaboration of different actors and stakeholders. For this purpose, decision-support systems are methods and tools that play an enabling role in enhancing organizational learning (Bhatt & Zaveri, 2002) and support creating contexts to manage the dialogue in decision-making. However, conflicts and disagreements are common, mainly when multiple stakeholders are involved in complex public choices. In the next Section, the waste management conflicts in Naples and the Land of Fires area will show a clear example of this issue. Also, the M/L Case Study presented in Part IV will show two cases where the modern top-down approach to planning did not work (Jacobs, 1981) and created large refused neighbourhoods and architectures that were rejected by the citizens, resulting in wastescapes. In that

cases, small groups of professionals and decision-makers, even guided by the best intention, planned wasted buildings and wasted urban areas.
According to Sennett, *cooperation is a craft* that has weakened over time, which historically was based on established social structures, where working together provided a bond between people (Sennett, 2012). Creating an environment of cooperation and collaboration requires time and some conditions. An enabling context is an environment suitable to make changes happen. Enabling conditions are the conditions to improve or build to generate an enabling context (Nonaka et al., 2000; Choo & Alvarenga Neto, 2010). It is related to some conditions:

1. Social/behavioural: social relationships and interactions based on norms and values such as trust, care, empathy, attentive enquiry and tolerance;
2. Cognitive/epistemic: the need for both epistemic diversity and common knowledge or shared epistemic practices and commitments;
3. Information systems/management: the use of information systems and information management processes to support knowledge activities;
4. Strategy/structure: the need for the organization and its management to provide direction and structure.

In this way, socio-cultural indicators for enabling conditions of *social cohesion* are:

1. Social/behavioural: **cooperation** (presence of Associations, local groups, start-ups, new Companies);
2. Cognitive/epistemic: **shared knowledge practices and commitments** (research centers, schools);
3. Information systems/management: **knowledge activities on social networks** (sites, pages, groups of the place);
4. Strategy/structure: a **political vision of future scenarios** (urban planning and policies).

The Living Lab approach has been adopted in some circular cities to create the enabling conditions for participation and collaboration in urban regeneration processes. In the Geodesign process, the Living Lab approach is the framework, that substitute the "Stakeholders Input" of Steinitz (2012): we do not just accept stakeholder requests, but we activate a process of interaction and collaboration that becomes an integral part of the proposed decision-making approach.
The Living Lab approach is also useful to activate the enabling context: to identify and build the favourable context for the process to start and develop.
Participation and collaboration in spatial decision making are complex and require adequate and shared methods. Thus, Geodesign is both a process and a set of methods to cope with spatial planning.
In the context of Living labs, the geodesign method clarify the process and the stakeholder involvement.

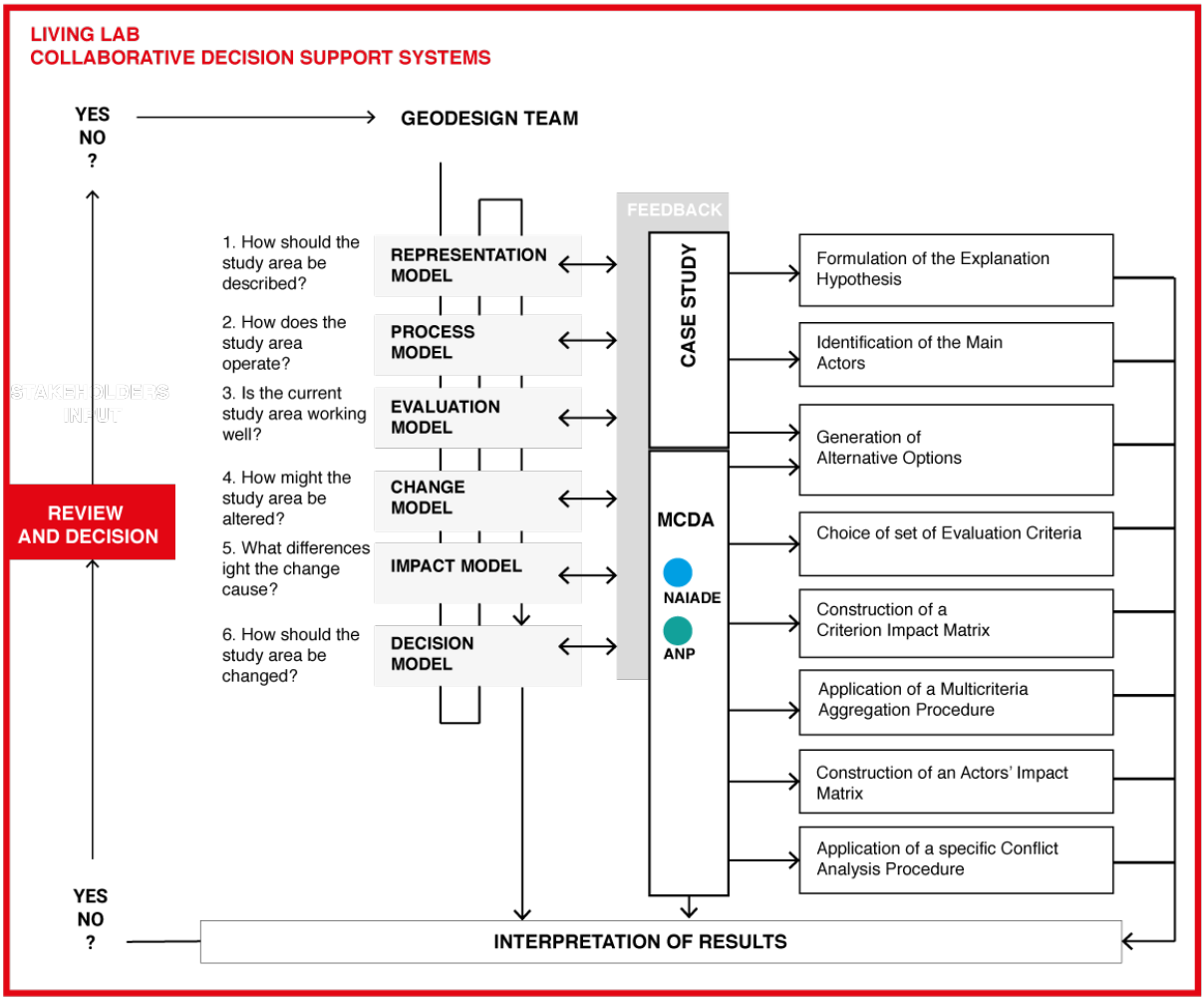


Figure 23. Integration of Methods for a collaborative decision support system: MFA and MCDA in a Geodesign process.

Evaluation MCDA to be applied to the different steps of the geodesign process:

- Analytic Network Process (ANP)
- NAIADE.

ANP is a Multiple Criteria Decision Aid (MCDA) method that allows outclassing the rigidity of the Analytic Hierarchy Process (AHP) (Saaty, 1980), taking into account internal and outer dependencies among sets of criteria (Saaty, 2005). The ANP multi-criteria method can grasp and assess the relationships among different phenomena affecting the decision-making process' stages.

ANP is, indeed, one of the alternative-based methods that can consider inner and outer dependencies among multiple criteria, therefore the interrelations between the economic, social, environmental and cultural dimensions. ANP method provides results of dependence and feedback within and between clusters of elements (Saaty, 1999). It makes composite priority ratio scales by individual ratio scales, representing relative measures of the influence of interacting elements on the control criteria.

of the influence of alternatives concerning the evaluation criteria.

The representation of the evaluation problem as a network of interdependent elements distributed in clusters follows three steps: (1) identifying the elements (alternatives and criteria), (2) grouping them into clusters, (3) determining mutual influences and bringing all this information together in a matrix.

Conclusions

Section 3 explored wastescapes evaluation, defining criteria, methods and tools to support a urban regeneration process. First, in Chapter 3.1, the evaluation goals for wastescape regeneration are discussed. According to the definition (Amenta & van Timmeren, 2018), following the circular economy paradigm that states waste is resource, wastescapes are resources too.
Hence, the circular economy and circular city perspectives are the theoretical framework for defining regeneration objectives. The circular economy framework does not yet have an unambiguous definition. It is also contested by some ecological economists. However, some circular economy strategies are said to offer significant reductions in environmental impacts. The doughnut economy goes beyond the circular economy, setting two thresholds within which society can flourish between the limits of the social foundation and ecological cieling. In this range, wealth should be more evenly distributed. Socio-economic inequalities are strong, especially in urban contexts. Cities are full of ghettos and gated communities. The marginalised, the urban wastes and the resource wastes are gods. Many European cities are adopting circular economy strategies and setting themselves the goal of becoming 'circular cities'. Amsterdam city doughnut punta molto alla partecipazione e all'inclusione sociale.
The capacities to be developed in an urban context with these objectives are the ability to develop strategies for looping, adaptation and regeneration.

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PART III

Waste metabolism in Naples

Introduction

Part I introduced some research strands that stem from the REPAiR research project, this study stem from: Resource management and wastescapes regeneration. Over four years, it developed a hybrid methodology that produced several research methods and results that mostly converged in of research collaborative decision-making processes.

The present **Part III** bridge the theoretical context of Part II with next the neighbourhood scale case studies of Part IV. In this case study, the focus area of the Naples pilot case of the REPAiR project, in the Campania region, in Southern Italy address some relevant issues in waste management and collaborative decision-making tools for the circular economy spatial implementation. Waste management in the Campania region has been at the centre of media communication for the last twenty years. The physiology of wastescape in Campania and Italy is subject to several factors: regulatory, economic, political, technological and social aspects. The underground economy plays a significant role in waste management worldwide (Hebel, Wisniewska & Heisel, 2014). In Campania, the illegal management of waste disposal has received a lot of media attention and news reports in books, films, and documentaries. Following the 2008 waste emergency, the waste management problems in Campania, the *Land of Fires*, the emergency, the perception of waste, the phenomenon of abandonment. Top down solutions in waste management in Naples areas lead to the construction of the disputed incinerator or waste-to-energy plant in Acerra (Naples) and the Chiaiano landfill, that caused strong disagreement, protests and struggles by the inhabitants. It was a garbage struggle *waste war* (De Rosa, 2018) under the push of the *state of emergency* (Armiero & D'Alisa, 2012). Both cases are mapped in the EJ Atlas (2015).In the last ten years, the Region has been facing the challenges of reduction (Waste Prevention Plan of 2013), recycling and recovery. Waste plans in Campania set out guidelines for municipalities to implement.

In addition to the criticalities linked to extraordinary waste management, and the issue of five million eco-bales stored in Taverna del Re (Villa Literno, between Caserta and Naples), the public authorities of Campania Region are dealing with polluted land to be reclaimed, polluter waters, abandonment of waste on the streets and highway borders, and the complex daily management due to the the lack of waste treatment facilities. At the same time, separate solid waste collection in Campania has significantly been rising along last ten years, and many NGOs and citizens developed a strong environmental awareness. After the waste emergency years, the waste management in Campania is marked by two main types of problems: (1) those familiar with many other Italian regions, due to regulatory aspects, and (2) those specific to the Region, where illegal traffics and criminality play a central role. The Land of Fire is a constellation of waste lands and a wastescape

In this case like in the next case study, illegal phenomena can't be addressed in this study, but the author is aware of the huge impact on all the waste management chain. Small local waste treatment solutions don't make a big difference in a region that is the most dense Italian one, but they are spreading and creating new values and have a socio-cultural impact. Closing the loops is one of the objectives explored in REPAiR projects.

From the permanent state of emergency, with environmental and civil-rights laws suspended, Naples became a different type of laboratory (D'Alisa, Armiero & De Rosa, 2014), in which people, administrations, stakeholders and scientists can find alternatives to waste management and address the injustices caused by the current patterns of contamination and exposure.

4 THE H2020 REPAiR PROJECT

Collaborative approaches for a circular waste management in the Naples case

Photo 4. Aerial view of the Metropolitan Area of Naples. In the foreground the airport, the historic city and the port. In the background Vesuvius, the hills of Vesuvius, the Partenio mountains and the Monti Lattari Park.

In the Campania Region, the end of waste emergency was formally declared, by the end of 2009. After decades of inefficient management and illegal disposal phenomena, hazardous waste dumped in agricultural fields in the vicinity of residential areas has caused environmental and human health damage. This widespread emergency led various groups of citizens to become aware of the important risks due to the environmental crisis. The demonstrations and popular protests were the first indicators of a new ecological consciousness and, simultaneously, associations and organized groups began to strongly claim the right to the environment and to health.

The socio-environmental conflict became very intense in the period between 2000 and 2011: the most clamorous local riots were 31, always radical (roadblocks, sit-ins, occupations, clashes), which lasted for months and forced the authorities to change or even abandon their choices (Martone, 2016). The Neapolitan waste emergency officially began before, in 1994, when criminal investigations revealed the inadequacy of the landfills operating in the region, sequestering most of them. Over the years, the waste started to overflow in the streets of Naples, because only a few dumps were functioning . inducing the national government to declare a state of emergency which led to the creation in 1994 of a special agency for the management of waste (the Commissariat for the Waste Emergency in Campania – CWEC) composed of technocrats with exceptional resources and power. Iovino (2009), D'Alisa et al. (2010); Armiero & D'Alisa 2012 and Berruti & Palestino (2020) have framed the Neapolitan waste crisis as a crisis of democracy (Armiero, 2021). Waste management in Naples led to a *waste war* (De Rosa, 2018). The research results on the so called Land of Fires show that the denounces for the violation of health rights are well-founded (Mazza et al., 2018; SENTIERI project, 2014). In a Region already polluted and economically disadvantaged, authorities located new waste facilities to solve the waste crisis, the landfill in Chiaiano and the incinerator in Acerra (close to Naples), through a military imposition, like Camorra (organized crime based in Campania Region) had previously done, pouring any sort of waste onto Campania lands (De Rosa, 2018).

The problems of illegal waste management in these areas comes with few circular waste management actions in the Campania region. Many of the objectives of the Waste Prevention Plan in Campania (Piano di Prevenzione dei Rifiuti in Campania) (Regione Campania, 2013) are not active, despite the "Rules for the implementation of European and national waste regulations" (Article 2), and declaration of pursuing through concrete actions the realization of this new economic model (Article 3).

The Separate Waste collection in Campania Region improved in last 10 years, but there is still a big gap compared to Veneto, that is the most performing Italian Region in Waste Management. The policies set by the regional authority in Campania should be even more effective, but the weakness of local institutions is one of the primary determinants of poorer performance (Garofalo, Castellano, Agovino, Punzo, & Musella, 2019).

After analysing more than 3500 appeals lodged at Strasbourg between 2014 and 2015, European Court has launched a process against the Italian Government in 2019, communicating right violations suffered by more than thirty people and five associations. The applicants denounce that, although authorities were aware of a real and immediate risk for people health, caused by the storage and the burn of hazardous waste in illegal dumping, they would not take adequate measures to reduce the danger, to effectively pursue the responsible of the pollution sites in the so-called Land of Fires, in Campania Region, in Italy. Furthermore, they accuse that the population had not advised about actual health risks.

Land of Fires constitutes a particularly complex contest expression of a deep territorial crisis of Campania Region (D'Alisa, 2010; Berruti et Palestino, 2019), but Italian as well. The term has been used for the first time in 2003 in "Ecomafia" Report of NGO Legambiente, and it is referred to the presence of waste illegally dumped in fields or on the borders of some streets, that, when burned, produce toxic smokes, spreading hazardous substances in the atmosphere and on surroundings areas, polluting soils and waters. Actually, the whole of Italy should be considered a Land of Fire, as it is shown in the map of waste treatment plant burnings in Italy, launched by Claudia Mannino, from May 2017.

“Ecomafia” Report of 2018 states that huge progress has been made in Italy, thanks to the new regulation that introduced “environmental crime”. Anyway, the Campania Region is the one with the highest number of environmental offences (4.382 in 2018, that represents the 14,6% of national ones). This situation represents a very relevant problem for public health and environmental researches have been carried out for years, to verify the relationship between the high number of cancer diseases and environmental conditions in the Municipalities of Land of Fire area. Research results show that the denounces for the violation of health rights are well-founded (Mazza et al., 2018; SENTIERI project, 2014).

Formally, the state of emergency for the waste crisis in Campania has been closed in 2009. Coupled with an evident crisis in the day-to-day management of municipal solid waste, illegal disposal of hazardous waste is a widespread phenomenon in the Campania Region, since the 1980s. Entrepreneurs, businessmen, politicians, authorities, companies that manage waste and criminal organization colluded in this affair.

In a Region already polluted and economically disadvantaged, authorities located new waste facilities to solve the waste crisis, the landfill in Chiaiano (Naples) and the incinerator in Acerra, through a military imposition, like Camorra (organized crime based in Campania Region) had previously done, pouring any sort of waste onto Campania lands (De Rosa, 2018).

In this context committees, movements and associations have born, both to fight for their right to health, and to act where institutions have not been able to solve problems. In a land where the parallel Camorra black economy has a huge control, some brave people are working to build alternative community models. While criminality is damaging the environment, grassroots movements are giving voice to a new awareness and sense of belonging to their territory. In this struggle against inappropriate management of waste, art has been a powerful tool to transmit messages of indignation and protest, shaping the dissent and, especially, the action.

Living Labs in Naples coped with the issue of linking wasted areas regeneration with the close in loop of waste metabolism. The solutions developed with local actors, public authorities and research group are planning strategies and landscape projects, that can be further seen in Russo et al. (2018).

In this tough context, the REPAiR project achieved many results both in research and in field work.

In this Section 4, the experience of REPAiR project concern two research activities as case study: The waste flow maps through the Activity-based Material Flow Analysis (AS-MFA), and the Geodesign workshops.

This case study explore materials and methods of the physiological system of wastescape at a large scale: the Naples focus area of REPAiR case, including the Municipality of Naples and ten more Municipalities of the Land of Fires. The methods are the AS-MFA, that implemented for the first time a spatial dynamic map of metabolic waste flows. Also, this maps are the status quo analysis of a multi-actor decision making process structured in the geodesign-based open-source software GDSE.

The materials analysed in this case are the Organic Waste (OW) and the Construction and Demolition Waste (CDW) flows.

The methods tested in this framework of wastescape regeneration are the AS-MFA, for UM study, and the GDSE tool, for the collaboration in multi-actor decision-making processes.

The broad framework of the methodological process is in co-creation. Co-creation is an integrated and iterative process (Mauser at al., 2013) that supports researchers, actors, stakeholders and decision-makers, which together identify site-specific eco-innovative solutions and strategies (EISs).

The three main columns of the co-creation interactive process are:

1) peri-urban living labs (PULLs): workshops which enable real life contexts interact with research institutions where different kind of knowledge about waste and wastescapes develop, test and implement place-specific Eco-Innovative Solutions (EISs) (Eriksson et al., 2005; Feurstein et al., 2008; De Bonis et al., 2014; ENoLL, 2016);

2) geodesign system support environment (GDSE): a gis-based platform with a sequence of phases that support a geodesign process (Arciniegas et al., 2016; Arciniegas et al., 2019; Campagna, 2014);
3) life cycle assessment (LCA), a sustainability assessment report on waste supply chains that measures socio-economic and environmental status quo indicators and the impacts produced by the EISs (Guineé et al., 2002; Taelman et al., 2018).
The EISs involve different dimensions of sustainability, i.e. social, environmental, economic and cultural, can be articulated in the categories identified in the REPAiR project for the development of eco-innovative solutions, according to the PESTEL formula: Political, Economic, Social, Technological, Environmental and Legal (REPAiR, 2018). Top-down, bottom-up and collaborative decision-making processes belong to the Political dimension. Economic dynamics find forms in the linear, circular and other forms of economy that define the urban metabolism. Individuals, groups, and communities, both permanent and temporary, define the Social system. Environmental and Technological solutions cross from the micro to the macro scale. Finally, regulatory aspects and existing laws influence the different levels of urban systems by placing constraints and limits or generating new possibilities for action.
The interaction between PULLs, GDSE and LCA is iterative and recursive. The PULLs have been a collective workshop where researchers, public institutions, stakeholders and other actors involved have discussed waste management and wastescapes. Hard and soft data have produced different outputs of knowledge, that have been processed and have become part of GDSE and inputs for LCA (Fig.1). PULLs allowed actors to express their preferences and there have been moments of knowledge transfer events have occurred. In the different phases of the research, the results from PULLs have been adapted to implement the GDSE platform, and GDSE allowed to carry out PULLs. LCA has been done based on local data and sustainability assessment reports on each key flow supply chain, comparing the status quo and the impacts of some solutions.
Urban metabolism of waste is the physiological system of the Land of Fire wastescape.

4.1 Objectives and methodology

The work of the REPAiR project is here presented in the study and test field of new methods and a tools for waste management, and, thus, for wastescape regeneration process. The methods and methodology fielded by REPAiR paved the way for new approaches to waste management, which along with interesting results. This case study goes through:

- The Activity-based Spatial Material Flow Analysis (AS-MFA) for CDW and OW;
- The implementation and tests of the Geodesign Decision Support Environment (GDSE).

The AS-MFA opened the black-box of resource flows, in this case of waste flows, mapping the data of the waste flows. The innovation is in the spatialisation of UM that allow to more specifically plan circular economy strategies involving directly actors and flows in the study area. It is used as the Status Quo phase of the GDSE software. Since the spatialisation of the quantities of waste that make up urban metabolism requires a careful and rigorous study of data, the main issue of AS-MFA has been related to waste data management. The two flows explored are here presented highlighting different aspects of the study. OW flows are presented in detail focusing on the actors and flows of the supply chain. CDW are studied presenting more general problems, common in all the country. Both flows are mapped in the GDSE and can be studied developing solutions and strategies to improve the local management toward circularity.
The GDSE is a collaborative decision-making tool, to use in the Living Labs workshops in iterative decision-making processes. Both at the multi-actor level and in academic research, the possibility of integrating urban metabolism with the regeneration of wastescapes has been hypothesised but not operationalised through the GDSE process. A focus on waste in art practices in the Land of Fires is explored to have a view on the social enabling conditions of the territory. In the Conclusions, an

integration is hypothesised, outside research results through the systematisation of unfinished waste buildings with the urban metabolism network of CDWs. Overlapping the two systems and finding evaluation criteria to guide circular strategies open the field to future developments.

4.2 The case of two waste flows in Naples

Considering the wastescape in Appadurai's semantic sense, the network of waste streams is a wastescape. Adding the Netzstad perspective we can say, further, that thus is a system of the physiology of the territory. The waste flows that we are going to analyse in the case study of the focus area of Naples, constitute, in this perspective, a wastescape. The problems created by the management of this waste have had and continue to have strong environmental impacts. Circular economy actions in this area would be strongly needed.
In the Naples case study, actual waste data provided by the ARPAC Waste Register were analysed. The Activity-based Spatial Material Flow Analysis was organised by clustering the flows according to the fraction of matter or waste. Waste producers were classified according to the economic activity to which the companies involved are registered.
Besides the collection quality system, the crucial points of the process are the correct separation of waste at the origin and the final treatment destination, i.e. the economic activities that should recycle in the most productive and eco-efficient way the secondary raw materials.
"The long journey of waste, from the kitchens of Rome and Naples to the north" (Ecosistema Urbano, 2019) attests to the irrational and unsustainable management of that part of the waste. However, it is correctly separated from the citizens. Over a third of urban waste consists of the organic fraction: leftovers from domestic kitchens, restaurants, bars, canteens (EWC 200108- kitchen and canteen waste), as well as waste from local and neighbourhood markets (wet) and mowing and pruning of gardens and parks (EWC 200201 – biodegradable waste). The MFA conducted under the REPAiR project (2019) emerged that two-thirds of organic waste fraction produced in the focus area is part of the Municipal Solid Waste (MSW). MSW includes families and small and medium-sized businesses with less than ten employees, whose waste is assimilated and collected with the households. This data underlines the importance of preventing food waste and the importance of the subjective contribution in avoiding it through responsible behaviours and correct management. According to the European directive on the circular economy (updated to 2018), the main priority is prevention for food waste, starting from reducing food waste at distribution chains and individual commercial and domestic users.
Furthermore, quality selective collection systems must be adopted to minimize landfill use. The importance of the correct separation of fractions affects all subsequent management phases. According to some technical references, organic waste of a percentage of non-compostable materials more significant than 10%, while not preventing their transformation into quality compost, can cause additional costs and management difficulties in the plants. Therefore, in addition to guaranteeing a more sustainable use of resources according to the principles of the circular economy, maximizing the allowable shares for material recovery also reduces environmental impacts: biodegradable waste sent to landfills produces greenhouse gases and leachate.
In REPAiR, the wastescapes have been classified according to the classes pointed out in Chapter 2.1. They have been mapped according different criteria and indexes per case study. The key concepts identified concerned the condition of abandonment, of indeterminacy, of transition. The REPAiR project offered the opportunity to think about waste areas through a classification. However, no common criteria defined European wastescape, both for different cultural perspectives and different spatial analysis carried out.

This made no possible to compare the flow indicators with wastescapes mapped, although in the first step (Study Area) of the Geodesign Decision Support Environment flow indicators are spatialised per area and population.

4.2.1 Organic Waste: Opportunities and challenges in Campania Region

The Total of Municipal Solid Wwaste produced in Campania in 20215 was **2.567.346,78 t**, of which:

- Not separated= 1.318.900,69 t
- Separated= 1.246.050,10 t

The separate collection of organic waste (OW) in Campania is average a percentage of 49% (ARPAC, 2015). Southern Italy is globally improving in separate collection. The last ISPRA report (2020) states that the South exceeds 50% of separate collection, but it is still far from Treviso, the most virtuous city in Italy, with 86.9%. The management is still far from the new European targets.
However, the main problems in managing this waste flow in Campania Region today are linked to the treatment. The paramount need expressed by Authorities is to build plants capable of receiving such waste and turn it into energy, soil improvers, or bio-based products. As of 2019, the plant equipment is not distributed evenly over the national territory. In some cases (such as Lazio and Campania), this determines the need to transfer the collected quantities mainly to plants located outside the regional territory. From the Material Flow Analysis, we know that the OW produced in the Naples focus area corresponds to 75530 t (2015) (Figure 24). This comprises food waste and biodegradable green waste that correspond to the food waste (EWC 200108) and green waste (200201) (ARPAC, 2015). Of this total amount, 59765 is composed of source-separated OW and the part of OW lost in the residual solid waste (RSW). Organic waste produced by companies amounts to *just* 15765 t. Although this is a minor component, it has the more significant potential for recycling according to circular business models because of its degree of purity compared to OW from MSW. In addition to the organic material mix, component analysis of OW from MSW amounts at more than 15% (source: PRGRU - Piano Regionale di Gestione dei Rifiuti Urbani, 2016) consequent problems in the composting or biogas plant treatments. In the following table the percentage of OW lost in RSW, according to an estimation based on Population (**Error! Reference source not found.**) (PRAGERU, 2016). This is the avoidable organic material lost d ue to wrong households behaviours.

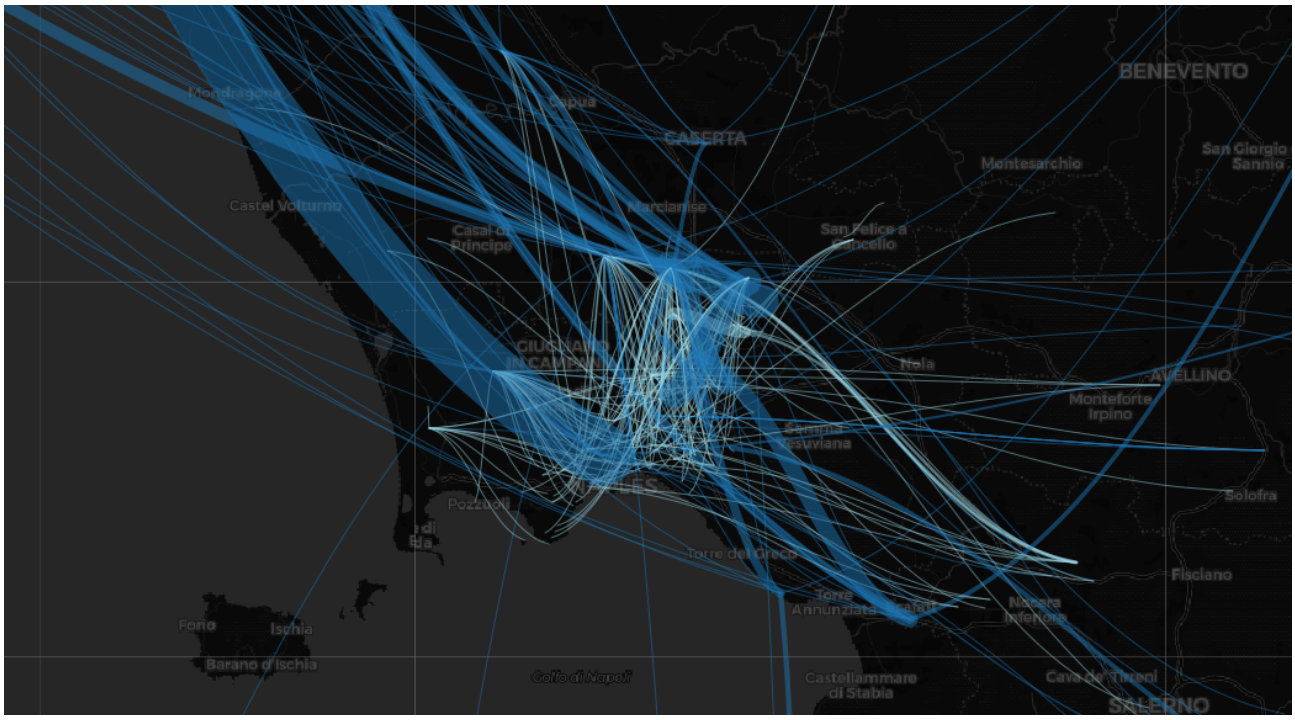

Figure 24. Organic Waste flows from MSW and Companies from the Municipalities of Acerra, Afragola, Caivano, Cardito, Casalnuovo di Napoli, Cercola, Crispano, Frattaminore, Napoli e Volla. Author's elaboration. Source: GDSE (REPAiR, 2019). Data source: ARPAC.

Merchandise analysis of undifferentiated fraction from MBTs.

From PRGRU of the Campania Region page 95: 'Without prejudice to the problem of the representativeness of the product analyses carried out, it is possible to identify some elements of relevance for the analysis of the tables above. In particular, it is noted that - the organic fraction in undifferentiated waste from 2012 to 2015 generally tends to decrease, particularly in the STIRs of Caivano and Giugliano, where it goes from values around 30% to values around 20%. The Tufino MBT is an exception in this respect, where the organic fraction remained constant at around 20%, as did the Santa Maria Capua Vetere MBT. The same trend was recorded at STIR Battipaglia, which went from 18% in 2012-2013 to 12% in 2015. For the Avellino MBT, the only analysis available is for 2015, and the percentage of organic fraction shows an anomalous value of 35.5%, in contrast to the individual collection performance of this province. Therefore, this value was not used to define the regional average for 2015.

This percentage was considered too approximate because it does not consider the 11 municipalities considered but all 550 in Campania, and it does not consider the Caivano TMB, to which most of 200301 of the municipalities considered goes.

For the data collection for the Life Cycle Assessment (RAPAiR, 2020), the % of OW in 200301 was calculated according to the % of total OW produced by households varies according to population (source: Regional Municipal Waste Management Plan, 2016) page 91.

The ARPAC study in the PRGRU estimates a % of OW according to the population of the municipalities:

population	**% OW in MSW**
>5000000	**29,7%**
>50000:	**33,7%**
>20000	**38,2%**
>5000	**39,7%**

<5000	**36,7%**

Thus, the amount of OW lost in RSW correspond to:

OW in RSW	Municipality	Tonnes
33,7%	Acerra	59578
33,7%	Afragola	65290
38,2%	Caivano	37865
38,2%	Cardito	22733
33,7%	Casalnuovo di Napoli	50046
33,7%	Casoria	77874
36,7%	Cercola	18465
39,7%	Crispano	12359
39,7%	Frattaminore	16193
29,7%	Napoli	978399
36,7%	Volla	23596

The 11 municipalities in the focus area sort to eleven first destination plants, that eventually send OW to 51 final plants (Figure 25). Only from the municipality of Naples, they go directly out of the region to eight destination plants (DRU 2015 - mud destinations of municipalities).
The destinations are classified as:

1) Anaerobic Digestion
2) Composting Plant
3) Mechanical Biological treatment (MBT)
4) Recovery Plant
5) Incinerator
6) Landfill.

Data about collecting methods and frequency of collection can't be provided by ARPAC. The collection data must be asked to local waste collection companies. They are many different companies:

Table 11. Collection Companies of OW and RSW in the Naples focus area.

MUNICIPALITY	WASTE COLLECTION COMPANY	WEBSITE
Acerra	TEK.R.A.	https://www.tekraservizi.eu/comuni-servizi/
Afragola	BUTTOL	http://www.buttolsrl.it/portfolio/
Caivano	BUTTOL	http://www.buttolsrl.it/portfolio/
Cardito	Energetika Ambiente	http://www.energetikambiente.it/
Casalnuovo di Napoli	Ecologia Falzarano	http://www.ecologiafalzarano.it/
Casoria	Casoria Ambiente	http://www.casoriambiente.it/
Cercola	Tekno Service	https://www.teknoserviceitalia.com/
Crispano	BUTTOL	http://www.buttolsrl.it/portfolio/
Frattaminore	GNP	http://www.gpnservizi.it/gpn/S.html

Napoli	ASIA	https://www.asianapoli.it/
Volla	Langella Mario	https://www.langellamario.it/

From the AS-MFA of OW produced in the 11 municipalities considered, the biggest problem is the lack of facilities in the Campania Region. Due to this shortage, waste is sent for disposal outside the region, with strong impacts and costs that have been assessed through LCA in the Sustainability assessment (D.4.7, REPAiR, 2020). The collection, transport distances, and the percentage of waste type at the final destination plants were analysed to carry out the assessment. The LCA has been carried out on the OW from the household, mainly the mix of food and green waste separately collected from households (SS-OW_ EWC 200108+200201).

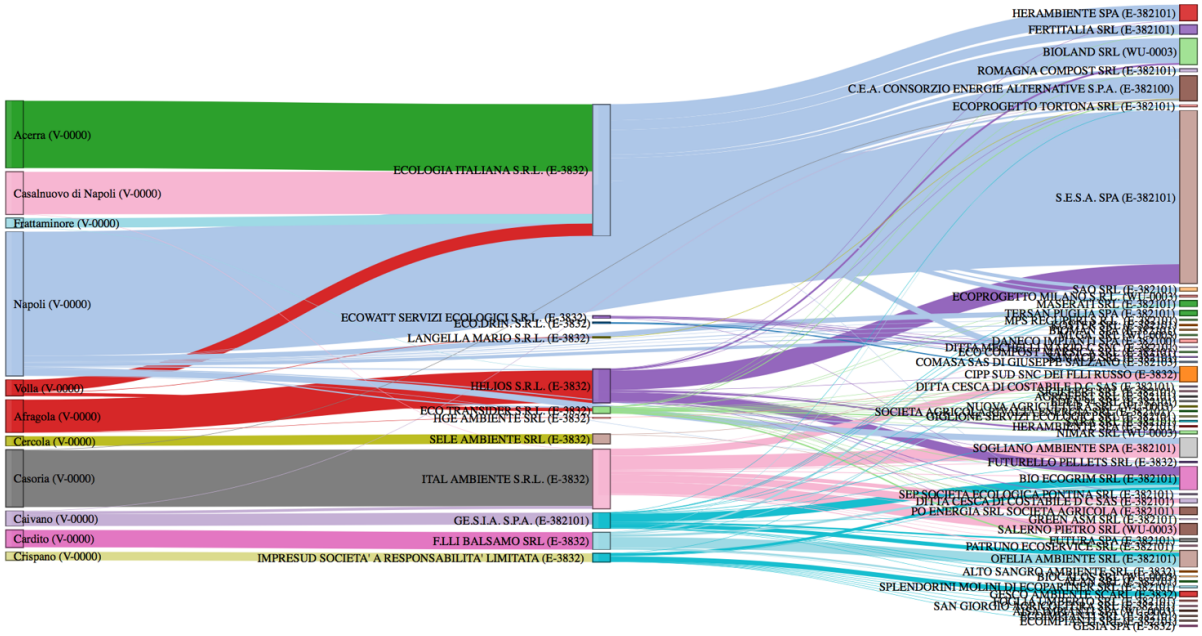

Figure 25. SSOW – Sankey Diagram. Actor level from GDSE. Author elaboration.

It is difficult to determine from each municipality how much waste goes to reach Final Destination. Given an origin, it would be necessary to consider the % of food waste entering the plant1. From plant one, this % is divided into what % to the final destinations. The scenario is complex.

Example. The Naples collection (for SS-OW) has 14 different first destinations: of which eight destinations are the final destination (outside the region), the other six intermediate destinations in the Campania Region handle the waste and then send it to multiple second destinations ()

From the analysis carried out for the MFA and the data entered into the GDSE, we can derive: the location of the points of origin and facilities and the flow connecting them (type and quantity) (Fig.3).

Figure 26. SSOW from MSW produced in the municipalities of the Focus Area (2015 data, source ARPAC).

Considering the incidence of out-of-region transport relative to this flow, the network of roads for transporting these flows was modelled, since from sample analysis, the actual length is at least 1.2 times the linear distance (Figure 27).

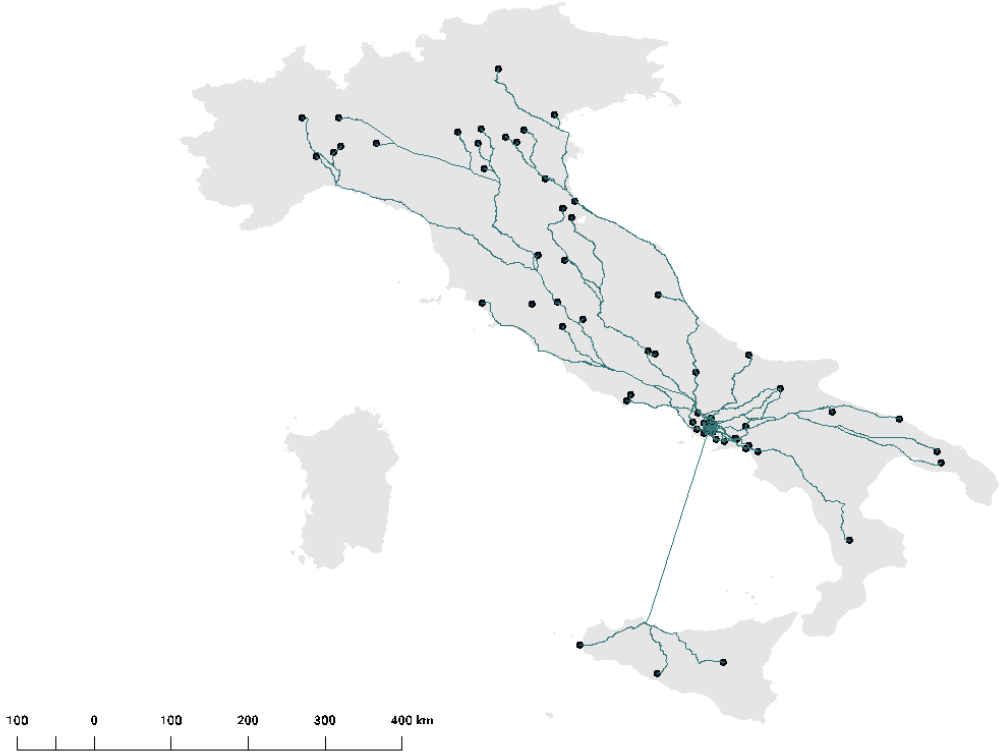

Figure 27. Network of roads likely to be used in transporting the SS-OW flow from the origins to the final destinations. (transport data elaboration V. Bouzas. Graphic of the author)

Distances covered for the disposal of source-separated organic waste produced by the eleven Municipalities of the Naples the focus area are: 41297 km.
The fraction of food waste in RSW that through Mechanical Biological Treatment (MBT) plants becomes FUT (EWC 190501 "non-composted fraction of municipal and similar wastes" or 190503 "off-specification compost") was not considered. No MFA was done from MBTs to landfills, where 98% of the FUT ends up. In addition, the TMB quantity data (2015) provides data on the total waste treated by each plant. As with SS-OW, considering the second destination of FU from each MBT plant would also require tracing the estimated % of OW to RSW for each municipality.
If we would consider distances of OW from TMB to landfill, we would need to define to which EWC 19 and, then, to extend the MFA.

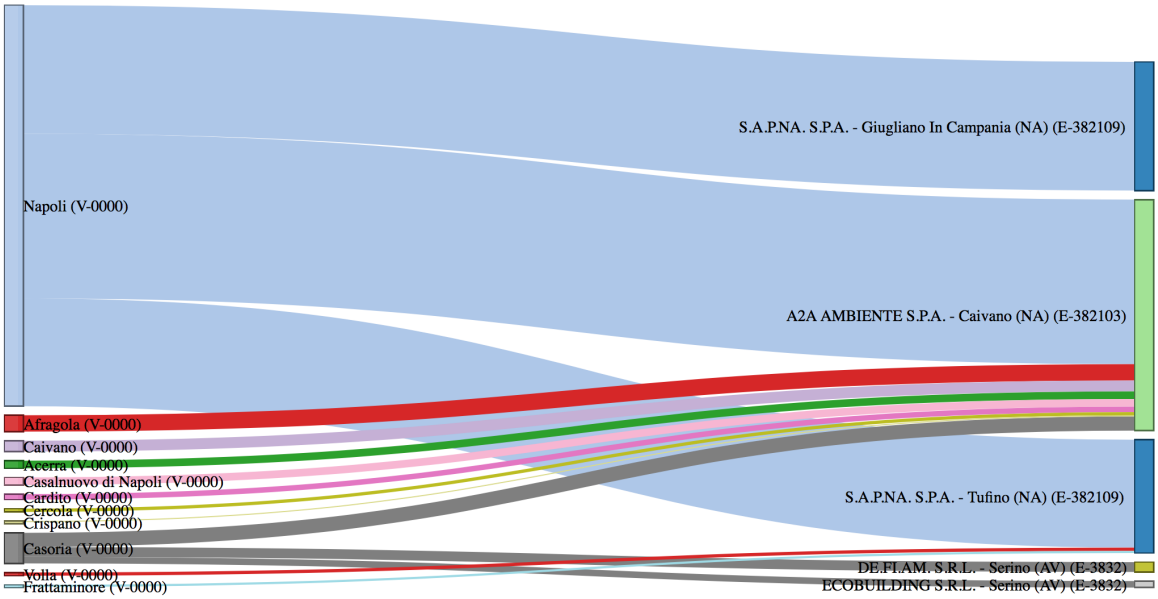

Figure 28. Food waste in the Residual Solid Waste - Sankey Diagram from GDSE. Elaboration of the author.

The distances in GDSE are represented as linear arcs (Figure 29).

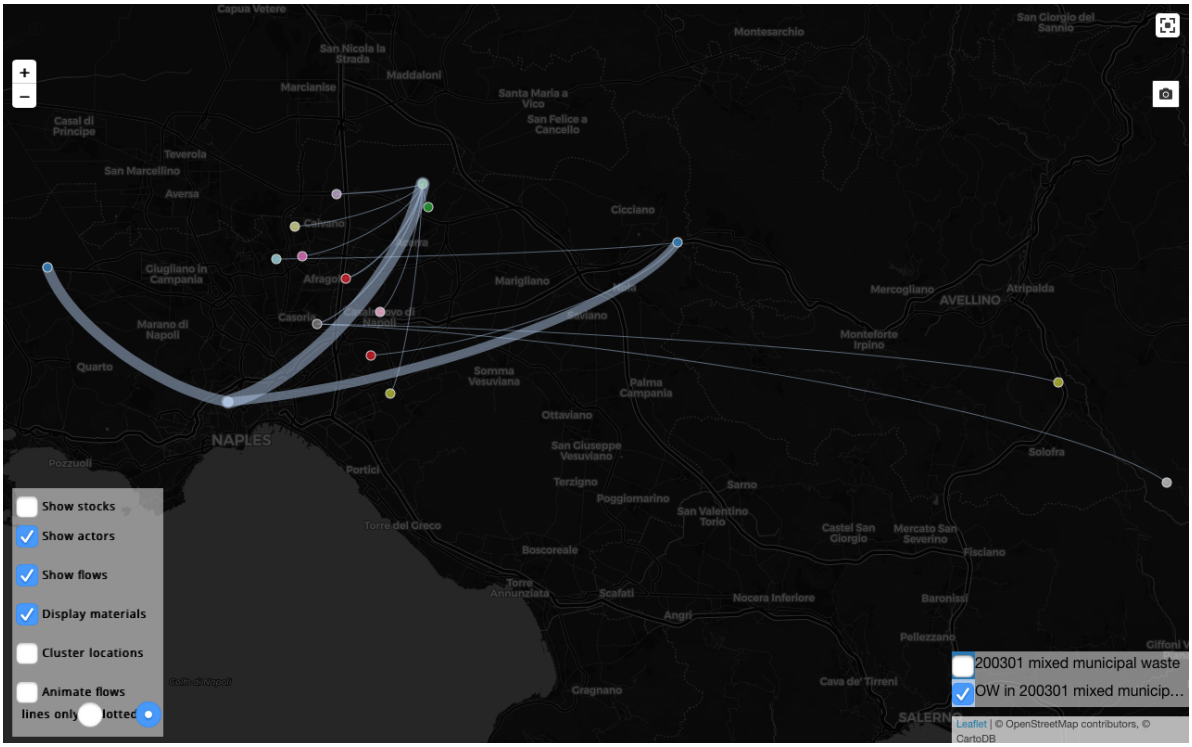

Figure 29. OW in MSW produced in the Focus Area municipalities (2015 data, source ARPAC). Elaboration of the author.

The actual distances were calculated in GIS (Fig.8) on the basis of the road network connecting origins and destinations.

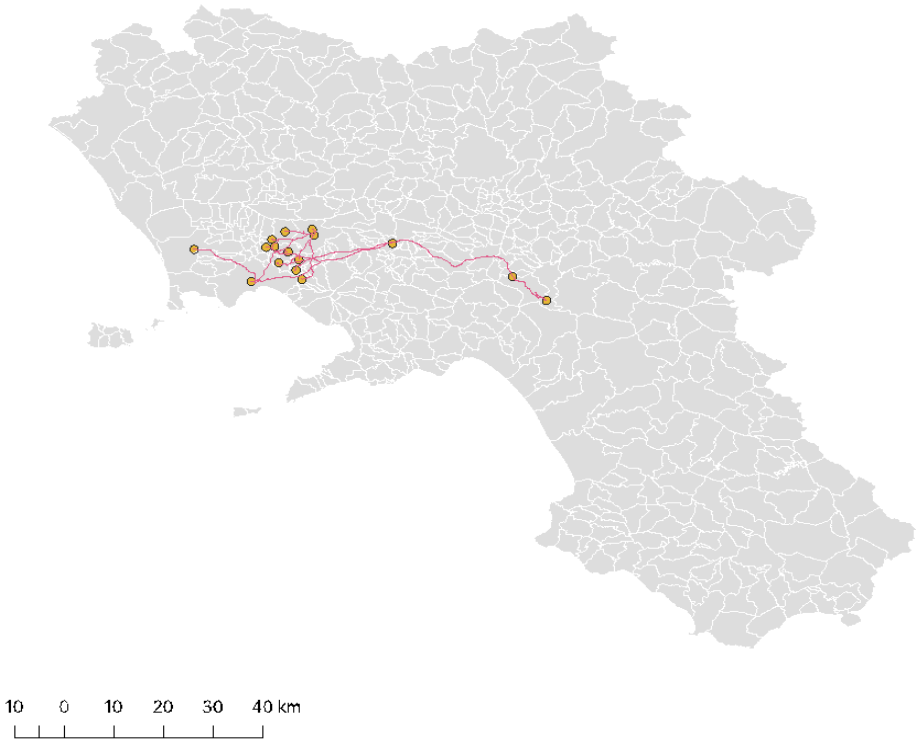

Figure 30. Transport distances covered for disposal of the RSW flow from the Municipalities to the TMB first destination. (Transport data elaboration of V. Bouzas, graphic of the author).

Distances covered for the disposal of Residual Solid waste produced by the Municipalities in the focus area: 340.92 km
It is clear that shortening the disposal chain for Source Separated Organic waste, as well as reducing it, leads to a significant reduction in environmental and economic impacts. In D.4.7 the LCA shows the benefits of treatment in the region through composting or anaerobic digestion. The solutions to make the supply chain short and circular proposed in the REPAiR project follow several actions already in place. In 2020, the situation of organic waste management in Campania has slightly improved.
In 2011, a research project was carried out in Scampia by the Department of Sociology with a participatory approach to improve separate waste collection.
Today, GESCO is planning a 5000 t/y composter to be built in the outdoor areas of the Secondigliano prison. This composter could employ 10 inmates and absorb all the organic waste produced by Municipality VIII in one year.

4.2.2 Construction and Demolition Waste: Opportunities and challenges in Campania Region

Construction and demolition waste (CDW) is one of the most significant waste streams in the area of special waste in the EU. It correspond to the group of EWC (European Waste Codes) 17. The European Commission legislation (Waste Framework Directive) requires a minimum recovery of non-hazardous waste CDW of 70% by weight by 2020.
The waste stream of CDW (EWC 17) accounts for around 40% of the total waste produced in Europe (Deloitte, 2017). In Italy this amount corresponds to approximately 52 million tons of non-hazardous waste (ISPRA, 2015). According to official data, 75% of these materials are officially recovered, but there are many complexities in the whole chain, mainly related to bureaucratic processes and regulatory ambiguities, which do not facilitate the re-use of such materials in the logic of circular economy. There are also several shadow flows in the construction sectors in Europe like in other countries (Hebel et al., 2014), that escape to track and, thus, they are not taken into account in recycling rate statistics (Legambiente, 2019).
A crucial challenge is to trigger the market of Recycled Aggregates (RA) that are produced from inert waste treatment plants, but regulatory conditions obstruct it and their reintroduction in metabolic processes. The italian Nation Association of Building Constructors (Associazione Nazionale costruttori Edili – ANCE) with supraregional waste observatory (Osservatorio Rifiuti Sovraregionale - O.R.So.) have developed a project to improve CDW management and RA market introducing a national open source platform Borsino Inerti connected to O.R.So., that is a mandatory system used by companies in waste management sector.Companies that are already required to fill forms in O.R.So. will be able to interact with construction companies or free professionals interested in buying certified recycled materials. RA can generally be used in many landscape architecture works, road fills, or can be recycled to make new building materials.
The Campania Region production of special waste stands at around 6.8 million tons, 4.9% of the national total. We refer in general to CDW even though it would be advisable to make a distinction upstream. Each construction or demolition activity has a different supply chain, and the processes that should not be assimilated because they produce different qualities of waste. While in the construction site to divide the scraps or by-products mainly concerns the logistics, in the classical or selective demolition phase there is the problem of the separation of the non-dry parts and, therefore, of the selection of the material for the subsequent classification by EWC. In the REPAiR project, Strategies have been studied to improve the recovery cycles of CDW in the wastescape of the peri-urban area of North Naples (REPAiR, Deliverable 5.3, 2018). Considering that the largest fraction of CDW is composed of inert aggregates, the "Beyond INERTia" Strategy introduces a set of Eco-Innovative Solutions to activate specific weak points in the chain of recycled aggregates in Campania. Recycled Aggregates are materials composed

of aggregates from construction and demolition waste. In conglomerate and mortar technology, the aggregates are both cement and other binders, and all those materials (such as sand, gravel and crushed stone) that do not undergo any chemical modification during the binder drying and hardening phenomenon (Treccani, 2018). Considering the two flows of the same type of CDW compared to the fraction produced in urban areas, i.e. urban waste, and that produced by companies, or special waste, two distinct issues emerged in the area under study:

- the abandonment of CDWs, produced by private individuals and small businesses, along roads, in urban areas and in non-traffic spaces;
- problems in the aggregate recycling chain.

Among the main objectives of the Metropolitan Area of Naples there is the contrast of the phenomenon of unformal or illegal disposal, therefore the prevention and the regeneration of wastescapes. The Beyond INERTia strategy, therefore, promoted a set of actions and interventions, so called *eco-innovative solutions* (EISs), to act on the two aspects: on the one hand, to increase the sites for free delivery of CDW, thus reducing the transport costs for customers, on the other hand, to cope with the problem of CDWs produced by companies, which constitute the most relevant part of this flow.
The product most currently obtained from the recycling of aggregates are the Recycled Aggregates. The most relevant problems seem to be in the boundary conditions more than in the recycling of these materials and the sale of these products, which although economically advantageous compared to Natural Aggregates, is often not preferred on the local market for various reasons.
CDW represents the most significant flow in Italy, equal to 40% of the total Special Waste with almost 52.7 million tons of non-hazardous CDW (ISPRA, 2015). Although at national level 76% is recycled in 2012, 24% still ends up in landfills (ISPRA, 2014). The total of CDW recovered in the bridging operations amounted to approximately 160,000 tons in 2012. Looking at the data on the production of hazardous and non-hazardous special waste, it is clear that the production of non-hazardous special waste is mainly due to CDWs. A diagram of an Activity-based Material Flow Analysis of those CD flows mapped in the 11 municipalities of MAN studied in the Naples case study of the REPAiR project (Figure 31).
In Campania they correspond to 43.3% of the total of special waste (ARPAC, 2015). The CDW, besides the rubble produced by natural disasters (earthquakes, hurricanes, floods etc.), are produced by different activities: construction, maintenance or demolition activities. The management of each construction phase can make the difference in the quality of the waste produced. The "shadow flows" are an international problem in waste management (Hebel et al., 2014). In accordance with Article 189 paragraph 3 of Legislative Decree 152/2006, only companies that produce hazardous waste and those that produce non-hazardous waste with a minimum number of employees greater than ten, are obliged to the MUD Environmental Declaration model (REPAiR, 2018, D.3.3, p.143-147).
This is the main reason why it is not possible to have a complete picture of special non-hazardous waste, for small companies exempt from MUD.
The CDWs have two possible destinations according to the legislation:

- Material recovery for road foundations;
- Disposal in landfills.

One of the firsts inert waste dumps in Italy is the Monte Testaccio in Rome. It is an artificial hill of around 53 million broken amphorae accumulated on an area of 20,000 square metres at its base and with a volume of 580,000 cubic metres between the 1st century BC and the 3rd century AC.
While inert waste can't be sold easily after being recycled, in Italy there is a huge amount of quarry material extraction, of which mainly sands and gravel. The quantity of material produced in quarries and the costs are not excessive are one of the reasons that does not favour the market of recycled aggregates. In Italy there are about 2,500 quarries of aggregates (out of more than 4,700 quarries in total) and at least 14,000 abandoned, half of which are ex-sand and gravel quarries (Tab.5) (Legambiente's Recycling Observatory Report, 2017). Sands and gravels are 39.6% of the material extracted in 2014 (ISPRA).

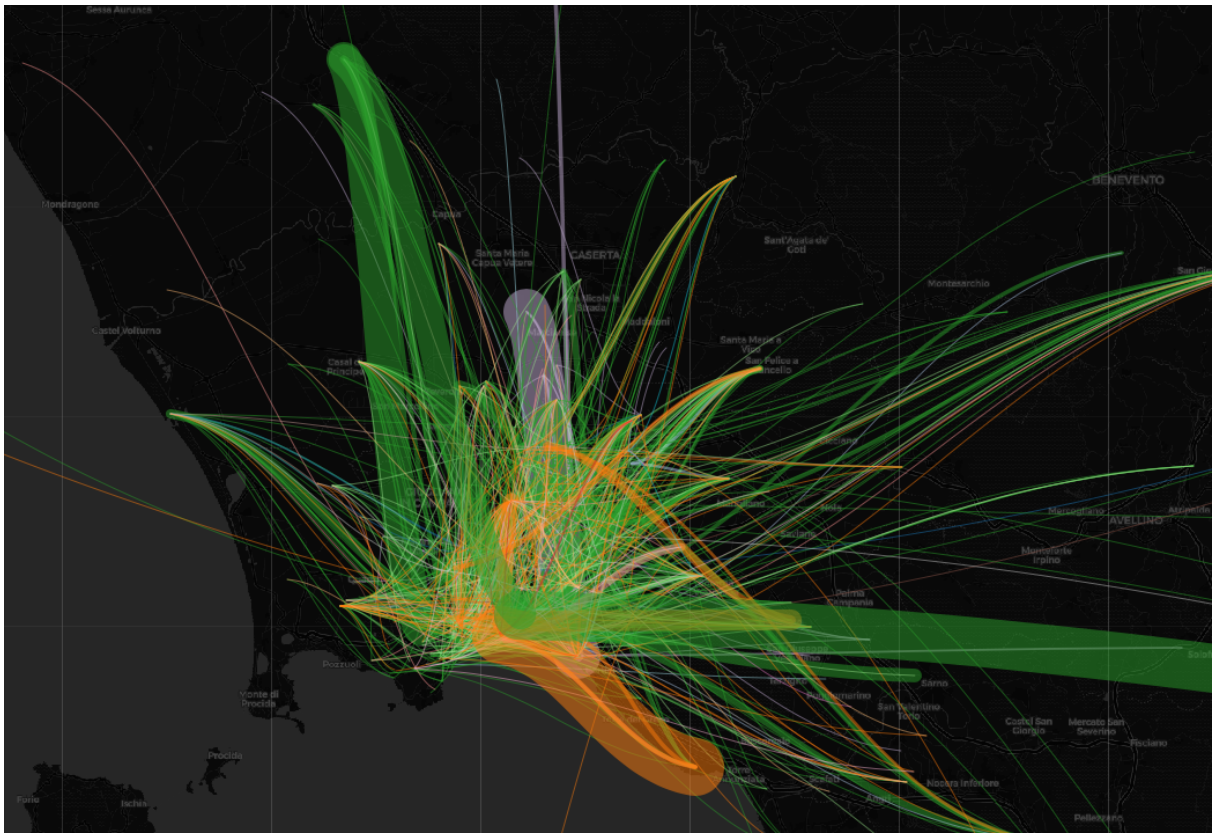

Figure 31. Organic Waste flows from MSW and Companies from the focus area Municipalities. Data source: ARPAC. Author's elaboration in GDSE (REPAiR, 2019).

Most of the quarry materials could be largely replaced by the recovery of C&D waste. Since 2009, the Legambiente Quarry Report has been monitoring the situation of Italian quarries by region.

Many regions, including Campania, do not have a quarry plan. The turnover of around EUR 5 billion a year in the aggregates sector alone is remarkable. And even more incredible is the fact that, in the face of such significant impacts, concession fees are extremely low, and in the regions of southern Italy they even quarry for free.

Legambiente points out that the last regulatory intervention by the State in the sector was the Royal Decree of Vittorio Emanuele III in 1927. For the association, the three choices for relaunching the sector are: strengthening land protection and legality by means of a national framework law; establishing a national minimum fee for quarry concessions to balance public and private earnings and protect the landscape; and reducing quarry levies by recovering inert materials from the construction industry.

In 2013 the Technical-Economic Association of Ready-mix Concrete (ATECAP) produced a report on the assessment of the use of recycled aggregates for cement production. The report describes the use in manufacturing and the related critical issues. The main critical aspects in the chain of recycled aggregates are: bureaucracy, lack of demand, illegality and non-application of certain laws, fragmented offer, products not available in a convenient transport radius, limited knowledge of technical characteristics, cost high transport, property incompatible with technical standards (ATECAP, 2013).

The inert waste recycling has a number of advantages:

- public administrations and local authorities, which can safeguard the territory by increasing recovery activities and limiting the use of landfill and the opening of new quarries for natural aggregates;
- for companies in the construction sector, which can deliver waste to recycling plants at lower costs than landfills and, at the same time, obtain materials that, for the same performance, are cheaper than natural materials;

- the protection of the natural environment.

However, there are still many obstacles preventing the sector from gaining momentum and, consequently, becoming an active component in the mechanism of the circular economy.
A review on the efficiency in the management of Circular Economic practices regarding the **CDW** (Menegaki et Damigos, 2018) provides results (Table 12) that offer a verification concerning the issues that emerged and a reference for future research developments.

Table 12. Production and management of CDW. Actions and effectiveness. Source: Menegaki et Damigos, 2018.

INFLUENCE IN THE PRODUCTION OF CDW		**EFFICIENCY IN THE MANAGEMENT**	
Negative (production decreases with these factors)	Positive	Positive	Negative
Specific legislation for CDW Waste legislation Non-legal initiatives for CDW Good building site practices	Public Works Construction of buildings Demolition of buildings and renovations Natural disasters Lack of communication between the actors of the process Lack of knowledge and behavior of workers in the sector	Specific legislation for CDW Waste legislation Strengthening of laws Accurate data reports Treatment capacity Economic benefits Non-legislative initiatives PPP for treatment Eco-design Fees / cost on landfills economic incentives for management Research on the application of CDW Green purchases Pre-demolition checks In-situ sorting	Recycling / recovery costs Lack of standards and certificates for recycled building materials Lack of knowledge and behavior of workers in the sector Time and costs for selective demolition and in situ sorting Cultural resistance High availability and cheapness of natural materials Low attention to impacts Illegal dumps

In Italy, there are several obstacles in the use of recycled aggregates are.

- Lack of confidence in the use of products derived from waste.

Although recycled aggregates now guarantee the same performance characteristics as the natural aggregates used in road works, their origin from waste induces an instinctive diffidence in the potential user, based unfortunately also on illegal practices that have sometimes occurred in the country. In fact, the waste that has not successfully completed its recovery treatment can, if used instead of traditional building materials, create serious problems for the construction company, both legal (illegal trafficking of waste) and technical (failure to accept the materials by the construction managers). It is therefore important to distinguish a proper recycling activity, which leads to the production of quality aggregates, real construction materials, from activities where C&D waste is used as such or after simple volume reduction treatments.

- Lack of reliable data on inert waste production.

The prerequisite for proper planning of inert waste management activities is the quantification of the volumes produced. In the case of construction and demolition waste, and inert waste in general, this quantification is particularly difficult. The official CDW production data provided by ISPRA are in fact only estimates and it is conceivable that illegal practices still exist. Some intervention on the part of the public administrations would be useful (e.g. providing the Administrations with a document containing a compulsory estimate of the quantities of waste to be produced and their fate - a management plan for

on-site waste - for the issuing of building permits) in order to bring to light all the quantities of waste produced by building renovation and demolition activities. Where introduced, this tool has been particularly effective.

- Lack of updated technical tools (specifications)

One of the main reasons for the reduced large-scale production of recycled aggregates and the widespread use of recycled aggregates may be the absence or lack of specific tools, such as special specifications, updated to the harmonised European standards for the sector. The public works sector therefore needs to ensure that the special specifications are updated on the basis of the latest European technical legislation, which no longer distinguishes between aggregates on the basis of their origin, but on the basis of their characteristics (obviously declared in the CE marking of the product).

- Absence of the entry "recycled aggregates" in the price lists for building works

The introduction of the entry "recycled aggregates" in the price lists for construction works would help to facilitate their use (few Chambers of Commerce have updated their prices to date).

- Poor waste separation at source and use of selective demolition practices

Traditionally, demolition activities in Italy do not involve much effort in sorting the different types of waste at source. On larger sites, the hazardous fraction of waste, the ferrous fraction and sometimes even the woody fraction are separated, while little is done on the remaining waste. In fact, the practice of selective demolition is non-existent. This involves the planning of demolition with an important initial phase of disassembly and separation of the main building components, which should be directed mainly towards reuse.

- Poor source separation of waste and use of selective demolition practices

Traditionally, demolition activities in Italy do not put much emphasis on sorting different types of waste at source. On larger sites, the hazardous fraction of waste, the ferrous fraction and sometimes even the woody fraction are separated, while little is done on the remaining waste. In fact, the practice of selective demolition is non-existent. This involves the planning of demolition with an important initial phase of disassembly and separation of the main building components, which should be directed mainly towards reuse. This means that the CDW coming out of construction sites is particularly heterogeneous and that the recycled aggregates produced by their treatment, despite the state-of-the-art technology used, may contain undesirable materials in excess of what is allowed by the technical standards for the sector.

- Lack of taxation of extractive activity

Among the economic instruments used, especially abroad, to favour the market of secondary raw materials, taxation on the extraction of virgin materials plays an important role. In fact, the consequent increase in the cost of virgin materials could favour their use only for uses where higher aggregate performance is required (e.g. concrete), leaving recycled aggregates and reused soil (treated or not depending on their characteristics) for other uses (e.g. road construction and filling).

- No prohibition or obligation to contribute to the landfilling of inert waste

Another policy instrument, which has proved to be very effective in the countries where it has been adopted, is the introduction of a landfill ban on inert waste into national legislation, which would foster the subsequent development of recycling activities. The introduction of a landfill tax would also produce results by making recovery more competitive, although much would depend on the size of the tax.

- Obligation to perform analyses for waste sent for recovery/recycling

Law Decree 91/2014 "Competitiveness Decree" converted into Law n.116 of 11/08/2014, which came into force on 18 February 2015, requires the analytical characterisation of waste classified with specular EWC codes. Table 1 of Ministerial Decree 27/09/2010 "Criteria for waste eligibility in landfills", allows "mirror" CER codes, such as 17 01 07, 17 05 04, etc., to be conferred in landfills for inert waste without prior characterisation. The current legal framework therefore provides for an obligation to carry out analyses for waste sent for recovery/recycling and an exemption for waste sent for disposal, which clearly penalises recovery/recycling, particularly for waste produced by the micro-renovation of houses. It must also be considered that often the waste is delivered to recovery facilities in small quantities (e.g.

in cases of building renovations), which should however be characterised by the waste producer. This cannot be done because the cost of analysis would be much higher than the cost of delivering the waste.

- Adoption of End of Waste criteria

The Waste Directive 98/08/EC introduces the concept of End of Waste with the aim of setting technical and environmental criteria to determine when, after certain recovery operations, a waste ceases to be a waste and becomes a product no longer subject to waste legislation. Setting clear and precise criteria should encourage the production of recycled products and reward those who invest in the quality of their products. To date, however, End of Waste criteria for construction and demolition waste have not yet been defined at European level and it is now clear that the Commission intends to leave this to the Member States.

- Implementation of GPP

DM 203/03 introduced the obligation to use recycled materials by the public administration, but in fact this decree has never been applied. It turned the obligation to use them into an invitation to public contracting authorities to adopt voluntary tools (Green Public Procurement - GPP, or so-called green purchasing) to favour, in the award of contracts, companies that use materials meeting the minimum environmental criteria. Public authorities have an important role to play in the market for recycled aggregates by directing and stimulating demand.

According to Ispra data, the number of operational landfills for special waste in Italy in 2016 was 350. Of these, 171 were landfills for inert waste (48.9%), 167 landfills for non-hazardous waste (47.7%), and 12 landfills for hazardous waste (3.4%). Compared to 2015, the number of operational landfills for inert waste decreased by 6 units, and those for non-hazardous waste by 9 facilities; the only increase, by one unit, concerned landfills for hazardous waste.

At the national level, in Italy in 2017, the quantities of CDW (EWC 17) disposed of in landfills amounted to 2.4 million tonnes, of which almost 2.2 million tonnes of non-hazardous waste and 270 thousand tonnes of hazardous waste. The quantities pertaining to this sector represent 20.1% of the total waste disposed of nationwide.

Compared to 2016 (approximately 2.9 million tonnes), there has been a decrease of approximately 460 thousand tonnes, or 16%.

Of the total construction and demolition waste, 66.4% is disposed of at inert waste landfills, 30.8% at non-hazardous waste landfills and the remaining 2.8% at hazardous waste landfills.

An analysis of the data by geographical area shows that 54.4% of the total (1.3 million tonnes) is disposed of in plants located in the North, 21.8% (about 527 thousand tonnes) in the Centre and 23.8% (576 thousand tonnes) in the South. The absence of landfills for inert waste in Campania stands out.

As regards non-hazardous waste, 74.7% is disposed of in inert waste landfills, 24.4% in non-hazardous waste landfills and the remaining 0.9% in hazardous waste landfills. This amount is mainly composed of excavated soil and rocks (170504; 1.4 million tonnes, 63.8%), mixed CDW (170904; 362 thousand tonnes, 16.8%).

From these topics, discussed in the framework of the REPAiR project, were summarized hierarchically in relation to the Pyramid of waste treatments (Figure 32), linking them to the main themes: prevention, preparation for reuse, recycling, recovery and disposal.

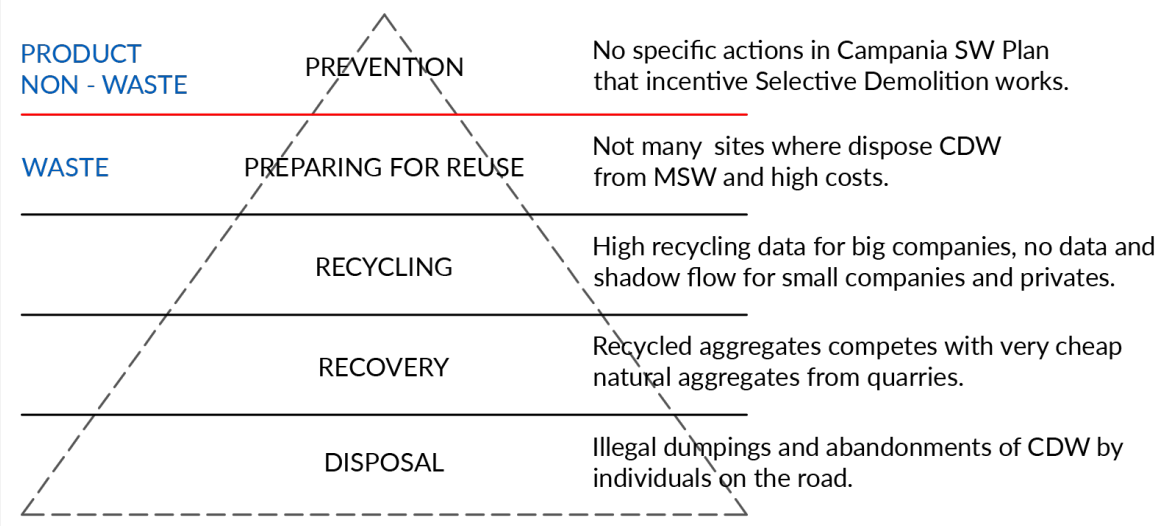

Figure 32. Reverse hierarchy of the current situation of CDWs in Italy and main problems in Campania. Elaboration of the author. Source:: D.5.3, REPAiR, 2018.

The Beyond INERTia strategy has been defined as a set of site specific EISs (REPAiR, 2018) to cope with the current challenges and bottlenecks of the recycling supply chain of CDW. As mentioned in the status quo analysis, the main part of this flow consists of inert waste, considering identified dysfunctions in the local supply chain, the single EISs of this strategy focused on the management of the mixed inert waste fraction. PULLs and scientific research identified the necessity of:

1. free collection points for CDW disposed by little producers;
2. a Regional Concession Fee on quarries of sand and gravel;
3. incentives to companies that make selective demolition;
4. a regional sustainability certification for recycled aggregates from inert waste;
5. the item and price of “recycled aggregates” in tender specifications;
6. recycled aggregates for landscape architecture operations.

These solutions have been technically implemented into the GDSE platform. Each one can have an impact on CDW flows reduction or modification. Using the GDSE, the actors involved in the geodesign process can combine solutions in strategies and select implementation areas.

From the conclusions of the GDSE process, the solutions selected and joined to the alternatives for the regeneration of the waste architecture are deduced. Stakeholder groups that participated in the strategy development process with the GDSE are also considered, as well as indicators of circularity, production of ecosystem services.

The alternatives must be part of a strategy composed of several actions (EISs), which provide a future vision of the area. This does not mean top down planning, rather developing a strategic vision of urban regeneration of an area must be contextualized according to the primary needs of the place, according to the enabling conditions (BA) present.

In this social enabling context some stakeholders took part to Naples PULL of the REPAiR project.

During the PULLs, citizens and local environmental associations highlighted the problem of abandoning of CDW as a widespread local problem in Naples peri-urban area. Anyway, abandoned CDW have not been taken into account in the Material Flow Analysis, because of the lack of necessary geolocalised hard data.

From PULLs emerged that regulatory obstacles to the circular metabolism of CDW are also due to the absence of specific actions for selective demolition in current regional regulation (PRGRS, 2011), whose actualization is ongoing at the date of the present paper); the low cost and high availability of quarry materials; the distrust of construction companies toward recycled products; the absence of recycled

aggregates in regional pricing; poor separation at the source of the waste and use of selective demolition practices (REPAiR, 2018).
By starting from the global and local scenarios and considering the critical issues raised, a set of eco-innovative solutions (EISs) have been proposed, implemented in the GDSE.
The main categories of actors involved in the whole process include the scientific community (higher education, research), industry, NGOs, civil society, general public, political measures, media and investors.
In the first co-exploring phase, the main difficulties and potentials on waste management and wastescapes have been identified through collective discussions, using decision trees and semi-structured interviews (elaborated by Berruti, Guida, and Palestino, 2017) with an open multidimensional and multiscalar approach. Issues emerged in the top four PULLs of co-exploring phase and interviews concern a wide range of issues to the legacy of the waste crisis in Campania. The Municipalities of Naples Focus Area who took part in PULLs were: Frattaminore, Casalnuovo, Caivano, Afragola, Acerra, Casoria, the City of Naples, the Metropolitan City of Naples, the Campania Regional Authority. The waste management companies were SAPNA, ASIA, CEA, Epsilon 2000 Society. Some of the main problems of Campania Region outlined are: waste balls disposal and relative infringement proceeding, lack of cooperation between institutions, popular distrust in local governance and in waste management system, NIMBY effect and difficulties in realizing waste treatment or recycling plants, waste abandonment, proliferation of wastescapes due to social behaviours and to lack of control, underuse of waste facilities in function, lack of interaction between public and private bodies. Wastescapes proliferation emerged as deeply connected to the urban metabolism of waste, not only because of the illicit phenomena of waste management, but also due to the waste management activities in Campania Region. The big amount of waste daily transported in treatment plants outside Campania Region, or abroad, has a huge environmental and economic impact. It is evident that a distance reduction for waste treatment and recycling represents the common goal for both waste flows analysed (organic and construction and demolition waste), as it will consequently close up the recycling circle at a regional scale. Bottlenecks in the recycling and waste supply chains are different according to the waste fraction considered. Regarding CDW, the emerging issues mentioned above were outlined in specific focus groups. A key role was played by the trade associations of Neapolitan builders (ACEN - Associazione Costruttori Edili Napoletani), in whose headquarter the fourth PULL took place, the cadaster of waste of ARPAC and the section of General Management of the Integrated Water and Waste Cycle Office.
The second phase implemented the previous one with the co-design of the eco-innovative solutions EISs. The four PULLs carried out in Afragola (Naples) in 2018 aimed to the regeneration of wastescapes rethought starting from both territorial problems and those related to the dysfunctions of waste management. In this phase, some wastescapes have been mapped in collaboration with NGOs and free citizens, who have played a central role in the knowledge of the territory and less evident issues. In the end of this phase, a set of EISs that proposed the Beyond INERTia strategy have been defined.
In the third phase of PULLs, the verification of the solutions identified for both OW and CDW were analyzed by experts of the waste management sector, public administration and companies. Focus groups and interdisciplinary Knowledge Transfer events with other partners of the REPAiR consortium gave place to this phase. The importance of some EISs has been confirmed, other EISs considered by citizens and associations have been criticized because of their inconsistency with the Italian Law.

Table 13. PULLs carried out in Naples case study from the 2017 to 2019

PULL		PLACE	DATE	PARTICIPATION	CORE ISSUE
CO-EXPLORATION	1	NAPOLI	10/4/17	66%	Kick of PULL
	2	CASORIA	31/05/17	40%	Waste management
	3	CAIVANO	14/09/17	18%	OW
	4	NAPOLI	29/11/17	50%	CDW
CO-DESIGN	5	AFRAGOLA	14/02/18	76%	Wastescapes
	6	AFRAGOLA	07/03/18	96%	Wastescapes
	7	AFRAGOLA	28/03/18	60%	Wastescapes
	8	AFRAGOLA	23/04/18	73%	Wastescapes
CO-PRODUCTION	9	NAPOLI	16/07/18	70%	EISs and strategies
	10	NAPOLI	15/01/19	72%	EISs and strategies
	11	NAPOLI	13/02/19	60%	EISs and strategies
	12	NAPOLI	27/02/19	77%	EISs and strategies
	13	NAPOLI	18/04/19	67%	EISs and strategies
				63%	

It is an ongoing process, monitored in the research by REPAiR team and in different PULLs. Last October 2019, REPAiR team of Naples took part in technical table convening on CDW for the next regional plan for the management of special waste (PRGRS – Piano Regionale per la Gestione dei Rifiuti Speciali in Campania), for the Scoping phase, together with ACEN and other actors involved. GDSE has been proposed as a tool for co-exploring and co-design plan strategies, but using it on a regional scale results in some obstacles yet to be solved. Due to the diversity of the six European cities, the absence of wastescape criteria and indicators made not map them according same indicators and, then, it is not implemented in the GDSE to compare the peri-urban wastescape mapped.

Photo 5. Peri-Urban Living Labs in Afragola, identification of wasted areas. REPAiR, Feb 2018. Photos of the author.

Stakeholders involved in CDW analysis and solutions include different actors from Scientific Community, Industry, Trade Associations, Civil Society/General Public, Policy Makers (Campania Regional Authority, in particular with the section of General Management of the Integrated Water and Waste Cycle Office, and some private Investors.

4.3 The Geodesign Decision Support Environment – Opportunities and limitations in Campania Region (and in Italy)

The Geodesign Decision Support Environment (GDSE) is geodesign-based open source platform that support a decision making process to develop circular economy strategies in a territorial context. It has been developed in the REPAiR project (GDSE, 2020; REPAiR, 2019; Arciniegas et al. 2019). It is structured in five phases.

The first, the Study Area

The second, the Status Quo section, let stakeholders know data on the urban metabolism of the waste and/or resource streams of interest. The spatial diagrams of these flows show exactly where the producers and receivers of the flows are located. The route taken by the mapped waste material is not identified as an infrastructure route, as this information requires further detailed investigation. In Naples case, the waste data included were provided by the ARPAC Waste Register and give a partial but detailed picture of the major CD waste streams. In order to elaborate eco-innovative solutions for the management of waste from the built environment, it is necessary to analyse which are the main waste streams and which are the stakeholders linked to their management, i.e. the companies that produce and those that manage recycling or disposal. The GDSE allows an interactive and spatialised visualisation of waste streams, mapped from data provided by MUD declarations (source: ARPAC, MUD data, 2016).

Mapping method and type of data input: As MUD declarations are not mandatory for a large share of companies, small operators and manufacturers (MUD exempt reference), the databases do not contain all the punctual information needed to carry out an exhaustive mapping of all waste streams crossing the territory. For example, CDW produced by small renovations are not tracked, but the databases of the waste register show the total amount of waste managed by a treatment company. The data included in this GDSE simulation for the Naples case study are therefore accurate but partial, but they provide a framework for the elaboration of strategies at inter-municipal scale. This Activity-Based Material Flow Analysis (AB-MFA) is hierarchized on the economic activity categories of the actors involved, analysing the type of waste and the quantity.

Starting from this basic scenario, at an inter-municipal scale, it is possible to explore hypotheses and elaborate eco-innovative strategies both in the definition of industrial synergy management policies at a regional, provincial or municipal scale, and in the elaboration of collaborative short supply chain projects. The actors mapped as flow nodes (Figure y) are both producing and receiving companies.

In the GDSE, the relationship of metabolic fluxes with the territory has been set up but not operationalised in decision-making and impact assessment.

Innovation of the project in the context of urban metabolism studies, the identified resource flows were mapped in detail.

Evaluation processes are a decision-support tool for sustainable and regenerative design and planning that set specific objectives for urban regeneration (multidimensional environmental, economic and social). Specific objectives must be clarified as measurable and assessable goals. Benchmarks used by a planning team guide the design of projects at the drafting stage and likewise can guide ongoing monitoring to guide changes made necessary by unforeseen events to achieve certain objectives.

Considering the complexity of any urban regeneration project, even on a small scale, the definition of indicators for evaluation helps to guide the cognitive, creative, design and production process.

In the combination of the multiple objectives of sustainability, urban regeneration and the implementation of circular economy solutions, urban and architectural projects take on an increasing level of complexity. Urban metabolism is governed by industrial processes, powered by energy sources that can be renewable, non-renewable or renewed (such as biogas, i.e. produced by recycling and/or recovery operations).

Technological solutions for sustainability must be combined with architectural and urban regeneration solutions, not only as an adjunct and accessory element, but in an integrated way, consistent with site-specific needs and possibilities.
Urban regeneration of a suburban waste area can be much more complex than just regenerating a contaminated land, or a brownfield far from inhabited areas. Where environmental problems are combined with socio-economic ones, one has to deal with citizens, inhabitants, communities of place, who constitute the most alive and fragile part of an urban wastescape.

4.3.1 The Activity-based Spatial Material Flow Analysis

The waste flow maps are one of the innovations offered by the GDSE platform. Spatializing the metabolic flows open the box of urban metabolism and let actors go beyond aggregated quantitative data. These maps allow decision-makers to have a real knowledge about who are the main stakeholders to consider in a decision-making process and how resources move on the territory.
In the status quo section of the GDSE the dynamic evaluation maps of waste flows let visualize the current scenario of the supply chains (Arciniegas et al., 2019).
In the Activity-Based Material Flow Analysis (AB-MFA) data describe: origin and destinations of each stream, that correspond to companies in the case of CDW, and to the quality and amount of that. The actors have been classified according to their Nomenclature of Economic Activities (NACE) code, that is the European statistical classification of economic activities (EUROSTAT). NACE code classifies hierarchically Activity Groups, Activities and Actors. In this way, each company is clustered in its group of similar activities. These clusters can support analysis by layers. Regional solutions to improve local waste metabolism can be genetically tested on cluster groups, and not only on some actors.
Waste flows are classified according to the European Waste Catalogue (EWC) codes (EC, 2000 Commission Decision 2000/532/EC). In Italy, the homologous classification of economic activities ATECO (ECOnomical Activities) is a type of classification adopted by the Italian National Statistical Institute (ISTAT) for national economic statistical surveys. Households were classified through an ad-hoc invented code V-000. Italian general data on waste management in the last five years (tables from ISPRA). In Naples case study, the data collection for the AB-MFA has been carried out with the support of the Campania regional environmental protection agency ARPAC (Agenzia regionale per la protezione ambientale - Regional Environmental Protection Agency) and the Chamber of Commerce. Waste flows are tracked and checked by the waste register of ARPAC, from unique environmental model (MUD) declarations. Data have been elaborated and implemented for organic waste fraction produced by households and companies and for CDW flows (MUD, 2015). The maps produced with such data are in the Status Quo section of GDSE process. Specific views are prepared before the GDSE/PULLs workshops, by organizing in layers the sub-fraction of each flow, according to the criteria suitable to support the GDSE workshop session. Flow maps and Sankey diagram offer multiple information: knowing the existing scenario of waste metabolism, analyzing the main clusters of related activities, understanding at a glance the main activities and actors involved in the management of a key flow From a first analysis, some strategic actors can be involved in the decision-making process in a GDSE session to test regional policies or implementing ideas in new eco-innovative strategies.

4.3.2 GDSE digital workshop

The REPAiR GDSE workshops with local stakeholder of waste management sector were scheduled in the Naples case for spring 2020, but the COVID-19 pandemic prevented the in-person activity from taking place. The software had been shown to public stakeholders and researchers involved in the REPAiR research in February 2019, but use was limited to the Study Area and Status Quo part, because the Solutions had not yet been modelled within the software.

The GDSE workshop in the PULL on line in Naples on 25 June 2020 following the structure with some videos of support /revealed that at a distance the process allows more actors to be involved, but presents several pros and cons technicians.

Table 14. Pros and cons of a digital GDSE PULL workshop.

	Pros	**Cons**
Participation	The workshop can also be followed by distant stakeholders	The workshop is limited to those who own a computer; the Zoom meeting needs technical assistance for participants; Participants need to know how to use software and digital platforms
Communication	We talk one at a time and everyone hears the interventions of others	Slowdowns or the fall of the Wi-Fi network can be a problem;
Collaboration	Participants in meetings sometimes speak with less inhibition.	Communication is slower, if participants do not already know each other they have no way of making contact useful for decision-making
Action		Only one person can be pen holder
Use of software	If participants download the GDSE they can also use it themselves and understand well how it works	If participants do not download the software they take part in the process as participants rather than as collaborators

Each group elected a pen holder who acted like a mediator and could select the EISs of the *Strategies*. Even the discussion is made less fluid by the mediation of the screen, but the mediator.
In the GDSE online workshop of MAN the actors and stakeholders were not prepared for the case study of Naples and did not know the challenges of the territory. It seems to be important a pre-workshop training participants for several reasons:

- know the workflow of the GDSE;
- be familiar with the possibilities offered by the instruments;
- understand how resources have been mapped;
- to know (or develop) the EISs together;
- to consider the final objectives of the decision-making process.

Having these points clear the decision-making can take place in a few hours supported by the GDSE. In a real decision-making process, however, it is very likely that more than one iteration will be needed to arrive at a strategic resource management choice.
In a real decision-making process, with actors who already have even partial knowledge of the topics the reasoning on the EISs to use and in which areas used can be simpler.
In the months of the last year we have experienced, unfortunately, a digital transition of all work activities that can be carried out at a distance. Despite the difficulties that can be overcome by improving the management of pre-workshops and the workshop itself, the GDSE can function as a tool to support collaborative decisions remotely.
The GDSE provides the tools to assess the current scenario of waste landscapes through maps presented in the study area phase. The workflow on metabolic flows leads to consider some EISs in a set of possible actions. The selection of some EISs and the selection of implementation areas leads to the realisation of circular economy strategies located in specific territories. In the conclusions of the geodesign process, the comparison of the choices of the groups of actors that took part in the decision-making process constitutes the basis for discussion and negotiation to reach the final decisions.
In continuity with the work developed in the REPAiR project, it is relevant to integrate an evaluation of the results of the GDSE process by setting up some significant spatial indicators of the territories considered.
The wastescapes are mapped according to discomfort indicators that express ecosystem failures.
On a small and medium scale, the wastescape is strongly connoted by qualitative characteristics linked to the perception of environmental and urban aesthetics, which determines a condition that can be independent of the objective environmental performance of the place. In a spatial analysis at a larger

scale, the socio-economic and environmental performance of an area appears relevant in relation to the wastescape phenomena. According to the prevailing land use function, the ecosystem services and disservices of that area can be assessed. In a built environment, as we saw in chapter 3, urban ecosystem services, i.e. environmental and urban services, contribute in a systemic way to determine the liveability of the area.

4.4 A focus on waste and art practice: Art resistance in the Land of Fire

Art plays different roles in contemporary society. It is a sensor, an end, a tool. Waste is a matter of contemporary art. In the 20th century, artists have observed waste with different eyes before scientists, removing it from its condition and transforming it into artworks. A curatorial research on the subject was developed and Lea Vergine, in 1999 (Vergine, 2007). The Rauschenberg Gluts are ready made sculptures or composed of scrap and assembled waste. Similarly, wasted buildings destined to demolition are the object of Gordon Matta Clarke works. Cutting buildings he established a relationship with the surrounding area and new shapes and lights between interiors and exterior urban landscapes. Matta Clarke's cut buildings becomes temporary works of art.

Art works and performances are also tools to make awareness, express disagreement or denounce. A big referent in this deep ecology approach is the work of Joseph Beuys. His happenings, sculptures and performances created forms of awareness toward nature and communities, shaping *social sculpture* (Stachelhaus, 2012).

In the Naples case study, some socio-environmental conflicts arose as expressions of disagreements for the waste crisis management in the Campania Region (De Rosa, 2018; Martone, 2016), in the *Land of Fires* (Figure 33)[1]. Many groups and citizens used art and creativity to express their dissent against the environmental crisis.

[1] This Chapter is based on the paper: Mazzarella, C., & Cerreta, M. (2019). Movilización artística en conflictos socioambientales. *Ecología Política*, (57), 73-80.

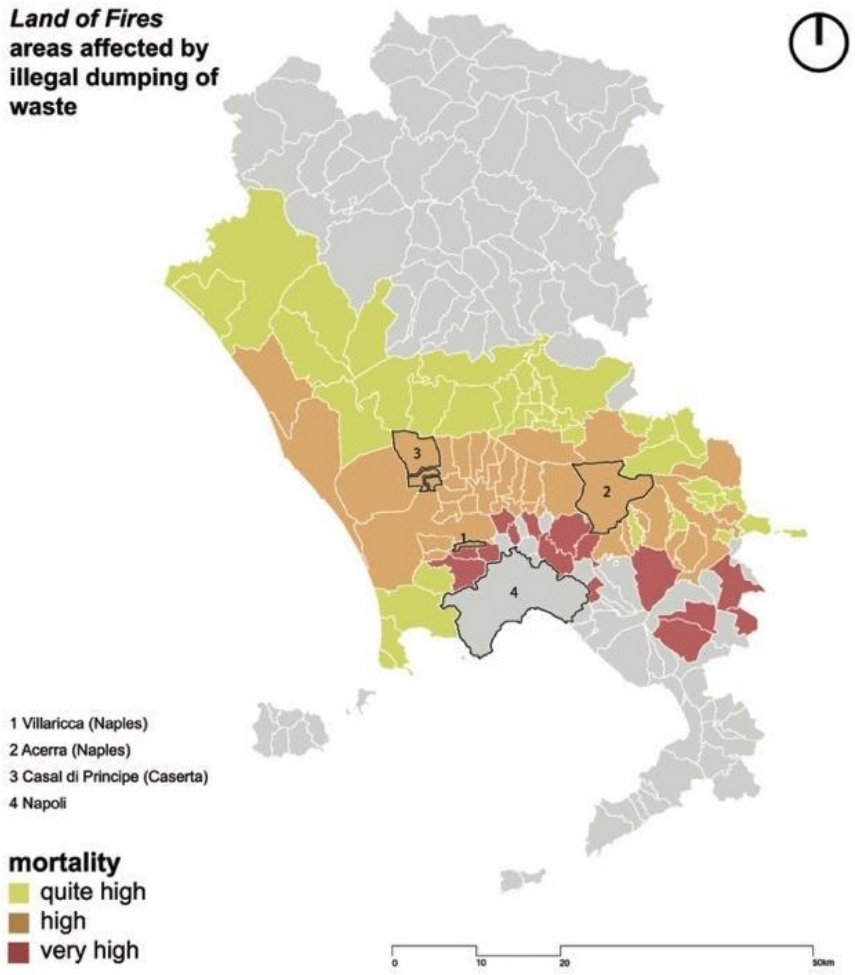

Figure 33. Map of Naples and Caserta Land of Fires Municipalities affected by illegal waste dumping and the mortality level. (Source: Own elaboration adapted from ISS).

A review show several artists, citizens and groups who protested against the environmental crisis and the impacts on human health (Table 15) using literature, music, cinema, and visual arts. In the group of denounces and outreach messages against illicit waste management that have been identified, a category is significant: those practices that have created an alternative and innovative social cooperation initiative, in addition to outreach and protest are very interesting in the context of wastescape regeneration. They are the 1) the *Bidonvillarik Orchestra*, 2) the *Living Biodiversity Museum*, 3) the *Let's turn on the hope* event and 4) *La Luna* theatre workshop. They can be considered art Collective Actions, in the path of Beuys's *social sculptures*. Along the last 15 years of his work, Joseph Beuys developed the project *Difesa della Natura* in Italy, also spending some time in Naples, extending the concept of sculptural work to human society playing an artistic, political, ecological and humanitarian action. In Beuys philosophy, the social sculpture concept is based on inclusive and free cooperation and communication between persons from different cultures, backgrounds, religions or conditions, through the protection of the environment and of the women and men that live in it. *Difesa della Natura* operation has been an action of deep ecology philosophy, boding humans and environment by making community. Along these lines, four practices took place in the Land of Fires, in the Municipalities of Villaricca, Acerra, Casal di Principe and Naples (Figure 33; Figure 34). They have worked creating kind of *social sculptures*, making social innovation actions to face the environmental crisis.

Bidonvillarik play objects, waste and anything that can be reused. Each year the band renovate the members and over time they achieved fame and interest from media, like BBC. A further version Bidonvillarik Vegetables Orchestra plays watermelons, pumpkins and various fruits and vegetables, that

after each show they share and cook. The original idea was of Marenia, the founders of musical association Illimitarte, promoting music and the idea of freedom.
The Living Museum of Biodiversity has been activated in “Antonio Esposito Ferraioli” AEF Farm, a property confiscated to Camorra in Afragola. It is the biggest MAN confiscated asset, extending for twelve hectares. From 2017 this good has been granted to a network of associations: “Terzo Settore”, a consortium of social cooperatives, to “Giancarlo Siani” social cooperative, and "Sott'e'ncoppa" voluntary association. The Living Museum of Biodiversity was born in March 2018 and it is hosting almost two thousand trees of different native species of Campania Region. The first work of planting was destroyed by a criminal intimidating attack, but the farm community promptly reacted re-planting all the destroyed trees. AEF Farm promoted this action to highlight the cultural and historical value of autochthonous vegetation, that is threatened by pollution and urban sprawl.
Let’s turn on the hope event was promoted by the artist Giovanni Pirozzi, with the associations “Work in progress” and “Albanova Bene Comune - ABC” of San Cipriano di Aversa, that took place for three days on October 2013 in San Cipriano di Aversa, Casal di Principe e Casapesenna (Caserta). In those days the streets of the municipalities involved were populated by mannequins made of transparent plastic bottles, each one hosting black cancers, to denounce the high health risk the population was exposed to. Together with this installation, a convention was organized to talk about waste and cancer, and a live music festival with famous bands, and entertaining activities for children.
La Luna theatre lab, directed by Davide Iodice and promoted by Teatri Associati di Napoli took place during Napoli Teatro Festival Italia 2018 and, again, in 2019. It collected personal waste objects to create a “warehouse of humanity”, eventually used in the creative workshop process and play, with 25 actors selected by a public call. The main idea was to root around the psychological garbage of a community, to derive an idea of the world and its society, to understand a sense that seems lost, own and public meaning. “La Luna” is the ideal third stage of Davide Iodice research on the crisis of our time.

Figure 34. The groups and events of art resistance in the waste crisis. (Sources: Bidonvillarik - Industria Percussiva Riciclante webpage, AEF Farm web page, pupia TV, NTFI web page).

Table 15. A chronological review of artistic dissent actions in Campania 'Land of Fires'. Elaboration of the author.

N.	TITLE	ARTISTS / PROMOTERS	PLACE	YEAR	DURATION	ART	TYPE OF EVENT	TOPIC	RESULTS
1	Bidonvillarik – Industria percussive riciclante	Illimitarte - Cultural and musical association	Villaricca (Na)	2006	Ongoing	Music	Open orchestra	Make music with waste	Social aggregation and cultural sharing
2	Biutiful Cauntry	Esmeralda Calabria, Andrea D'Ambrosio	Naples / Caserta	2007	/	Film	Documentary	*Campania Felix* havoc	Outreach on illegal phenomena and health damage
3	Postcards of the released garden gnome in the land of fire	Mauro Pagnano	Orta di Atella, Caivano, Casoria/ Afragola border; Terzigno S.Giuseppe Vesuviano Chiaiano, Taverna del Re-Confine Giugliano- Villaricc, Acerra Incineritor (Na)	2012	8 performances	Installation & Photography	Visits of a gnome in toxic illegal dumping	Part of "Garden gnomes liberation front"	Outreach on illegal waste disposals in Campania
4	"Let's turn on the Hope" event	Promoted by the Associations "Work in progress" and "ABC – Abanova Bene Comune"	San Cipriano D'Aversa, Casal di Principe e Casapesenna	2013	/	Sculpture	Installation of 150 mannequins made of plastic bottles	High number of deceases due to cancer	Outreach on health risks
5	Terra dei fuochi e sole...(fuoco fumm cenere e pizza)	Raffaele Bova	Museo d'Arte Contemporanea della Città di Caserta	2014	28 February to 21 March	Visual Art	Exhibition	Waste fires and waste dumping	Outreach on the subject
6	'A Guerra d'Acerra	Peppe Ruotolo	Acerra (Napoli)	2014	/	Music and poetry	Song	Acerra pollution	Outreach on illegal phenomena and health damage
7	Pulcinella and Zampalesta in the Land of Fires	Teatro della Maruca - Gaspare Nasuto e Angelo Gallo	Acerra (Na)	2015	Spot events	Theater	Puppet show	Illegal hazardous waste disposal in south of Italy fields	Spread of the topic
8	Terra dei fuochi e sole...(fuoco fumm cenere e pizza)	Raffaele Bova	ArtSTUDIO Gallery - Benevento	2015	24 April to 12 May	Visual Art and Performance	Exhibition Opera Collettiva DISCARICA	Waste fires and waste dumping	Outreach on the subject
9	Bella e dannata	Pietro Marcello	Carditello Place and surrounding countryside (Caserta)	2015	/	Film	Docufilm	Poetic documentary of *Campania Felix* havoc	Love for nature, heritage and animals
10	Abbi pietà di noi	Enzo Avitabile	Naples	2016	/	Music and poetry	Song of "Lotto infinito" disk	Prayer about pollution in Land of Fires.	Outreach on illegal phenomena and health damage
11	Immondezza - La bellezza salverà il mondo	Mimmo Calopresti	South of Italy	2017	/	Film	Docufilm	Travel through landscapes, cleaning beaches from waste.	Outreach landscape and *wastescapes.*
12	Tutte le promesse: una storia apocrifa	Author: Raffaele Mozzillo. Editor: Effequ	"Land of Fires" suburbs	2017		Literature	Book	Life in peri urban areas in abandoned sites	Outreach on social problems in abandoned sites
13	From Land of Fires to Land of Flowers	Sasha Vinci, MariaGrazia Galesi – promoted by "Reggia di Caserta" with the Gallery A29 Project Room of Gerardo Giurin Milano | Caserta	Installations in Photographies exposed at Reggia di Caserta.	2017	-	Sculture	Exhibition	Investigate identity factors through forgotten places and abandone and neglect sites	Outreach on the subject
14	La Luna	Director: Davide Iodice. Promoted by Teatri Associati di Napoli	Teatro Nuovo (Napoli)	2018	Ongoing	Theater	Workshop recollecting and interpreting waste of a community	Conceptual work on waste, as the refuse of a community	Art research on the concept of waste
15	Biodiversity Living Museum	Antonio Esposito Ferraioli (AEF) Farm	Masseria Ferraioli - Acerra (Na)	2018	Ongoing	Open-air Museum	Garden of biodiversity as open collective project	Plantation of thousands of trees of different species of Campania Region	Social aggregation and cultural sharing of a garden and environmental remediation
16	Terra Felix	Author: C. Perugia, D&P Editori	-	2018	-	Poetry	Book	*Campania Felix* havoc	Outreach on the subject
17	Terra Mala. Living with poison	Artist: Stefano Schirato Promoter: GUNA	Milano	2018	October – December 2018	Photography	Exhibition	Environmental disaster of last 30 years	Outreach on the environmental disaster

Thus, if we consider social sculptures in the modern concept of social innovation, we can evaluate the effects of these actions in their context from a social perspective. EU defines social innovations as "new

ideas that meet social needs, create social relationships and form new collaborations. These innovations can be products, services or models addressing unmet needs more effectively" (BEPA, 2011; 2014). In this framework, the approach elaborated by the Regional Social Innovation Index (RESINDEX) project (Table 16) can be used to evaluate social innovation of the selected collective art actions. RESINDEX is a model to evaluate social innovation capacity (Unceta et al., 2016).

Table 16. Realized Capacity and Social innovation indicators.
Source: RESINDEX model (RESINDEX, 2013. pag.17). Adapted by the author.

Potential Capacity	**Realized Capacity**	
Capacity For Social Innovation	**Social Orientation Index**	**Social Innovation Index**
Capacity for knowledge	Knowledge acquisition	Knowledge acquisition
Capacity for learning	Development of social projects	Development of innovative social projects
Capacity for socialization	Impact of social projects	Impact of innovative social projects
Capacity for development	Governance	Governance
Capacity for association		

From this framework, the RESINDEX clusters and sets of indicators have been adapted to the case studies. The evaluation considers the potential capacity and the realized capacity of social innovation of each art action, according to the concepts of knowledge, communities, autopoiesis and diffusion (Table 17).

Table 17. Art actions in Land of Fires ex-post evaluation framework: clusters and indicators.

Cluster	**Indicators**	**Description**
Potential capacity	Capacity for sharing knowledge	The capacity of outreach, raise awareness and sharing knowledge
	Capacity for making the community	The capacity of making inclusive and cohesive communities through activists and existent associations, committees, etc.
	Autopoietic capacity	The capacity for creating self-sustainable conditions
	Diffusion capacity	Spreading and growing capacity
Realized capacity	Knowledge sharing and acquisition	Realized knowledge sharing and acquisition
	Development of innovative social projects	Realized Capacity of Innovative social art projects
	Creation of community	Creation of an inclusive and cohesive community
	Autopoiesis of the process	Self-sustainability for durability of the innovative process
	Diffusion reached	Echo and spread of the project

The selected art practices, conceived as alternatives, are assessed implementing 'Preference Ranking Organization METHod for Enriched Evaluation (PROMETHEE) (Brans and Mareschal, 1994). It is an outranking method that provides a ranking of actions (choices or alternatives) based on preference degrees. We have used a qualitative scale of judgments taking into account the criteria and indicators

able to describe their "Potential capacity" and the "Realized capacity". The results of the ex-post evaluation process are set out in the following graphs (Figure 35).

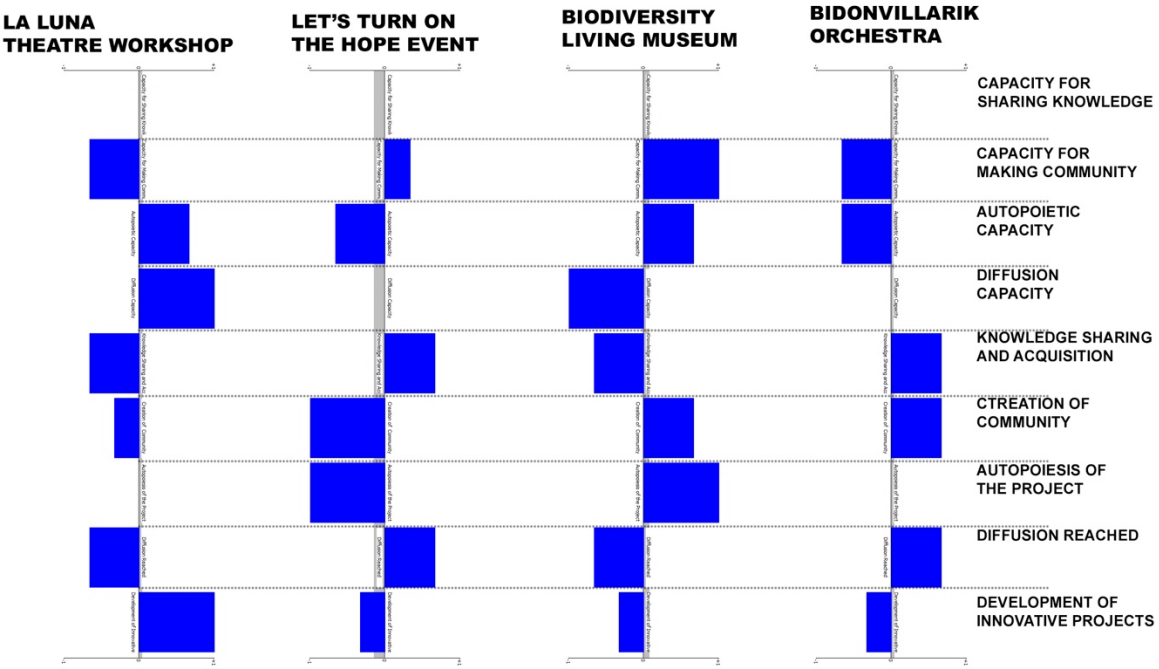

Figure 35. Potential and realized capacity in art practices in the Land of Fire. PROMETHEE evaluation.

The profile of each practice identifies how they are able to express the "Potential capacity" and the "Realized capacity", underlying the variety of performances and the relevant results related above all to the capacity of involving the local community.

Taking into account the representation of the Gaia Plan, it is possible to identify the indicators that influence the innovation capacity of each practice, connected to the capacity for making a community, and to the autopoiesis of the project and the capacity to develop innovative social practices.

Four different art practices in Campania Land of Fires, born in reaction to the waste crisis that has never really ended, have been presented. We have shown how people and grassroots movements are daily working, not only fighting for their rights, but building living alternatives to face the serious problems, resulting from waste crisis legacy, with big efforts, using art for a resilient approach too. The four art practices analysed have demonstrated how each accomplishment can be important to realize social innovation. The different results are complementing each other, and are able to promote synergistic processes together with a new, more active, knowledge of the problematic issues. In conclusion, we consider that great positive efforts are in progress, but that there is a lack of network between these grassroots art actions.

Figure 36. GAIA plan. Evaluation of art practices in the Land of Fire

The selected case studies demonstrate the value of collective bottom-up actions to activate environmental awareness and consciousness on issues of public interest. Artistic practices as a means of denunciation have great communication power, and the capacity to make social innovation. At the same time, artistic actions that become productive community activities have the autopoietic and regenerative potential to become examples of urban regeneration, and social enabling conditions for wastescape regeneration. Some cases of bottom-up collaborative practices practiced through the tools of art and social sculpture will also be the subject of the following case studies in Part IV.

Conclusions

Section 4 presented methods and tools for wastescape regeneration tested in the h2020 REPAiR project in the Naples case study. It is a significant case of physiological waste systems at intermunicipal scale analysed in a focus area of the Land of Fires in the Metropolitan Area of Naples. The study explored the dynamics of two metabolic flows: of Organic Waste (OW) and Construction and Demolition Waste (CDW) produced by the eleven municipalities of the Naples focus area: Acerra, Afragola, Caivano, Cardito, Casalnuovo di Napoli, Cercola, Crispano, Frattaminore, Naples and Volla. These municipalities are part of a complex and problematic area, where illegal waste management led to strong pollution and serious environmental depletion, with big cases of environmental injustice proven by consequences on people health. In fact, the involvement of local actors in the process showed great sensitivity to the problem of waste management, and in the Living Labs both enthusiasm and scepticism in the institutions.

The REPAiR project developed several analysis and results. This case study present materials and tools that support the collaborative development of looping actions and the decision support system. The two waste flow explored currently constitute an issue, each one for different reason, but they could be a resource for circular economy at local scale and circular city. They are:

- the organic waste (OW) and the construction and demolition waste (CDW) flows, that have been assessed through an Activity-based Spatial Material Flow Analysis (AS-MFA);
- the GDSE software to support decision making processes in waste management, a collaborative geodesign-based platform the Geodesign Decision Support Environment (GDSE), that can be an opportunity for the elaboration of future Regional Waste Management Plans, but has also some limitations. If policies aim at implementing local looping actions for the waste flows;
- a focus on some cases of bottom-up artistic contestation in response to the waste crisis in the Land of Fire, evaluated with the Promethee method considering their capacity to produce social innovation, and therefore social enabling conditions for wastescape regeneration.

The AS-MFA mapped companies, clustered in their economic activity categories, and their flows classified per type and amount per year.

The looping actions of the circular economy on a local scale are of great importance. Circular value chains produce great socio-economic, new jobs, and environmental benefits by reducing on the one hand the environmental impacts of out-of-region waste management and on the other hand the demand for incoming raw material flows of the circular city.

The GDSE supports the development of strategies for looping metabolic flows through a multi-actor process.

The online workshops made clear the need to structure the collaborative planning of circular economy strategies at this scale through the definition of a group of expert stakeholders together with non-experts, and to jointly develop the steps for preparing the content of the GDSE.

The waste produced by an area is an available resource that needs to be known and assessed in order to make the circular economy. Mapping is the necessary basis for knowing and analysing the resources. The GDSE decision support system is a tool to manage metabolic resources by planning circular economy policies with respect to the territory.

This problem could be addressed by involving local actors in strategic planning, by systemizing the theme of environmental regeneration with that of looping actions for the circular economy, as in the integrated strategies of the REPAiR Naples project (Garzilli, Mazzarella & Vittiglio, 2019). In the GDSE, strategies to make circular economy are based exclusively on economic activities and industrial synergy operations. The waste area maps (wastescapes) do not interact with the waste metabolism maps as no applicable wastescapes indicators were identified for all six case studies.

The absence of common criteria and indicators in the wastescapes mapped is a cause of the impossibility of assessing spatial maps (of wastescapes) with Material Flow Analysis maps (of urban metabolism) systemically in the GDSE. The spatial analysis and metabolic resource management in the GDSE is just presented in the first steps of the knowledge phase. The absence of a standard and comparable criteria and indicators has made it impossible to assess the territory's performance according to changes in metabolic flows.
However, the research explored the identification of wastescapes and the elaboration of solutions and strategies in a multi-stakeholder decision-making context of Living Labs. The logic of the circular economy applied to waste and resource management was also applied to the study on wastescape regeneration.
Overlapping maps of the CDW map of the AS-MFA and some unfinished buildings mapped in the REPAiR focus areas (Figure 37), the physiological and morphological components of wastescapes are represented together, and are a basis for a joint analysis. Unfinished buildings can be material stock or future construction site to be completed.

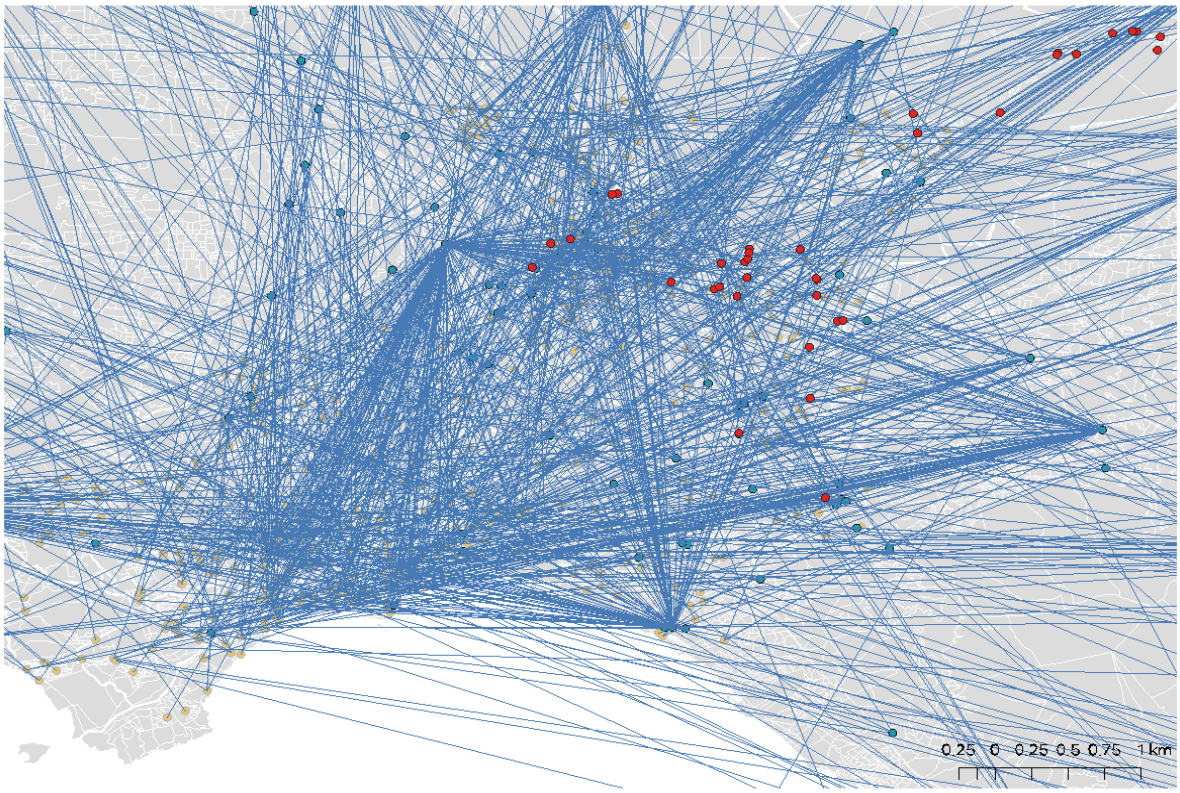

Figure 37. CDW flow map and unfinished buildings in the Naples focus area. Elaboration of the author.

The yellow dots on the map are CDW producers. Blue ones are management companies. Red dots are come unfinished buildings mapped in the Naples focus area (Salzano, 2018). CDW waste management solutions and adaptive reuse solutions of unfinished buildings on the territory of the focus area, can take place contextually by providing. Through an approach that starts from materials management or with an approach that starts from the completion or renovation programme and adaptive reuse of the abandoned building. Starting from research on the circular city and urban metabolism, a set of indicators is proposed.

Table 18. Indicators for assessing circularity of metabolism and buildings in the circular city context.

Dimension	Indicator	Unit of Misure	Positive direction
Circular Metabolism	Waste flow amount	t/y	Max
	Virgin materials avoided	t/y	Max
	Recycling facilities in the area	N.	Max
	Recycled and recyclable materials used	t/y	Max
	Incoming material flows	%	min
	Outgoing material flows	%	min
	Material wasted per inhabitant	t/y	min
	Amount of financial support to implement nature-based solutions	€/year	Max.
Circular buildings	Number of building reused for a new function	N.	Max
	Number of spaces reused with a new function	N.	Max
	Number of projects including nature-based solutions	N./tot projects	Max
	Recovering of abandoned areas	Sqm recovered/sqm abandoned	Max
	Adoption of green and blue infrastructure which can help to regulate CO2 emissions, flooding and the heat island effect	N./area	Max.
	Number of retrofitting projects	N./year	Max
	Energy savings from reduced building energy consumption	CO2/year	min
	Distribution of public green space	Sqm/inhabitant	Max
	Distribution of collective space	Sqm/inhabitant	Max
	Presence of waste collection points in the building	Yes/No	Yes
	Recovery of grey waters	Yes/No	Yes
	Production of natural food	Yes/No	Yes
	Production of environmental benefits	Preference	Yes

The approach to the management of metabolic flows in space paves the way for a new way of collaborative planning for the circular city. In fact, small-scale waste material recovery actions have a predominantly social and cultural value: they produce community aggregation and raise awareness of environmental issues. If these solutions were spread extremely widely, they could have an impact on the overall metabolic balance. On a regional scale, however, the circular economy is achieved through strategic choices and specific actions for waste management: on this scale, the difficulty in Campania seems to be the construction of treatment and recycling plants, or - in the case of organic waste - biogas and compost plants as alternatives to landfills and incinerators. Due to popular distrust, local communities often make great opposition to the construction of plants. On the other hand, many plants

in Campania are underused. In conclusion, European Green Deal states the necessity of a *deeper cooperation across value chains* (EC, 2019). If we think in a systemic design perspective, the two supply chain of the waste flows analysed in this case study, and the original materials they come from, should be analysed systemically. Wastescape can regenerated becoming points of convergence of different value chains.

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PART IV

Bijlmer and Scampia: regeneration processes of two modern wastescape

Introduction

Part IV presents two case studies of wastescapes at the neighbourhood scale. The case studies presented are two suburban areas: the Lot M in Scampia (Naples) and the K-buurt in the Bijlmermeer (Amsterdam). Narrowing down the scale, the focus moves to the spatial and social dimensions of wastescapes.

These two far neighbourhoods have gone through a similar and harsh history over the last 50 years. Wasted architecture and social issues (*wasted lives*) are predominant wastescapes hallmarks of Scampia and Bijlmer. Multiple factors contributed to the condition of exclusion, marginality and neglection that marked the name of these districts.

Naturally, urban metabolic processes are present, but their dysfunctions are not the core of the wastescape condition of these cases. At the neighbourhood scale, the architecture and socio-economic matters appear to be the core of wastescape conditions.

Locally, the morphological and physiological factors of urban landscapes define the genius loci of the area. In this Part IV, therefore, the leap of scale allows entering into concrete issues that determine wastescape generation and their impacts on a neighbourhood and its inhabitants, starting from the architecture role and the *life between buildings*.

Architecture defines the aesthetic identity of urban landscapes. Unfinished, abandoned or closed buildings in a state of disrepair can damage the image and perception of an entire neighbourhood. Abandoned buildings are also places where criminal activities often occur as they are uninhabited or out of control. Since cause and effect feed on each other, perception and objective reality are never completely dissociable, so the image influences people's lives, which determines the events of a place.

Discarded architecture can become an icon and the cause of an urban wastescape: Scampia and Bijlmer are two prime examples. Both neighbourhoods were founded in the second half of the 21st century in response to the demographic increase of their respective cities. The foundation was designed according to the CIAM modern architecture ideas, shaped in high-rise buildings of modern design. The needs and public policies that led to their emergence are similar, like other hallmarks: a brand-new architectural landscape, the lack of services, and a succession of socio-economic severe problems exacerbated over time.

These areas were conceived as residential satellites necessary to contain the demographic increase of the cities but were not made independent and self-sufficient.

The architecture and urban morphological component have determined the first problematic conditions contributing to the wastescape state in both places. For a long time, the place communities who lived in these contexts suffered marginalisation and poverty compared to any other city neighbourhood. The state has been weak or even absent; consequently, the inhabitants of these disadvantaged areas self-organised their daily life, legally and illegally.

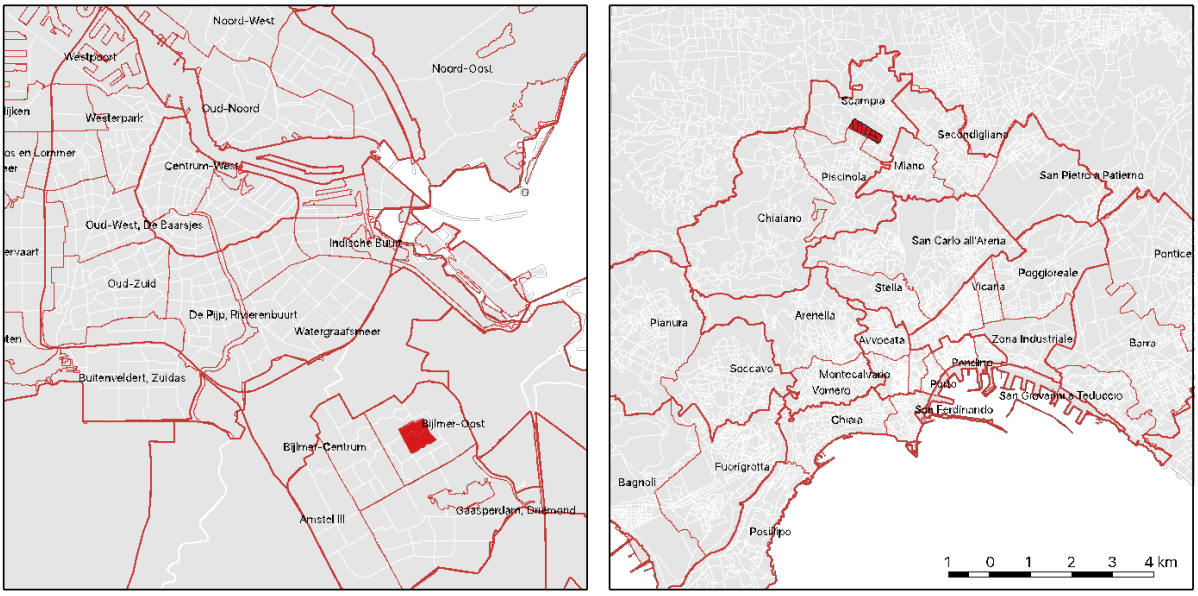
The modern movement's dream of collective living became a daily nightmare for those living in these contexts, and to the outside eye, these urban landscapes became inaccessible wastescapes.

Initially, architecture and urban planning were blamed for the failure of these areas. For this reason, the early stages of the urban regeneration debate turned around transformation alternatives for the built environment. Demolishing and rebuilding the modern buildings and how to replace the failed architecture was a long debate. However, services provisioning was also a key factor, and it is still the key to the problem.

With the time, recognising the architectural and cultural-historical value of modern settlements opened a new phase of debate concerning renovation and preservation versus demolition. In this point, the two case studies present very different bottom-up approaches. In both cases, a strong place attachment linked to identity and memory (Lewica, 2008; Hidalgo & Hernandez, 2001) tells the story of communities that strengthened around their self-organization and response to the waste condition. In both cases, criminal phenomena played a crucial role in the wastescape condition.

In addition to academics and architects interested in the topic, the inhabitants of these neighbourhoods have taken very radical positions regarding the architecture, sometimes opposing, driven by bonds of love or hate towards the place.
For good or bad, modern architectures have become iconic in this urban context. They are landmarks, and the symbolic value of the icon has defined the image of these neighbourhoods.
Communities that have experienced and lived for long periods in such urban contexts tended to establish an emotional bond with the history and the image of the place. This bond is complex. Over the years, the experience they have gone through brings memories of discomfort, poverty, serious difficulties, and conditions from which they sometimes prefer to wipe the slate clean and start again.
The urban regeneration from the stigma developed over time is complex, but it is afoot. In the Bijlmermeer, the regeneration process is already advanced; it is still in the first significant steps in the case of Naples
These cases let go through some wastescape experiences and multidimensional open topics related to regeneration processes that involve architecture and society, i.e. morphological and physiological features:

- The non-material value of architecture and built environment;
- The importance of Urban Landscape Services;
- The role of place communities in urban regeneration;
- The regeneration opportunities in the context of the circular city.



It takes a long time to generate lasting transformations with practical impact. Public policies urban are challenging too. In fact, in neighbourhoods with social inequalities, mistrust in public authority is vital. Any element introduced from outside can be rejected, sometimes destroyed and vandalised.
The regeneration of wastescapes in this kind of urban area is very much about the ability to read, assess, and activate the social and cultural innovation of existing human resources and environmental and material resources. Urban regeneration is capable of turning waste into a resource.
In this perspective, regeneration policies are increasingly opening up to partnerships with local actors.
In both cases, the circular economy strategies would represent significant opportunities for the regeneration of these disadvantaged areas. Inhabitants' life in a neighbourhood determines their vitality.
As stated in the previous sections, circularity can convert waste into wealth opportunities. Urban waste metabolism produces wastescape when it is dysfunctional, but it is a resource for urban regeneration if waste becomes a local resource for economy circular economy activities.

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5 Le Vele di Scampia, Napoli

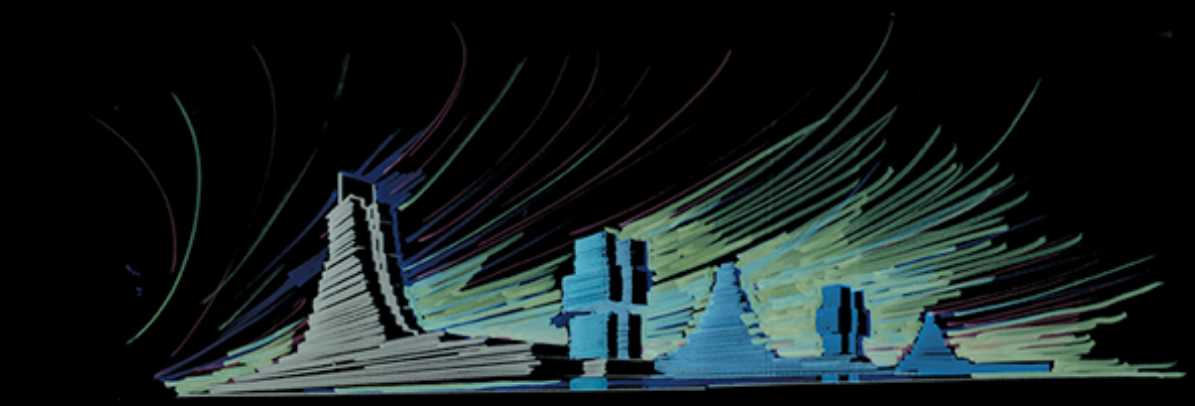


Figure 38. Franz di Salvo's sketch of the Vele buildings.

Le Vele. Cosa sono le Vele? Sono quei grandi teli issati sulle navi che indirizzano i venti in modo che siano favorevoli alla navigazione in mare. Le Vele sono la promessa del viaggio, della forza che si deve catturare per poter navigare. Partendo dal senso vero di questa parola, ho guardato le Vele di Scampia e ho pensato che di sogni, di viaggi di esplorazioni ne regalavano ben pochi. Come se tutte insieme fossero adagiate su una nave che non è mai partita. Una promessa non mantenuta. Le Vele ammainate. […] Le Vele e quindi una nave, una speranza, i marinai che non partendo si abbrutiscono. Già, diventano pirati. […] Dalle prime letture e commenti dei ragazzi del CentroInsieme e di altri amici che abitano alle Vele, so che questa metafora della nave ha fatto centro, perché ha creato un collegamento nuovo, una nuova immagine rispetto a questo territorio e questo contesto. E quando la fantasia si apre al cielo, soffiano venti nuovi nelle teste e nei cuori. Tutto diventa immaginabile e quindi molta speranza diventa possibile.

The Vele (Sails). What are the Vele? They are those large sheets hoisted on ships that direct the winds to be favourable for sailing at sea. Sails are the promise of the voyage, of the strength one must capture to sail. Starting from the true meaning of this word, I looked at the Sails of Scampia and thought that they offered very few dreams, journeys of exploration. As if they were all lying together on a ship that never left. An unfulfilled promise. Sails lowered. [...] Therefore, the sails, a ship, a hope, the sailors who do not set sail and become ugly. Yes, they become pirates. [...] From the first readings and comments of the CentroInsieme boys and other friends who live in the Sails, I know that this metaphor of the ship has hit the mark because it has created a new link, a new image for this territory and this context. And when the imagination opens up to the sky, fresh winds blow in heads and hearts. Everything becomes imaginable, and therefore much hope becomes possible.

(Cerullo, 2016, p 84)

5.1 Introduction

The Vele (Sails) of Scampia are modern residential high-rise buildings, wasted buildings and the wastescape icon of the northern area of Naples. They are landmarks and monuments of the neighbourhood of Scampia.
In this section, the wastescape investigation focuses on the complex scenario of the Vele ongoing transformation. In this case, architecture, public policies and community roles are prominent in the wastescape definition. Urban metabolism of the area is not a crucial point of this case, but it is considered an opportunity for urban regeneration in a circular city model.
The Vele buildings characterize the picture of Scampia. They are tent-shaped buildings, better known as Vele (that means Sails). The wastescape of this neighbourhood called much attention and discussion over time because architecture, modern planning, public policies, and place communities interplayed in the physiological and morphological dynamics of the evolution of this complex scenario.
The degenerative processes that led this area to a condition of exclusion and then to be a *wastescape* are multiple and complex. The first problems arose as soon as the buildings were built: the unfinished condition, the overcrowding (due to the post-earthquake housing emergency of 1980), the isolation from the Naples city centre, the severe lack of work and services for the inhabitants, the inhabitant self-organisation and the Camorra control. All these factors and many more contributed to make this area the fortress of organised crime and the most extensive drug shop in Europe for several decades.
The urban problems of this suburb often have been addressed, starting from the architecture issues. The tent-shaped buildings, by the architect Franz Di Salvo, were designed in the path of CIAM modern ideas to shape the utopia of collective living. They were not completed, the services not realized, and the buildings arose as completely decontextualized in the countryside of Scampia. They failed in the original purpose of becoming social condensers of a new fair and egalitarian lifestyle. The buildings resulted unsuitable for living and were often blamed for being the first cause of the social unease of inhabitants.
While some architects attribute the unfeasibility of the site to the architecture, other architects consider other factors to be the cause of the architectural problems. Mazziotti (2020) identifies overcrowding (the 1,192 dwellings with 6,050 rooms should have been allocated to 6,050 people, following the standard of one inhabitant per room. Instead, there were allocated large families (about 12.000 people), single-class housing (the Vele were conceived solely as council houses). Over time, phenomena of vandalism (theft of lifts and fire-fighting copper spears, unauthorised dwellings with closed porches, verandas and rooms on the terraces, have all been tolerated), and lack of maintenance (the municipality has never carried out ordinary or extraordinary maintenance) spread. To cope with daily problems and to ask for new houses, the *Vele Committee* was born in the first ’80, and it is still the inhabitants' reference point for the struggle for new houses and the demolition of the buildings.
Scampia has been increasingly at the centre of media attention.
Recently, Cerullo and Wilschut narrated the area of Vele as *a Ship's sails* (Cerullo, 2016; Wilschut, 2020, 00:43:00). The image of the buildings symbolised the problematic social situation, which is similar also in other social housing of the neighbourhood of Scampia. The first phase of demolition of the Vele happened between 1998 and 2003. Some transformations have taken place, and others are underway in Lot L and M. In the last twenty years, a gradual process of urban regeneration has been underway. Alongside the bottom-up work carried out by NGOs and virtuous part of the local community, organised in committees, associations and groups of different natures and cultures, the work of the Naples City Council has given a solid push for the implementation of new facilities in the neighbourhood from 2015. Strategically, the Restart Scampia project aims at transforming the neighbourhood into a new centrality in the metropolitan area.

All the Vele buildings will be demolished, but one: the Vela B. It will be reused and regenerated, becoming a monument. According to the Restart Scampia project, the strategy is to build new social housing buildings for residents in the Lot M and to reuse the Vela B as public offices.
In the Scampia case study, the wastescape is a product social and architecture waste systems. The perception and rejection of architecture and social segregation produced and feed the condition of waste.
The wastescape study of this case follows the Netzstadt approach. In Chapter 5.3, the built environment morphology and its transformation present some morphological issues. Potentialities and limitations of lot M's public space and architectures are compared with the intervention carried out in lot L, where an urban regeneration intervention replacing the Sails has already been implemented. The failure of the Modern Movement utopia has been at the centre of a long and heated architectural debate about restoration or demolition, briefly presented in Paragraph 5.3.2. Material and immaterial values are connected to buildings.
The physiological features of the Vele area are explored in Chapter 5.4, going into the role of place communities and their practices in urban regeneration. A collaborative decision-making process is already underway between the Municipality, the Federico II University and the Comitato Vele. In addition to new social housing for the inhabitants, the issue of public space and the reuse of Vela B still seems to be an open question.
Studying the case, the considerable importance of the Vele for the inhabitants emerged, both for those who reject and those who love them. In Scampia, human resources are the main potential and the main challenge of the co-creation process of neighbourhood regeneration.
Thus, the issue of the future reuse of Vela B and the public space seems the most crucial topic for the future of this wastescape regeneration. The lot M transformation alternatives are structured as results of a more open decision-making process in Chapter 5.5. The new identity for the area and the Vela B could make this monument a tangible symbol of collective urban regeneration and social inclusion through a multi-actor approach. The decision-making process should also consider multiple criteria in the perspective of circularity.
In this case, circularity implementation is primarily about the long term sustainability of the transformation.
Thus, going down from the inter-municipal scale of the REPAiR case to the small scale of lot M where the Vele demolition process is taking place, the opportunities of circularity are different and complementary to the strategies proposed by the REPAiR case. Some EISs are proposed as actions to be realized in lot M. Also, the transformation and redevelopment of the demolition of Vela A cope with the problem of CDW management.
Considering the material and immaterial values of the Vele regeneration, the phases to come can widen the active social involvement in the decision-making process, with different subjects and stakeholders living and frequenting the neighbourhood.
Therefore, the Vele of Scampia is a suburban wastescape case study, explored by its mentioned waste systems and its values using the approaches and tools identified for a fair and circular urban regeneration process.

Photo 6. Naples, Scampia neighbourhood. 2009. Photo: Salvatore Esposito/Contrasto.

5.2 Methodology

The study of this emblematic wastescape was carried out considering the regeneration afoot. The methodology is articulated in phases of direct and indirect knowledge to understand both space and architecture uses of the Vele in the Lot M of Scampia and get the social dynamics in the area's ongoing regeneration and transformation process. The analysis went through literature review, interviews, surveys and field visits. Multiple criteria and multi-group analysis are applied for the open issue of the reuse of Lot M and the Vela B.

The Vele are not easily accessible. The context is complex and can barely be understood in short research. Statistical socioeconomic data describe just a part of the complexity of the neighbourhood.

Visiting the site as much as possible appeared necessary to go beyond the image and the typical narrative.

On the 20th of February 2020, the first visit on site documented the demolition start of the Vela A. A couple of weeks later, the researcher matched the first lockdown restrictions due to the COVID-19 pandemic. Consequently, the first interviews were carried out by phone. Following some social media groups and people on social daily let see and read much informal information. A survey on the neighbourhood and the Vele area was spread through social media. The field visits in the Vela D happened in Summer 2020, with couriers who know their way around the site. Other visits on the field happened during winter 2020/2021 (list in annexe).

The Restart Scampia project defined the strategic steps of Lot M, but the future redevelopment of this area can be further investigated in a multi-stakeholder approach. Social involvement in urban regeneration is particularly relevant in this context, and here it seems the critical aspect to go toward a circular city model. The area presents material and non-material elements, values of use, non-use, intrinsic and symbolic that can enable the regeneration of lot M.

The research question of this wastescape regeneration emerged in itinere. Considering the status quo and the ongoing transformations, the open question seems to be the new identity of such an iconic place. The wastescape will become a new kind of urban landscape, and it has vast regenerative potential. Vela B regeneration will be the symbol of this wastescape regeneration.

Following the Netzstadt frame, in Chapter 5.3, the analysis goes through the morphological elements of Lot M and the buildings. In Chapter 5.4, the physiology of the area is studied starting from the place-based communities and social insights. From the analysis of the status quo, the reuse of the Vela B and the public space appeared the most interesting for future neighbourhood development. Therefore, Chapter 5.5 present a multi-actor and a multi-criteria analysis for the building and public space reuse. Some alternatives emerged from interviews, surveys and literature evaluated for the regeneration of the Lot M and the Vela B, considering the actors' preferences. Urban Landscape Services are the criteria of a qualitative evaluation of the reuse alternatives. Multiple-criteria and multi-group evaluations are applied, i.e. the Analytic Network Process and the NAIADE method. The results of the analyses are samples, the ranking of alternatives and actors' coalitions follow the actor's preferences considered in this study. This approach, the evaluation criteria and the tools structure an open and collaborative decision-making process that could be developed in the following years considering other stakeholders and alternatives.

5.3 Morphology of the lot M and the Vele: The Built Environment

The physical transformations of the lot M of the Vele are a central aspect of the neighbourhood's image and future neighbourhood evolution.

At the end of the ’60s, seven high-rise tent-shaped buildings arose in two lots in Scampia: The lot L and the lot M, in the middle of the countryside and surrounded by sheep farming activities. The Vele were

completed in 1975, without the large tree-lined square with the community centre, children's play area, laundry, food and other shops, a large bar with billiard room, library and police station, designed by Di Salvo. These services were not built due to a lack of funds. Until the mid-1990s, Scampia was still a semi-rural area (Interviews with Ceccarelli and Cerullo, 2020). The New Suburbs were colonising the rural area with a bottom-up approach, generating a dramatic unresolved peri-urban hybrid (Pullan, 2011). The process of urbanisation took place together with that of social segregation. This new part of the city was advancing with buildings and huge roads, alternating with urban voids and subways. The area's semi-rural character was still perceptible in the 1990s when numerous groups of drug addicts ran around like zombies (Interview to Ceccarelli, 2020).

Scampia is a residential and working-class neighbourhood. The neighbourhood lacks several services. As part of the various actions financed by RESTART Scampia, the demolition and reconstruction project in Lot M is taking place at the same time as the completion of Gregotti's Faculty of Medicine building in Lot L.

The remaining Sails in Lot M are the neighbourhood's monuments and the most emblematic architecture in the area of northern Naples. The protest against their preservation and demolition has taken on a symbolic and iconic value for the whole neighbourhood.

Despite the significant improvement in public services in the neighbourhood over the last ten years, the housing price has not increased. It is an indicator of the attractiveness of the area. However, the real estate market in Naples and other Italian cities is subject to a long phase of a crisis, which began in 2008 and is experiencing a new peak between 2020 and 2021 due to the pandemic.

Photo 7. Photo area del quartiere di Scampia. 2021. Photo of the author.

Large road infrastructures criss-cross the neighbourhood, dividing the lots into veritable islands. The area around the Vele is difficult to cross in many places. The Villa Comunale (Ciro Esposito Park) is maintained but mainly disconnected from the neighbourhood. There are two main reasons for this:

because the entrances are often closed, and because the configuration of the edges does not allow the interior to be seen from the surrounding streets: the edges are defined by high margins, which in section define a volcanic crater shape. The most frequently opened entrance is the one on Viale Della Resistenza, in front of Cantiere 167. The perception of each lot is of a closed microworld.

5.3.1 The Lots L and M

The lot of the Vele is an almost entirely closed urban island. The buildings of the redeveloped lot L too. They function as a gated community without fences and gates. In this abandoned *Ship* (Cerullo, 2016), the inhabitants have self-organised, not only in the struggles for housing led by the Vele Committee but also in daily needs, such as reparations, management of the facilities, waste removal.

New social housing buildings in the area simplified and standardised the urban layout and improved the quality of inhabitants' daily lives. The porch on via Gobetti gave vitality to the ground floor with commercial activities.
There is no such vitality in Lot L, and the courtyard is closed, with no activities to induce the non-resident to cross it. The new venue of the Federico II Faculty of Medicine will change the current social daily composition of the neighbourhood with the new flows of students, professors and researchers, and the services for health in the neighbourhood will be an asset.
The demolition of Vela A started the new phase of the redevelopment of Lot M. It begun on February 20th 2020, with the media attention and a fest organised by the Comitato Vele (Sails Committee) in the public space between Vela C (the Yellow) and D (the Red) with a gig in the evening.
Interviews revealed that some rooms in the Vele are still open for drug consumption, but less than in the past. The lack of maintenance and services has been a silent choice of the Municipality to counter the criminal organisation of drug dealing, and more recently, to discourage new occupations of the empty premises. However, abandonment conditions have penalised all the inhabitants, including those with disabilities, on the waiting lists for council housing.
The demolition of the Vele in lot L and the total reconstruction of the lots have brought about changes and given regular homes to many families while homologating the lot to the rest of the anonymous urban landscape of the suburbs.
Alongside everyday life, a great deal of creative activity took place in these buildings. The Vele has become a text and a laboratory.
They have been the subject of street-art works by artists, filmed, photographed and narrated by writers and poets. Local singers have met other Italian singers here. A famous Scampia-born DJ recently recorded a live performance on the striking location of a Vela terrace.
Many associations made enormous efforts in the neighbourhood to offer children and young people imaginaries outside their everyday condition.
The recently demolished Vela A hosted several writings, graffiti and drawings on the walls.
One was visible from the street on the first day of demolition: *We are not Gomorra*.
Proud of their strength and fighting against the stigma, the most virtuous part of the neighbourhood is resisting and continuing on the road to regeneration, sometimes on their own and sometimes with public support.
In the context of this research on wastescapes, this case study intends to observe the complex status quo of the area opportunities and challenges of the transformation process currently underway in this remarkable medium-scale urban wastescape.
The renovation and redevelopments underway follow a neighbourhood and larger-scale strategic public policies.


RIVOLUZIONE

5.3.2 The buildings

Buildings are a resource of space and material. Morandi's reinforced concrete structures are very resistant. The demolition with explosives in 1998 was not effective in destroying it.
The Vela Celeste will be refurbished, and its use completely changed. The semi-private areas are those spaces that function as a node between public and private, connecting the function of the flats with public space and collective life. Of the morphological parts of the building, the most critical are:

- the ground floor and the semi-basement,
- the suspended corridors,
- the terraces,

These spaces offer transitional, hybrid spaces, used in various ways by the inhabitants.
The ground floor of the Sails is accessible through several entrances on each side. However, many are closed and disconnected from the external public space by a ditch that physically separates the external space.
The corridors and the ground floor are meeting points. Although the corridors are less than 2m, people meet there, and it is a place to chit chat with the neighbours. During the second visit with S. Esposito, we also spent some time talking with some inhabitants in a corridor of the Vela D.
A central in the life and safety of public spaces is the use of the rooms on the **ground floor** and in the basement.
The Kleiburg reuse project (Bijlmer's building which we will see in Chapter 6.4) highlights several small substantial changes in the structure and purpose of the ground floor compartments. These are crucial for the visual control of the public space and activating life in the public space in the buildings' vicinity of the buildings (Palestino, 2018; Gehl, 2011).

The new demolition phase started in 2020. The Vela A has been demolished between February and July 2020, producing **15000 tonnes** of CDW mixed construction and demolition waste (EWC 170904) (data source: Interview to Servizi Integrati, 2020) that, after six months from the end of the demolition, is still there amassed in situ waiting for the reuse.

Photo 8. The Blue Sail, 20 Feb 2020. Photo of the author.

Photo 9. The backbone. The semi-private space of the corridors of the Sails. Photo: Hans Wilschut, Napoli. 2013.

5.3.3 Demolition VS Restoration: The debate between function and symbol

The issue of demolition versus renovation of the Vele has divided architects' opinions over the years. The same debate involves many high-rise modern architecture buildings. Both professionals and people have different points of view on this decision.

The respondents to the survey are split down the middle on demolition (Q29, Survey on Scampia and the Vele, 2020). When the IG page Le Vele di Scampia (@leveledi scampia) asked by a 24h IG Story "they are transformed but was it the right choice?" (2020), they also shared that 62% of respondents said "no" (Annex to Section 5, Data from social networks). For the inhabitants of Scampia and the Vele, the question concerns the symbol, the personal memory, the emotional value with the place, and the landscape image. On the other hand, for the inhabitants of the Vele, demolition is the most direct way to have new "liveable" housing, without the inconvenience caused by the usual abandoned and unfinished condition of the Vele.

For architects and urbanists, the problem is mainly about whether the architectural and cultural value of Franz Di Salvo's buildings can constitute evidence of the modern movement or not. At the 2011 conference, *Le Vele di Scampia. Che fare?,* at the Department of Urban Planning and Urbanism and the Doctoral research in Urban Planning of the Federico II University of Naples (Castagnaro & Lavaggi, 2011), different positions on heritage demolition versus restoration emerged. Lavaggi, along with others, argued in favour of demolition and replacement, pointing out that recovery or replacement requires an overall strategy and that the appeal of the landmark does not take into account the functional problems due to the balcony typology, differences in construction, lack of maintenance, problems with the systems. This position, although for different reasons, is in agreement with that presented by arch. Memoli, representing the demands of the Comitato Vele, in favour of demolition. The urban (isolation, excessive concentration) and architectural (construction deficiencies, lack of maintenance and supervision) dysfunctions are traced as the cause of social degradation. In this perspective, in 2011, a new functional programme for the regeneration of Scampia and the Vele was expressed, which the RESTART Scampia project has partly answered today. In favour of the recovery of the Vele were Gravagnuolo and Dezzi Bardeschi, and later Aldo di Chio of the Vulcanica studio, along with many others.

As well as the Corviale in Roma, the Vele of Scampia has been broadly considered a failure of architecture (Molinari & Ingrosso, 2016). In Eco Web Town No. 17 - Vol. I/2018 the topic of Sails and urban regeneration of Lot M and the neighbourhood is addressed differently. Amirante et al. (2018) present project proposals developed through experiments for the renovation of Vela B. Paola Scala (2018) argues six strategic actions for the universally valid area. Starting with the need for architecture to take a step backwards, she argues for the demolitions demanded by the inhabitants. She draws attention to the need not to question the demolition but to work to manage the process of relocating families from the Vele to the new buildings as best as possible, avoiding new squatting. The regeneration process in these places must not be top-down but an open process. At the centre of this process, we need to think about Vela B, which will be renovated, becoming the element of sustainability of the whole operation.

DiARC's proposals in the strategic document were therefore neither project-based nor formal, but six actions to trigger broader processes, starting with things to be done ("possible") to be used as a trigger and to try to identify who and how they could contribute to managing these actions, which gravitate around some main places: the intermodal node, the social square, the park, Lot M, accessibility, the youth square. It is captivating the position of Palestino (EcoWebTown, 2018), who states that in Scampia, modernity should be revisited and not denied. It is reductive to flatten the fate of Scampia on the Vele controversy. It would be helpful to focus on the rich endowment of streets and open spaces. Not only changing building types and the morphology of the site. It is necessary to bring the eye of the inhabitant to the street, insert primary functions, new uses, new lifestyles, new urban routines. She says

it is necessary to create the conditions for bringing marginal areas out of the asphyxiated conditions they live by encouraging the coexistence of different user groups.
Anyhow, Piscopo and Santoro with Restart Scampia claim the necessity of a *radical solution of the demolition of the 'vele' (sails) of Scampia, with the reclamation of a residual 'vela' destined for public functions, raises more general issues regarding the reclamation of public suburbs in critical conditions,* because it is *an essential symbol of the city.*
Hence, the topic and choice seem not just functional but mainly about the demolition or regeneration of the symbol.

5.4 Physiology of the Lot M in Scampia: the place-communities

This part of the study aimed to focus on the relationship between place-based communities and their neighbourhood.
Ghetto conditions in Scampia began in the 1980s and did not only affect the Neapolitans living in the Vele. Also, the largest Roma camps in Naples was here. COMPARE association started to work in the Roma camp of Scampia, the mid-1990s to bring the Roma out of their segregated condition. The exclusion and rejection condition has also been deeply influenced by the dominant narrative linked to the stigma of degradation and risk passed by the communication industry and media.
Some alternative narratives of the other side of daily life in the neighbourhood are given mainly by inhabitants, educators, NGOs, local artists. Many local human resources have been working for years in neighbourhood regeneration. Regenerative social and urban processes are already effective, but the work is challenging and require a deep daily commitment.
Over time, the Camorra control made the Vele of Scampia the most giant drug dealing square in Europe. Today the organised crime seems to be decreased in the neighbourhood. However, the unemployment rate is still the highest in the south of Italy (70%), and the very high youth unemployment is a substantial part of the socio-economic malaise. From informal interviews, many people who lost their jobs due to the COVID-19 emergency returned to illegality.
The enormous contemporary media attention on the neighbourhood initially arose from the chronicle of the Camorra feuds between 2004 and 2005, fuelled by the book *Gomorrah* (Saviano, 2006). It spread to the cinema by Garrone's film (2008), and above all on an international scale by the Gomorrah TV series, from 2014. In this narrative of crime and discomfort, Vele became a character (Brodesco & Mattiucci, 2017), and the representation of life in these buildings started to move between reality and fiction. From a condition of actual risk and abandonment, the new showed condition to feed the stigma created around themselves.
Since 1995 the buildings have been declared uninhabitable and condemned to demolition. Meanwhile, the Vele are still a movie set being house to families, homeless and new squatters. The media speculation of TV series on the glamour of buildings symbolic of decadence and criminal life has had negative repercussions on society and on the fragile children of the neighbourhood, who already suffer daily from the allure of criminal cultural models. Local educators like Davide Cerullo complain of the presence of the series Gomorrah set as the carrier of cultural disvalues (disservices) to young people who take on those negative characters as role models because they are made famous by the media.

Figure 39. A young drug dealer poses with his gun. The Hell of Scampia. Courtesy of Salvatore Esposito/Contrasto.

Photo 10. Leisure use of the terrace of the Sails. The Hell of Scampia. Courtesy of Salvatore Esposito/Contrasto. 2009.

5.4.1 Place communities in Scampia

The dominant narrative has made Scampia famous for the presence of criminal solid groups. These have been present and probably still are. Criminality has turned the Vele into a fortress of the narcotics trade. The economy of the Camorra in Scampia has provided work and control and services to the inhabitants. It has subjugated many families in the neighbourhood and affected mental wellbeing. There is a grey zone between people and public authorities where the Camorra2 has played a decisive role. For decades, drug dealing took complete control of the Vele. Camorra gave a chance of job to all those who were excluded or unemployed.

Just as the Camorra has played a dramatically important role in the illegal waste management of the Land of Fire wastelands and wastescape, also in Scampia Camorra clans controlled and caused exclusion, degradation and many disservices. This research does not go into the role of criminal power, although everybody knows that it has been a vital agent both of discomfort and local malaise, together with the long absence of the State.

Beyond this history, many free citizens have created widespread, silent regenerative action. This chapter attempts to identify who the key players are in this process, their role, and what they are doing. Groups virtuous local actors in Scampia are working in socio-cultural processes and public space care and public art.

The NGOs, associations and groups active in Scampia are several. Some associations have quickly born and disappeared. In this context, just some main local actors are identified. They can be clustered into five main groups of public commitment:

1. The right to housing: Vele Committee, Cantiere 167;
2. Art and creative activities: GRIDAS, Mammut;
3. Culture and social involvement: Albero delle Storie, Mammut, Dream team donne in rete;
4. Self-management and care of public and semi-public spaces: Vele Committee, Il Giardino di Melissa, Pollici Verdi, Needle, informal groups of citizens;
5. Sports activities,
6. Religious groups.

The **Vele Committee** is struggling with the right to housing since the 1980s. Although social conditions have changed, it has stubbornly pursued the inhabitants' claims to decent housing. With Mayor De Magistris and his council, the Committee activated a fruitful collaboration that led to the grant for the regeneration of the suburbs in 2016.

Based on the assumption that the Vele are unsuitable buildings for residential use, the decision to demolish and rebuild was the priority for the transformation of Lot M. The new demolition phase started in 2020. The Committee put the well-being of the inhabitants at the centre of decision-making. However, the new identity of the urban landscape of the area is not yet defined. Lot L has been redeveloped to the anonymous urban landscape of the Italian suburbs.

2 Criminal association existing in the Neapolitan area since the Spanish era (16th century). A distinction must be made between the traditional Camorra, which lasted until the Second World War, and the contemporary Camorra phenomenon. (Treccani online Enciclopedia).

Photo 11. Non Siamo Gomorra (We are not Gomorra) and Oh Bella Ciao (Bye Beautiful). Writings on the wall of the Vela A. First demolition day: 20th February 2020, Scampia. Photo by the author.

Restart Scampia envisages for the regeneration of Lot M the preservation of Vela B, which will temporarily house the families assigned to new housing during new social housing construction in Lot M.

After the families have moved in, the reconversion of Vela B envisages the placement of office buildings for the metropolitan city, together with services and functions for the public.

Vela B's monumental and symbolic value left as a monument in Lot M may soon define this long history's epilogue. The project for the reuse of the building and the architectural project to redevelop the area can radically define the area's future.

Since November 2016, the 'historic' families of the sails have been relocated to new houses in the surrounding area: Via Labriola, Via Gobetti (interview to Omero Benfenati).

Their bottom-up action has produced significant changes and improvements in the neighbourhood. Some associations have given rise to several work activities (*Chikù* restaurant of *Chi rom e chi no*), and work placement activities (*L'uomo e il legno*) (Martone, 2016).

	WHO			WHERE	WHY	WHAT
	Name	Role	Relationship with the place	Location	Role, main objetives in the neighbourhood	Main activities
1	Comitato Vele	Association	Placed and active in Scampia	Le Vele	Representant of the Sails inhabitants.	Struggle for the right to housing, now collaborating in Restart Scampia with the Municipality of Naples.
2	Cantiere 167	Collective - Social Center	Placed and active in Scampia	Le Vele	Part of Comitato Vele, representant of the Sails inhabitants	The Cantiere167 is a social space in Scampia that was created to free a structure in the heart of the neighbourhood from abandonment

					in the struggle for the right to housing.	through workshops and cultural initiatives aimed at children, adolescents and adults. At the same time it is proposed to activate a path on self-employment and experimentation of community economies involving a group of unemployed young people and adults from the northern suburbs of Naples.
3	Compare	Association	Placed and active in Scampia	Piazza Giovanni Paolo II n. 3/6 - 80144 Napoli	Social volunteering association born for the inclusion of ROM community and children, it is the core of CT Mammut.	The association founded and works in the Mammut Territorial Centre.
4	Centro Territoriale Mammut	Center for research, art, culture and social involvement	Placed and active in Scampia	Piazza Giovanni Paolo II, 3/6, 81030 Napoli NA, Italy	which carries out cultural activities with young people, training courses and public events.	The Mammut Territorial Centre is a space for cultural aggregation, passions and meetings, a centre for research and pedagogical experimentation.
5	GRIDAS - Gruppo Risvegli Dal Sonno (group awakening from sleep)	Group	Born in Secondigliano, today is placed and active in Scampia	Via Monte Rosa, 90/b, 80144 Napoli NA, Italy	Since 1983, GRIDAS has been promoting the local carnival in Scampìa on topical themes and workshops for the recovery of manual skills, as well as free alternative film forums at its headquarters, offering films usually "avoided" or relegated late at night from TV or cinemas.	"GRIDAS (group awakening from sleep) is a non-profit cultural association founded in 1981 which aims to awaken sleepy consciences". A historical reference group of the district and all the social centres that participate in the social Carnival of Scampia.
6	BandaBaleno - Murga Di Napoli	Music Group	Placed and active in Scampia in the venue of GRIDAS	Via Monte Rosa, 90/b, 80144 Napoli NA, Italy	BandaBaleno was born as a pedagogical project in Scampia, a district of Naples, in 2008 from the meeting between the artists of the Malamurga of Rome and some Scampia activists during the neighborhood Carnival promoted by the Gridas.	They encourage aggregation and stimulate creativity through an experimental path of growth related to the Murga (street art made of percussion, dance and theatre), the animation of public spaces, travel and discovery.
7	Dream Team - Donne in Rete	Association	Placed and active in Scampia	Via Galileo Galilei n.5 – 80144 – Napoli	Donne in Rete è una rete di associazioni, socie ordinarie e cooperative che operano nel settore del volontariato, della cultura, dell'ambiente e dei servizi, della formazione e dello sviluppo territoriale. Nasce	Its aim is the enhancement, strengthening and professional development of women and the promotion of gender culture. At its operational headquarters, DT manages a reception, listening, work orientation, psychological support and first legal counselling desk for women in the northern area of Naples, as an anti-violence centre. It offers courses for self empowerment,

					allo scopo di rappresentare gli interessi e i bisogni delle donne, nonchè di quei soggetti senza rappresentanza.	psychophysical wellbeing, professional training and sports for adolescents as a tool for social inclusion.
8	Centro Hurtado		Placed and active in Scampia			The Jesuit Fathers, who have been present in the neighbourhood since the 1990s, have always dedicated themselves to an essentially pastoral activity but, with a strong social sensitivity, have tried to propose cultural and work opportunities to the citizens, with the aim of raising awareness of socio-cultural change.
9	CentroInsieme Onlus Progetto "Vela: Rendere Consapevoli" (Project "Sail: making people aware")	Onlus Association	Placed and active in the blue Sail in Scampia	In the blue Vela	The CentroInsieme works for minors in conditions of objective discomfort, connected to particularly disabling psychophysical situations, situations of deviance, degradation or serious economic and family hardship or social marginalization, has launched numerous activities with the specific objective of combating early school leaving and school dropout.	The project "Vela: making people aware" originates from the past collaboration between the Fondazione Un Raggio di Luce Onlus, the Casa della Solidarietà di Quarrata, the Don Milani Centre, the parish communities of Vicofaro and Ramini, Patrizia Mincione and Davide Cerullo , , on the theme of legality and the situation of degradation and violence that makes Scampia one of the most tormented territories in Italy.
10	L'albero delle storie (The tree of the stories)	Onlus Association	Placed and active in Scampia	Via T. Galimberti, Torre 2, 80145, Rione Scampia - Napoli	L'ALBERO DELLE STORIE is an association for social and cultural promotion. "The roots of the Tree of Stories are in the personal story of Davide Cerullo: born and raised in Scampia, Davide emancipates himself from the underworld and finds his redemption in poetry, photography and education. A story of resistance against forms of oppression, isolation and silence. A place of dialogue, community participation, of redemption of a childhood denied by the oppression of the	Its activities are carried out in a cooperative and participatory way. We place dialogue at the heart of our educational principles. We are committed to involving civil society in our activities: universities, schools, art academies, neighbourhood committees, scouts, but also writers, poets, directors, individual citizens. At the moment we have three fields of action: - the toy library (right to childhood), - the redevelopment of public spaces (land law), - adult education (right to dialogue).

					organised crime system. A place that gives back to the children of the neighbourhood those rights that have long been denied them: the right to childhood, to play, to listen, to dialogue, the right to live in healthy and happy places. THE TREE OF STORIES IS THE PEDAGOGY OF RESISTANCE."	
11	L'uomo e il legno (The man and the wood)	Social Cooperative	Placed and active in Scampia	Viale della Resistenza, 15, 80145 Napoli NA, Italy	The cooperative has been operating since 1995 with the aim of promoting integration through social and work integration.	Projects of urban agriculture (at the Masseria Ferraioli Afragola), falegnamery with a FabLab producing 3D, furniture production, violin making; education for students and teachers, job placement.
12	I pollici verdi (The Green Thumbs)	Association	Placed and active in Scampia	Via Hugo Pratt 33, Napoli, Italy	Green care of the Lot W in Scampia.	Creation of a public and accessible green area of Corto Maltese Park.
13	Chi rom e chi no	Association	Placed and active in Scampia		The social promotion association "chi rom e...chi no" was founded in Scampia (Naples) in 2002.	
14	Chikù	Restaurant	Placed in Scampia	Viale della Resistenza, Comparto 12, Scampia 80145 Napoli, Campania	Chikù is the first Italian-Balkan restaurant in Scampia.	It is a place of multicultural gastronomy and pedagogical experimentation, dedicated to children, young people, adults and families.
15	Needle	Association	Placed in Naples, worked in Scampia in 2019/2020	Gridas venue and Pinetina Monterosa	Restore of the green public park "Pinetina Monterosa"	
16	"Le Vele di Scampia" (group composed mainly by Scampia inhabitants)	FB / Instagram public page	Social network group on FB (followed by 4116 people) and IG	on line	Common interest public communications between neighbourhoods	
17	Sei di Scampia se…	FB / Instagram public group	Social network group on FB (7274 members) and IG	on line	Sharing of useful information for neighbourhood	
18	Comitato Lotto P	Resident Group	Placed and active in Scampia	Via Ernesto Rossi, Napoli, Metropolitan City of Naples, Italy	Small group of voluntary and residents who are remedating and restoring the green areas of Lot P for the children.	
19	Cooperativa La Roccia					

20	Il giardino di Melissa	Environmental protection organisation	Placed and active in Scampia	Via Tancredi Galimberti, 80145 Napoli NA, Italy	Group of volunteer who care a public garden from 2012	

Comitato Vele and *Cantiere* 167 are the inhabitant's groups active since the ’80s.
The protests against the Chiaiano landfill can be placed in the short history of ecological protests from below in Italy (Nebbia, 1994) and the global phenomena of socio-environmental conflicts mapped by the EJ Atlas (Martinez-Alier et al., 2016).
In line with the Restart Scampia project, when the current inhabitants of the Vele are transferred to the new residences, Vela B will be renovated and reused for other purposes. The Vele Committee has said, "never again houses in the Sails". The demolition of the buildings that are contemporary ruins degraded and abandoned for decades, a fortress of the underworld and symbols of delinquency, drugs and marginalisation, will be cancelled.
According to the project's promoters, the Vele wastescape will be freed of its stigma by giving new vitality to the area through new uses in Vela B. The municipality plans to locate in Vela B the offices of the Metropolitan City of Naples, together with a series of services that will also be useful to the neighbourhood daily.
Until a few years ago, the community of place living in Lot M consisted of a predominant component of the criminal system, which offered work by imposing the management of buildings and public space as a function of drug dealing. This place was Europe's most significant drug dealing centre between the 1990s and around 2010.
Nunzio, a resident of the Vele for 30 years waiting for a house, says that the renovated Vela would be beautiful and that "flats this big are not built anymore" (Polizzi, 2016, 00:05:17). Residents themselves say that the delinquency of yesteryear is gone and that many allottee families have been relocated. However, many occupants left, indeed that '100 go out and 200 come in, and according to one interviewee (Polizzi, 2016), that is why the Sails will never be demolished.
The language of art has been used in Scampia for over 20 years to strengthen the social fabric (Palestino, 2012).
A network of cooperatives and associations, led by the Circolo La Gru di Legambiente, Aldo Bifulco, won the "GreenCare 2017 for the care of public greenery" award thanks to the Pangea Project! The award recognises deserving caretakers of urban greenery in the Naples metropolitan area to promote a "greener" civic sense.
The Pangea Project revived the six flowerbeds in Largo Battaglia with the creation of the "Garden of the Five Continents and Nonviolence" in Scampia: Pangea aimed to promote a training course in nonviolence in a district where violence is, unfortunately, the order of the day, as well as to recover and to upgrade an area of the city that had been in a state of total neglect and degradation for years.
Specifically, the Pangea Project involved six associations: the Legambiente "La Gru" Club, ARCI Scampia, the Aquas association, the Dream Team-Donne in rete association, Garden Ladies, the CentroInsieme Onlus; five schools in the neighbourhood: the "Elsa Morante" High School, the "Galileo Ferraris" ITIS, the "Melissa Bassi" ISIS, the "Vittorio Veneto" Institute and the "Attilio Romanò" IIS. Regarding other associations and citizens who collaborate, we find the association "Scuola di Pace", GRIDAS, the social coop. "L'Uomo e il Legno", the association "Ciro Vive", the association "Volontari per Napoli ripuliamo Napoli", the Day Centre "Gatta Blu".
The GRIDAS, acronym of “Gruppo Risveglio dal Sonno” (“Group for the Awakening from the Sleep”), is an association active from 1981 in the Scampia district. Their actions are focused on putting artistic and cultural skills into people's service to awaken a form of collective civil consciousness.
The Mammut Territorial Centre is an experimental research place of educators who mainly work with young people of the neighbourhood.

L’albero delle storie. **L’albero delle Storie** (The Tree of Stories), lead by the writer and poet Davide Cerullo, works to educate young people about beauty and a new relationship with Nature and others. This small space in Scampia offers a fantastic cultural alternative to the wastescape of the Vele. It is a tangible deep ecology niche in practice that opposes a simple and natural lifestyle to the criminal fashion and the spectacularisation of the criminality made by the Gomorrah series. Davide Cerullo strongly expressed against the new series. The fifth season due to being released in 2021, should be the last. It did not help to fight the culture of criminal power.
The rap of the suburbs of North Naples as elsewhere tells the myth of wealth, material well-being, power, and feeling fulfilled through control and respect. The superficial myths of consumer society are embodied in the dreams of many young people with weak cultural references.

Inhabitant self-organization is evident in shared space care and in creating cared public gardens next to their houses. These actions are tangible signs of virtuous place-based communities organized in communities of practice. Three significant examples are:

1. The Corto Maltese Park
2. The Melissa Garden
3. The Garden in Lot M next to the Vela B.

Vicario says the Melissa Garden was born as an act of 'revenge' in 2012, during a feud, when the neighbourhood was abandoned by the state (Di Martino, 2017, 00:41). The place where it was founded was a dump. Over time it grew and became very large, managed and cared for by citizens voluntarily. This experience set a school: it gave birth to 300 green areas in Naples, 40 of which in Scampia.
The Camorra has been a large community of place with its headquarters inside the Vele for decades. Davide Cerullo, talking about the regeneration of Scampia, expresses the need for a re-foundation of meaning. This new humanism puts man in contact with nature, society, with its environment. A landscape was suddenly invaded by concrete megastructures in which thousands of people were coexisting and not living together because they were not already communities. The architecture was not enough to realise the modern utopia of collective living. Strategic planning, instrumental in solving the problem faster, used architectural design to allocate as many people as possible. Moreover, following the 1980 earthquake, the Vele were occupied by all the displaced persons searching for a home.
In “L'altra Scampia, la Storia di Davide Zazzaro: ristrutturare una Torre per riqualificare il quartiere” (7 October 2012), Davide says that the Veronica Tower had to be demolished many years ago because there is much asbestos, but it is still there. The residents have cleaned the gardens and the lighting. After many requests, they did maintenance work on the infiltrations from the garage, but the work was

poorly done. Since 2008 there has been no drug dealing in the Tower. The feeling among the inhabitants is that some people do not want Scampia to change. The primary need is how to create development.

The Roma community: a ghetto within the ghetto (racconto di Chiara Ceccarelli)

Photo 12. A terrace of the Red Sail. July 2020. Photo of the author.

In Scampia, the environmentalism of the poor (Alier, 2003) manifested itself through the popular protest movements against the Chiaiano landfill. Vittorio Passeggio led the Vele Committee for more than twenty years. In the documentary 'The man with the megaphone', there are testimonies of the assemblies of the Vele inhabitants who speak of a 'zero waste' neighbourhood willing to engage in careful differentiated waste collection and not to have a landfill in an area of the city that is already 'like a landfill'. They struggled against the Chiaiano landfill in the neighbourhood next to Scampia. Not far away, other organised citizens' groups and movements demonstrated against the Acerra incinerator.

In the interviews and survey on Scampia, the strong bond of all inhabitants with the neighbourhood stands out.

The **Scampia Carnival** started with a small group of people of the GRIDAS Association in Scampia. It is a self-managed Carnival. Today it gathers thousands of people every year and associations from all over Italy.

Associations Mammut has been working in the neighbourhood for years and has created an enormous sense of community among active young citizens and their families. (Di Martino, 2017)

The inhabitants of the Vele are 250 families (interview to Omero).

Much happens in the Vele beyond daily life: the fight for the right to housing, music, Franco Ricciardi - Braco, graffiti, clandestine activities of excellent or lousy self-management, drug dealing)

In Scampia, community-led local development started with associations. Communities of place (Manzini) became communities of practice to satisfy their fundamental human needs (Max Neef). Nevertheless, if the crime takes over, the role of the state is necessary for controlling security.
For a foundation of social practices (Guattari, 1992)
Public art and street art showed they are tools of urban cultural regeneration, but work and urban care
There are over two hundred works made by GRIDAS in the Neapolitan hinterland and in other Italian cities, from Trento to Reggio Calabria: a research and production that makes Pignataro the "most prolific muralist in the world", to mention the definition given by the art historian Ernst Hans Josef Gombrich (Warburg Institute, London).
The Project Room of the Madre museum holds Felice@Madre showed a selection of the works created by Felice Pignataro and GRIDAS since the 1980s: a collection of banners and canvases depicting popular "stories", paper-masks and polyurethane foam masks – like those displayed in the museum's atrium, among which stands the statue of San Ghetto Martyr, Protector of the Suburbs –, sculptures made with recycled materials, self-printed and line-based posters, that give back the sense of art in continuous dialogue and confrontation with the facts and events that have highlighted, from a social and cultural point of view, the history of the suburbs areas of the city of Naples in the last decades, the outcome of centenarian processes of marginalization on the one hand and of resistance on the other.
The presentation also includes a small retrospective of the Scampia Carnival Parade: one of the many initiatives, perhaps the most iconic, through which GRIDAS – taking up back also the teaching of artists whose works are involved and dissolved in the social context, among them, Piero Gilardi in Turin, whose works and materials are also part of the Madre museum's collection – brought creativity to urban areas where that, had not been foreseen. Therefore, art was created and accepted as a job or personal redemption of the assumption of civil responsibility and the practice of active citizenship. Actions often impromptu and realized in a short time, to deserve the title – given by Pignataro himself – of actions of "cultural first aid". On one of the two monitors set up in the hall flow, the images created by Pignataro settled in their urban context. In contrast, there are extracts from interviews and documentaries dedicated to the association and its founder on the other monitor.
The Felice@Madre exhibition took place in the context of Madre per il Sociale – a new platform devoted to educational activities and networks of social inclusion projects – also including, in July 2018, the laboratories held in the museum by associations that regularly collaborate with GRIDAS.

The desire for urban regeneration based on art and culture has been present in the neighbourhood since the 1980s when Felice Pignataro (founder of the Gruppo di RIsveglio DAl Sonno GRIDAS) partner Mirella) painted murals between Secondigliano and Scampia.
The semi-structured interviews have been the tool to get direct insights about different views and experiences of people who lived in the neighbourhood and are involved in the regeneration process differently (*Table 19*). The complete interviews can be read in the Annexes to Section 5.

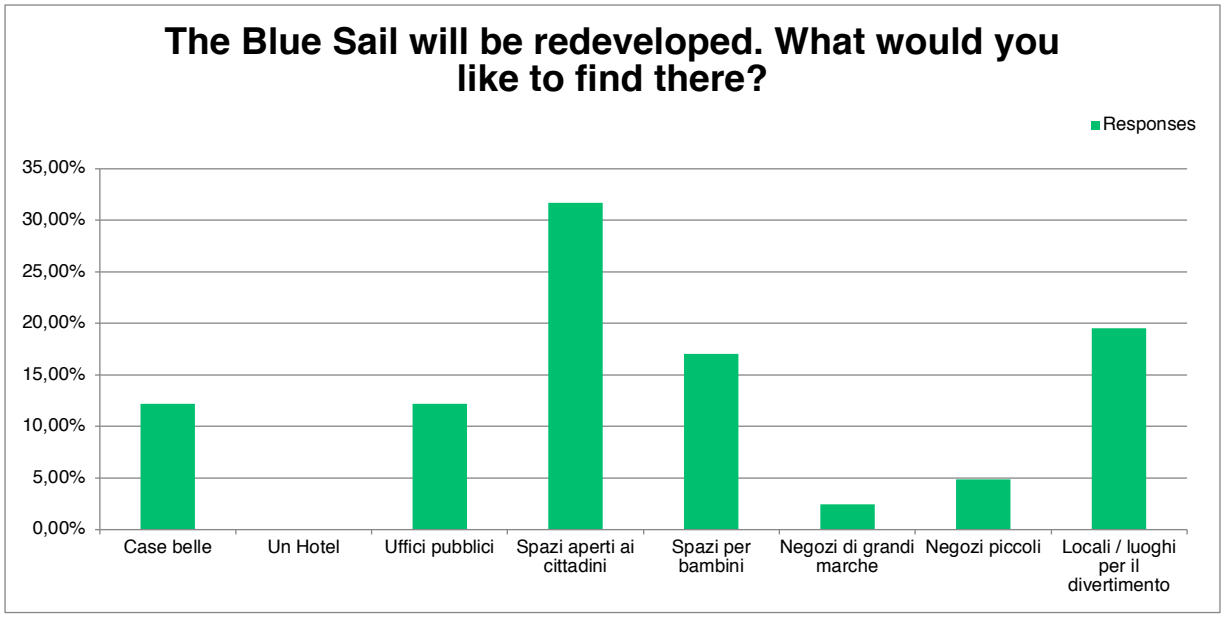
Table 19. Semi-structured interviews on Scampia and the Vele.

N.	Intervieew	Subject
1	Hans Wilschut	Art as a knowledge tool to understand space and architecture
2	Salvatore Esposito	The direct experience for the reportage photography "The hell of Scampia"
3	Daniela Buonanno	Public administration strategy in the RESTART Scampia project
4	Nicola Salzano de Luna	The technical aspect of the Vela A demolition
5	Omero Benfenati	The struggle in the right to housing and the people organizazion in the Vele
6	Davide Cerullo	Personal point of view on the life and needs of the neighbourhood
7	Chiara Ceccarelli	Personal experience in social volunteering in Scampia
8	Simone *Samurai* Torrone	Personal experience living and working in the neighbourhood
9	Gianluca Raro	Personal experience living and working in the neighbourhood
10	Enzo Crispino e Antonio Brandi	Auto-organization. A case of creative self-management of an empty space in the Vele

Type of Interview	N.	Name of the interviewee	Age	Role	Main relationship with the Sails of Scampia	Place of the meeting(s)	Object of the interview/conversation
informal interview	1	M	around 50	Man of 31 - Sail squatter	M was a drug dealer, at the moment of the interview, he was living there next to all his family. Today he works and he is writing a book.	Red Sail	How living in the area was 10 years ago and how it is today, changes and daily difficulties.
	2	P.	around 30	Man > 50 - Sail squatter	Former builder, ex criminal, at the moment of the interview under house arrest, he opened the door and invited to his terrace offering beverages.	Red Sail (by chance)	Self-organization of the inhabitants of the abandoned buildings.
	3	Nancy Gallifuoco + 1 friend	19	Young girl of Secondigliano who lived indirectly the Sails (18)	Some relatives used to live in the red Sail, after my survey in May 2020 she contacted me because she is sorry about the demolition.	In Secondigliano and in the red Sail	Link with the place, opinion about the demolition of symbols which for her are places of childhood memory.
	4	Patrizia Palumbo	around 50	Inhabitant, feminist, activist, part of Donne in rete Association.	Active in project several socio-cultural project all over the neighbourhoos.	Phone call.	She prefers to focus the attention on the whole neighbourhood, not just on the Sails that are a negative symbol. She highlight the presence of many associations and people active in socio-cultural and sport initiatives. involving young people and residents.
formal interview	5	Omero Benfenati	41	Inhabitant of the Sails and representant Vele Comittee	Representat of Comitato Vele, successor of Vittorio Passeggio (founder).	Telephone call	The history of the Sails over time, the struggle of the Sails Committee, the right to a home and the city, the co-designing process underway with the City of Naples with Restart Scampia.
	6	Chiara Ciccarelli	40?	Compare Association	Socio-cultural volunteer in Scampia.	Many call, messages and whatsapp meetings.	Social association active in Scampia for 25 years and founder of the Mammut Territorial Center, one of the most important cultural reference point in the neighbourhood.
	7	Daniela Buonanno	/	Municipality of Naples	Working in the Restart Scampia project.	Teams video call	Public employee of the Municipality of Naples working with the Assessore Piscopo in Restart Scampia.
	8	Ing. Salzano De Luna	/	Engineer - SERVIZI INTEGRATI s.r.l.	Demolition of the Sail A.	Writed answers to a questionairre.	Engineer involved in the demolition project of the Sails.
	9	Aldo Di Chio	/	Architect - Vulcanica architecture	Public opposition to the demolition of the Sails.	Meeting at his office	Architect against the demolition of the buildings.
	10	Simone Torrone	22	Youg inhabitant of Scampia (22)	Young inhabitant of Scampia, street artist, jam organizer, street artist.	Many whatsapp messages, phone call and a formal interview.	Entusiastic young living in Scampia, active in street art and public events. He started doing street art in the Sails.

	11	Salvatore Esposito	42?	Photoreporter	He has been part of a gang between 2008-2009 to realize the reportage The Hell of Scampia.	Call interview and meeting in Scampia	His perception of the place along time, the experience there to realize a photoreportage.
	12	Hans Wilschut		Photographer and director	He is the director of the movie "La Nave", a portrait of the Sails daily life with a surreal point of view.	Writed answers to a questionairre.	His artistic experience and the movie La Nave.
	13	Gianluca Raro	32	Artist, muralist, street-artist (32)	Personal experience and vision for the future of the Sails.	Meeting in Scampia at Pinetina Monterosa and call interview.	His experience in the neighbourhood, visiting and living it from 20 years. He started doing street art in the Sails.
	14	Davide Cerullo		Inhabitant, writer, active with child pedagogy projects	Born in Scampia and lived there all the life.	Phone call interview.	Conversation on the main problems of the neighbourhood today, beyond the apparence of media and official data.
	15	Alberto Grosso	/	ARPAC	Arpac waste cadastre. Interview about the waste of the Sail of Scampia.	Phone call interview.	Ok il riuso degli inerti in situ ma andrebbe visto un test di cessione, per la presenza del gesso.

The survey to the inhabitants of the district shows that in Vela B, preferences are expressed:



The muralist Gianluca Raro commented (Raro, 2020, 12 November):

> *By now, the Green Sail is gone. All that remains is a pile of rubble. The evening before the demolition, the yard is illuminated by the headlights pointing at the Sail. I approach it to say the last goodbye, and I look at it melancholically. I hear the voices of those inside the yard who are finally celebrating. As I do so, I symbolically leave my greeting "GIVE US A MUSEUM" as if the Sail were speaking. There inside were some of my first brush drawings that were part of my growing up, part of my adolescence. A single-eyed snail, a stylised Maradona, trim trees, magic birds, rainbows, a mountain of ice cream on a scale, a few throw-ups, a piece of writing here and there, a gun wrapped in barbed wire, the mega poster of the state of decay broadcast on Sky Art. Drawings were mainly made with the young people who lived there. Of my first drawings of the writings and signs on those walls, all that remains are a few photos and a few memories of the past inside that giant. I am pleased that someone*

attentive has grasped its meaning and its value and has written a thought that I share and to have approached me: FATE PRESTO, the title of Roberto Ciuni written in large letters on the front page of Il Mattino in 1980 in the aftermath of the earthquake that devastated Naples, and of which Andy Warhol will create a colossal work for a group exhibition of the Neapolitan gallery owner Lucio Amelio.

The request to *GIVE US A MUSEUM* expresses a strong message: the need for beauty and culture to regenerate the space and the spirit of the inhabitants.
The decision-making problem of the Vela B reuse and the public space is structured according to the preferences expressed by the citizens through the survey and the hypotheses that the participants in the interviews and the survey expressed their wishes for the future use of Vela B and the public space.

5.5 Lot M transformation: A methodological approach to the reuse of the area

Naples' strategic development plan (Immagina, 2019) has sustainability goals but not specific circular economy targets. Circular models implement long term sustainability strategies so that they can be considered as a different approach to sustainability. The redevelopment of Lot M and the reuse of the Vela B are opportunities to transform the area according to the circular city model. In this Chapter, the circular model proposed is about the co-creation of reuse alternatives and the EISs implementation (REPAiR, 2008) in a multi-actor perspective for the Lot M transformation (Figure 40).
The different transformation alternatives can be assessed with multi-criteria and multi-group methods, considering parameters involving morphological and physiological aspects of the urban context, i.e. the Urban Landscape services, that Chapter 3.2 introduced.
Besides the enormous opportunity of any urban regeneration, Lot M is at the centre of the Scampia regeneration image. It will have a tremendous symbolic value for all the neighbourhood.
Restart Scampia project foresees the reuse of the Vela B as the Metropolitan City od Naples headquarter offices. Small commercial activities and citizen services will naturally rise (interview with Daniela Buonanno) and animate daily life. The new social housing and the public space will be the object of international competition.
As stated in Section 2, the wastescape regeneration should improve the urban circularity through a loop, regenerative and adaptive actions activating circularity and self-sustainability.
In the context of Scampia, it is essential to consider the symbolic and iconic value that the area regeneration will assume and the Vela B reuse. It will produce an immaterial, iconic and symbolic value of this wastescape regeneration. Besides technical and technological solutions for circularity, a circular and self-sustainable model require a collaborative approach to regeneration, which means local actor active involvement.
For years in Scampia and Naples, many new interventions made with difficulty by the municipality with public funds have been vandalised and destroyed. Vandalism is a sensor of the detachment between citizens and institutions, rejecting any public new transformation, urban furniture or other public goods given and top-down created. The circularity challenge in Naples is in the durability of new projects (interview to Daniela Buonanno). In Scampia, we can find both vandalism, like the concrete benches destroyed in the Ciro Esposito park (Interview to Simone *Samurai* Torrone, Annex to Section 5), and many self-regenerated public spaces made by the place-based community (as the example of the Corto Maltese Park created by Pollici Verdi).
Thus, new circular functions and activities need to be: (1) Looping; (2) Adaptive; (3) Regenerative.
Need technical features but a bottom-up community involvement in the creation for long term sustainability.
The regeneration process of the neighbourhood has been explored by the DUN group in the consulting for the Urban Regeneration Programme for Scampia (Programma di Riqualificazione Urbana per Scampia) (Palestino, 2021).
A more collaborative decision-making process for the Lot M regeneration would allow to:

- making local actors part of the transformation, creating a stronger bond with the future place;
- implementing actions that could work in co-management in PPPP (public, private, people).

Considering this background, the main RQ about the goal of the transformation of Lot M could be:
What could be the new identity of lot M and Vela B?
Moreover, consequently: 1) Which functions could be implemented in Vela B according to the local actor preferences? Which new functions for the public space? 2) Who would be actively involved in the regeneration?

In the following Paragraphs, this decision problem is structured using two complementary MCDMs (Paragraph 5.5.1): the ANP and the NAIADE. The Analytic Network Process (ANP) supports a qualitative evaluation of alternatives and impacts with a ranking of the alternatives according to multiple dimensions (Paragraph 5.5.2). The Novel Approach to Imprecise Assessment and Decision Environments (NAIADE) provides a multigroup evaluation of preferences, according to the alternatives, in a dendrogram of coalitions from an equity matrix (Paragraph 5.5.3).

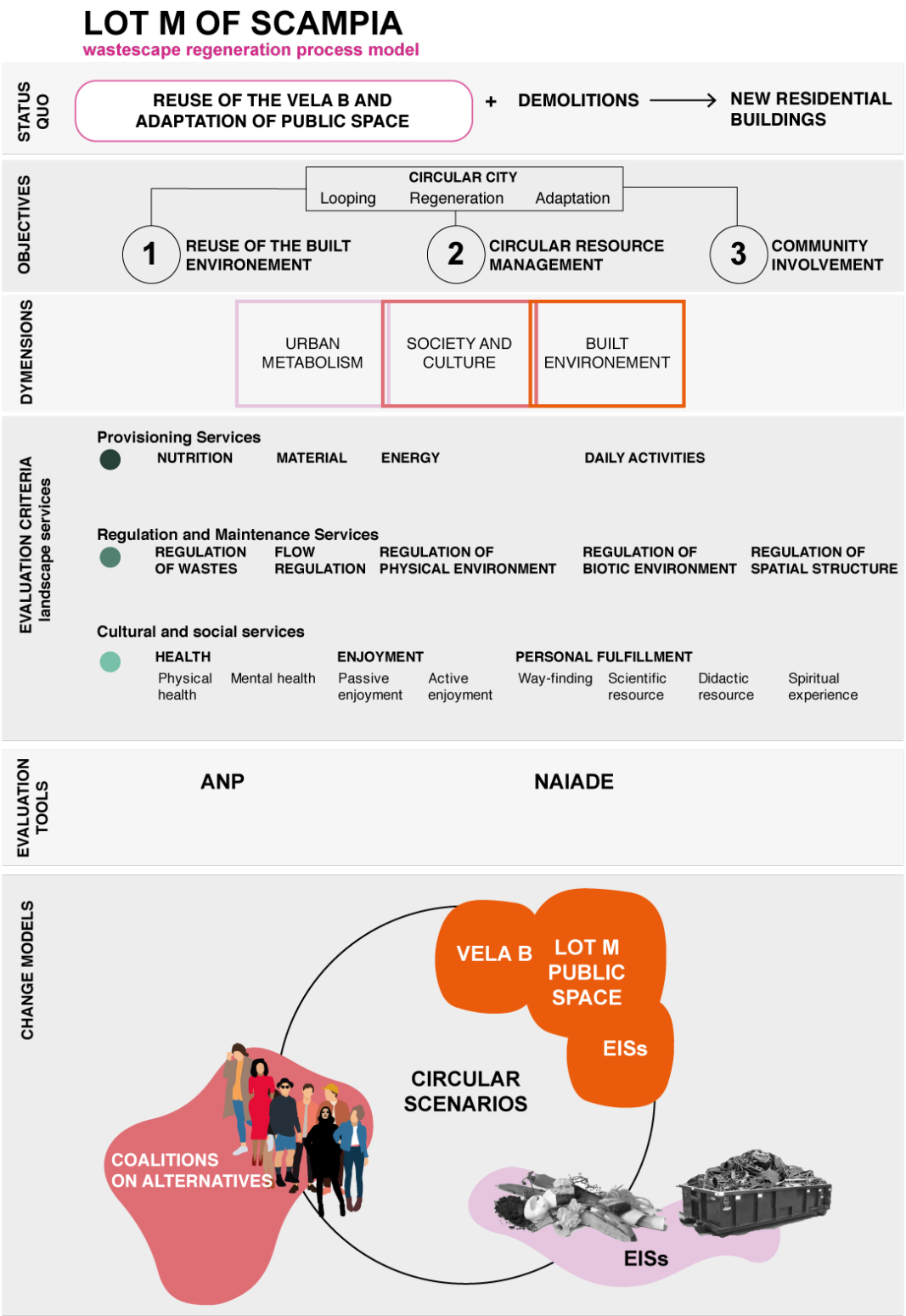


Figure 40. Elaboration of a circular model for the Lot M reuse.

The multiple criteria evaluation result is sensitive to the stakeholder's preferences and the process. Thus, the goal here is not to provide results but to show the structure of an inclusive process to cope with the reuse of this area this wastescape regeneration.

5.5.1 The decision problem: Alternatives, actors, and evaluation criteria

The decision problem of the circular reuse of lot M has slipped up in three:

- the reuse of the Vela B;
- the reuse and redevelopment of the public space of the lot;
- the implementation of looping actions (EISs) for the circular economy.

The structure of the decision problem is based on the definition of alternatives, actors and evaluation criteria that emerged from literature, surveys and interviews for Vela B and the public space. Also, the documents drawn up by neighbourhood associations, the RESTART Scampia feasibility plan, the Scampia Felice proposal (2011) are considered. All the sources picture different visions for a liveable and multifunctional urban landscape. The main uses alternatives are described associated with their NACE codes (*Table 20*), which constitute control parameters in the circular activities monitoring (Chapter 3.2.3) to measure the metabolic balance.

The regeneration project will lead to many small enterprises around the residential new buildings. Vela B's identity will profoundly influence the daily life of the area, the people flows, and the secondary activities. The different alternatives are described in:

Table 20. Adaptive reuse alternatives for the Vela B future identity.

CODE	Alternatives for the reuse of the Vela B	Description	NACE
A1	Institutional offices	RESTART Scampia foresees to convert the building in the MAN headquarter offices	84.11 - General activities of public administration
A2	Place of sociability	Co-working spaces, venues for NGOs, local associations, and open areas for citizens	94.99 - Activities of other membership organisations n.e.c.
A3	Place of culture and creativity	Museum, culture-hub, art school, laboratories for creativity	91 - Libraries, archives, museums and other cultural activities
A4	Place of sports	Gym, sports centres, sport facilities	93.1 - Sporting activities
A5	Temporary Housing	Student houses, short-term rentals and hotels, considering new flows of students and the strategic location	55 - Hotels and similar establishments
A6	Commercial centre	Mall, shops. Currently, Scampia has few shops, mainly supermarkets, and essential activities. A mall would attract many people and create many jobs.	

Similarly, the public space can host different areas with uses, but the primary identity should be identified to make it effective and productive. It also will influence the surrounding activities on the ground floor (Tab. 9).

Table 21. Adaptive reuse alternatives for the Lot M public space future identity.

CODE	Public Space Reuse Alternatives	Description
P1	Outdoor games for children	Several outdoor play areas, swings, slides, castles, paths etc.
P2	Outdoor sport facilities	Various types of outdoor sports equipment: gymnastics, football, basketball, volleyball, skateboarding, etc.

P3	Public space for resident leisure	Areas equipped for resting, barbecues, picnics, covered areas for studying, working, playing, etc.
P4	Urban gardens	Urban gardens of different local crops, cultivation of fruit trees etc.

Three eco-innovative solutions (EISs) from the REPAiR Naples case study (D.5.3, REPAiR, 2018; Garzilli, Mazzarella & Vittiglio, 2019) can implement looping actions at this very local scale. These EISs are suitable to be planned together with reuse projects (). In the REPAiR project, EISs were developed to cope with organic and construction and demolition waste streams circular management. Furthermore, CIRO was proposed by Campania PA in response to the problem of abandonment of durable goods along the streets (D.5.3, REPAiR, 2018). These small reuse activity seems to suit this area because community composters can be placed in any green park or open space. A small collection centre for construction waste or a CIRO can be realised in enclosed spaces and warehouses at street level, in acoustically isolated premises.

Table 22. REPAiR Eco-innovative solutions applicable through adaptive reuse.

CODE	Eco-Innovative Solutions	Description
EIS1	Small community composters	Organic Waste recycle
EIS2	**CIRO** centre	Durable goods repair service
EIS3	CDW recycle and reuse centre	Reuse and recycle in situ of CD debris

Given the set of alternatives, in the multi-actor co-creation approach to creating and managing the reuse, **who would be actively involved in the regeneration?** Several local actors and NGOs are already operating in Scampia to enhance creativity and social inclusion. Residents, organizations, stakeholders, public bodies and future neighbourhood users can be considered stakeholders of the decision-making process (*Table 23*).

Table 23. Scampia stakeholder groups and actors.

CODE	Category	Description
G1	Residents	Inhabitants of the Sails, of Scampia and from the district
G2	Cultural institutions	People, groups and associations active in artistic and cultural projects
G3	Sports organizations	Sport institutions and groups
G4	Companies/investors	Stakeholders that want to invest
G5	Public bodies	Municipality, Metropolitan city of Naples etc.
G6	Environmental groups	Associations and groups active in green care
G7	Educators	Associations active in education for young and adults
G8	Political committees	Comitato Vele and others active in the right to the house
G9	Job training groups	Associations active in job training
G10	Non-residents	People from other neighbourhoods or tourists

The landscape services support evaluating the Lot M system (Tab. 21) here considered in the transformation of this urban landscape.

Table 24. Landscape services (Valles-Planelles et al., 2014)

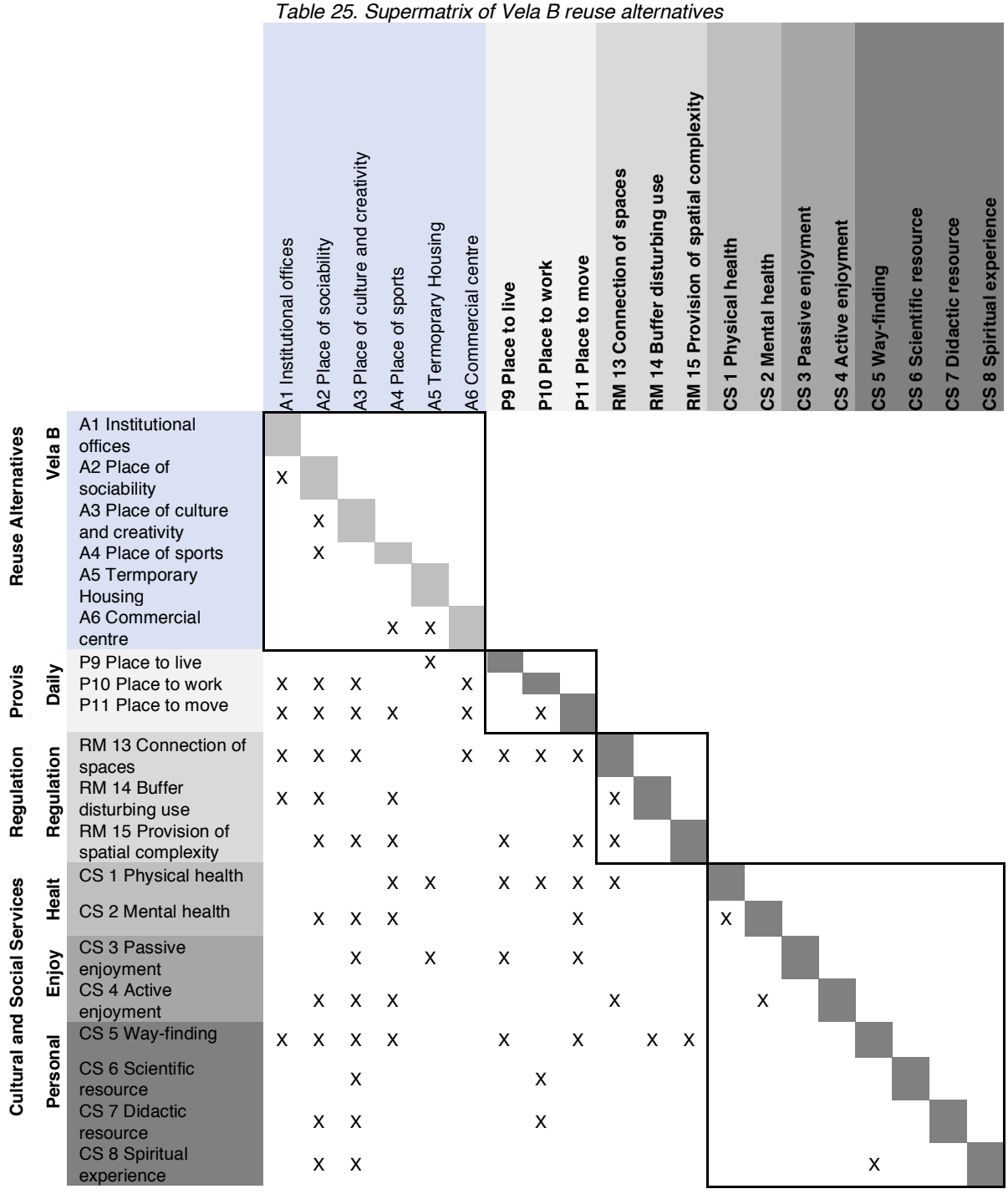
THEME	CLASS	GROUP
Provisioning	Nutrition	Terrestrial plant and animal foodstuffs
		Freshwater plant and animal foodstuffs
		Marine plant and animal foodstuffs
		Potable water
	Material	Biotic materials
		Abiotic materials
	Energy	Renewable biofuels
		Renewable abiotic energy sources
	Daily Activities	Place to live
		Place to work
		Place to move
Regulation and Maintenance	Regulation of wastes Flow regulation	Bioremediation
		Dilution and sequestration
	Regulation of physical environment	Air flow regulation
		Water flow regulation
		Mass flow regulation
		Atmospheric regulation
		Water quality regulation
	Regulation of biotic environment	Pedogenesis and soil quality regulation
		Lifecycle maintenance and habitat protection
		Pest and disease control
		Gene pool protection
	Regulation of the Spatial Structure	Connection of spaces
		Buffer disturbing use
		Provision of spatial complexity
Cultural and Social	Health	Physical health
		Mental health
	Enjoyment	Passive enjoyment
		Active enjoyment
	Personal Fulfilment	Way-finding
		Scientific resource
		Didactic resource
		Spiritual experience

Landscape services embrace material and immaterial values of both physiologic and morphologic urban areas.

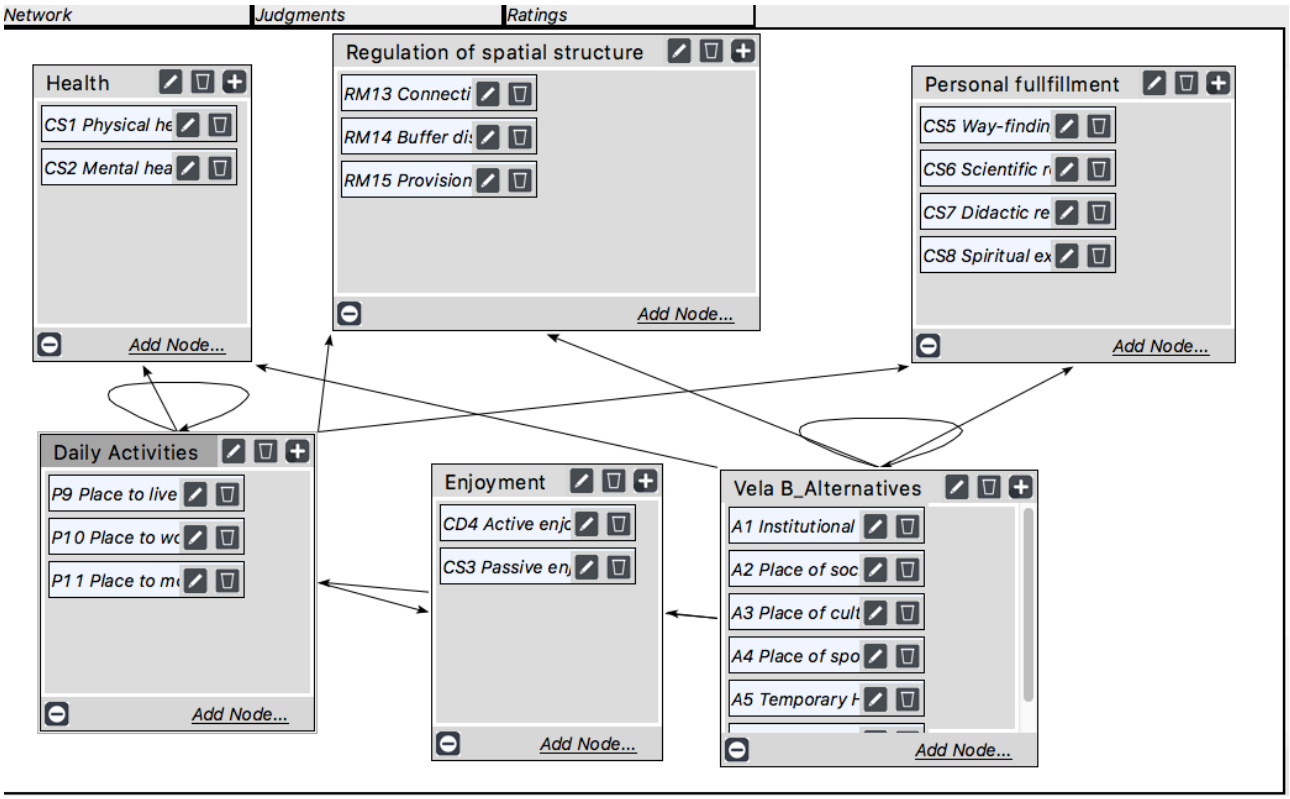
5.5.2 The ranking of alternatives for the Vela B: the Analytic Network Process

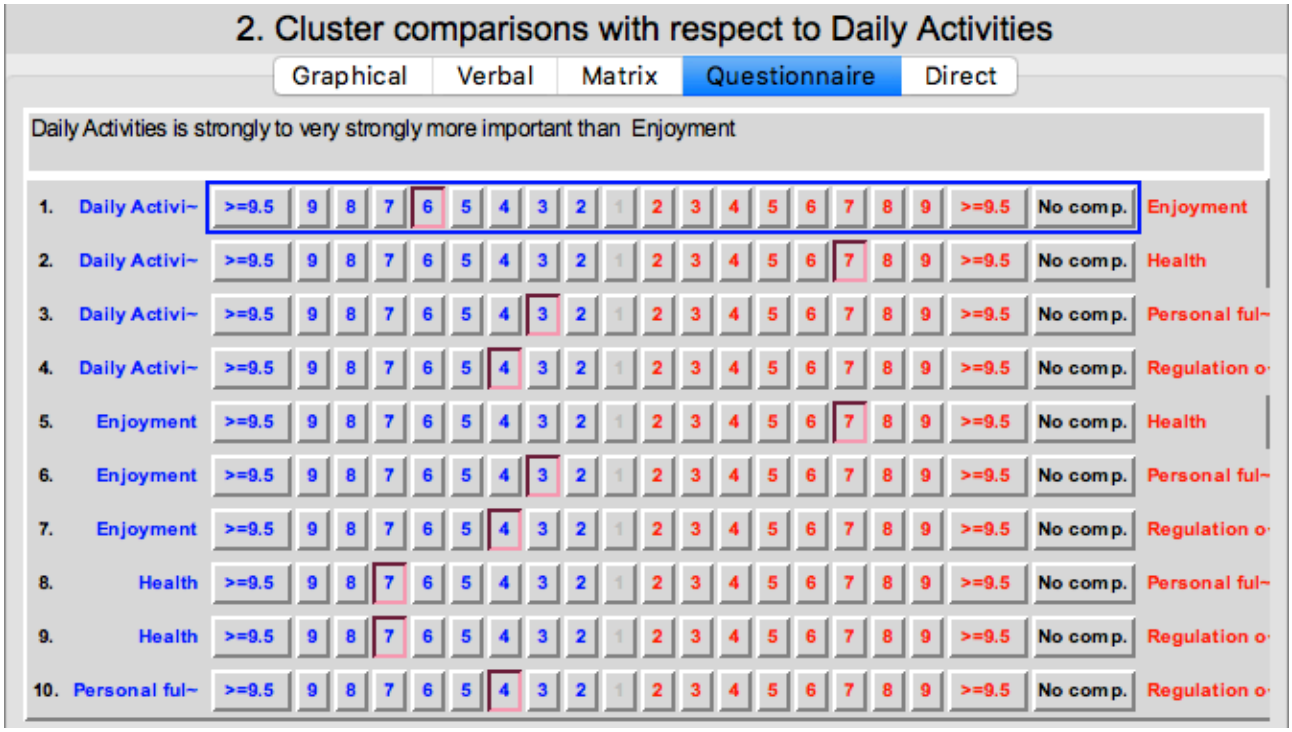
Assumed the alternatives, the actor preferences and the evaluation criteria, the decision-making problem has been structured according to the Analytic Network Process (ANP) method and with the support of “Super Decisions” software v.3.2 (SuperDecision, 2020).
The decision problem on the reuse has been tested on the alternatives for the Vela B.

Table 25. Supermatrix of Vela B reuse alternatives



The alternatives have been answers to the questionnaires on pairwise comparisons, considering the knowledge on technical issues and the preferences gathered from the different actors through interviews and surveys.


Network
Judgments
Ratings
Health
CS1 Physical he
CS2 Mental hea
Add Node...
Regulation of spatial structure
RM13 Connecti
RM14 Buffer di
RM15 Provision
Add Node...
Personal fullfillment
CS5 Way-findin
CS6 Scientific r
CS7 Didactic re
CS8 Spiritual ex
Add Node...
Daily Activities
P9 Place to live
P10 Place to wo
P11 Place to m
Add Node...
Enjoyment
CD4 Active enjo
CS3 Passive en
Add Node...
Vela B_Alternatives
A1 Institutional
A2 Place of soc
A3 Place of cult
A4 Place of spo
A5 Temporary H
Add Node...


2. Cluster comparisons with respect to Daily Activities
Graphical
Verbal
Matrix
Questionnaire
Direct
Daily Activities is strongly to very strongly more important than Enjoyment
1. Daily Activi~ >=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5 No comp. Enjoyment
2. Daily Activi~ >=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5 No comp. Health
3. Daily Activi~ >=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5 No comp. Personal ful~
4. Daily Activi~ >=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5 No comp. Regulation o~
5. Enjoyment >=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5 No comp. Health
6. Enjoyment >=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5 No comp. Personal ful~
7. Enjoyment >=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5 No comp. Regulation o~
8. Health >=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5 No comp. Personal ful~
9. Health >=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5 No comp. Regulation o~
10. Personal ful~ >=9.5 9 8 7 6 5 4 3 2 1 2 3 4 5 6 7 8 9 >=9.5 No comp. Regulation o~

	Pla ~ CD 4	Act ~ CS3	Pas ~ CS1	Phy ~ CS2	Men ~ CS5	Way ~ CS6	Sci ~ CS7	Did ~ CS8	Spi ~ RM	13 Co~ RM	14 Bu~ RM	15 Pr~ A1	Inst ~ A2	Pla c~ A3	Pla c~ A4	Pla c~ A5
P9 Plac~ 0.00000 0.00000 0.00000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
P10 Pla~ 0.00000 0.00000 0.00000	0	0	0	0	0	0.25	0	0	0	0	0.28112	0.05175	0.1 50 55	0.0 408 9	0.0 874 3	0
P11 Pla~ 0.00000 0.23659 0.00000 0.00000	0	0	0	0	0	0	0	0	0	0	0.09 371	0.10 35	0.0 30 11	0.1 226 8	0.4 371 5	0
CD4 Act~ 0.00000 0.00000 0.00000	1	0	0	0	0	0	0	0	0	0	0	0.05 09	0.0 29 62	0	0	0
CS3 Pas~ 0.13903 0.00000 0.13903 0.00000	0	0	0	0	0	0	0	0	0	0	0	0	0.0 29 62	0	0	0
CS1 Phy~ 0.80985 0.64625 0.40493 0.00000	0	0.2 5	0	0	0	0	0	0	0	0	0	0	0	0.1 712 2	0	0
CS2 Men~ 0.00000 0.00000 0.40493 0.00000	0	0.7 5	0	0	0	0.25	0	0	0	0	0	0.32 501	0.3 78 23	0.1 712 2	0	0
CS5 Way~ 0.00000 0.00000 0.00000 0.00000	0	0	0	0	0	0	0	0	0	0	0	0.10 496	0.0 81 43	0.2 211 8	0	0
CS6 Sci~ 0.00000 0.07637 0.00000 0.00000	0	0	0	0	0	0	0	0	0	0	0	0	0.0 81 43	0	0	0
CS7 Did~ 0.00000 0.00000 0.00000 0.00000	0	0	0	0	0	0	0	0	0	0	0	0.10 496	0.0 81 43	0	0	0
CS8 Spi~ 0.00000 0.00000 0.00000 0.00000	0	0	0	1	0	0.25	0	0	0	0	0	0	0	0	0	0
RM13 Co~ 0.03833 0.04079 0.03833 0.00000	0	0	0	0	0	0	0	0	0	0	0.23788	0.08284	0.1 03 19	0	0	0
RM14 Bu~ 0.00000 0.00000 0.00000 0.00000	0	0	0	0	0	0	0	0.75	0	0	0.04758	0.02 39	0	0.0 934 2	0	0
RM15 Pr~ 0.01278 0.00000 0.01278 0.00000	0	0	0	0	0	0	0	0.25	0	0	0	0.01 149	0.0 34 4	0.0 311 4	0	0
A1 Inst~ 0.00000 0.00000 0.00000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A2 Plac~ 0.00000 0.00000 0.00000	0	0	0	0	0	0.04167	0	0	0	0	0.33971	0	0	0	0	0
A3 Plac~ 0.00000 0.00000 0.00000	0	0	0	0	0	0.20833	0	0	0	0	0	0.11725	0	0	0	0
A4 Plac~ 0.00000 0.00000 0.00000	0	0	0	0	0	0	0	0	0	0	0	0.02345	0	0	0	0
A5 Temp~ 0.00000 0.00000 0.00000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A6 Comm~ 0.00000 0.00000 0.00000	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1 482 4	0.4 754 2	0

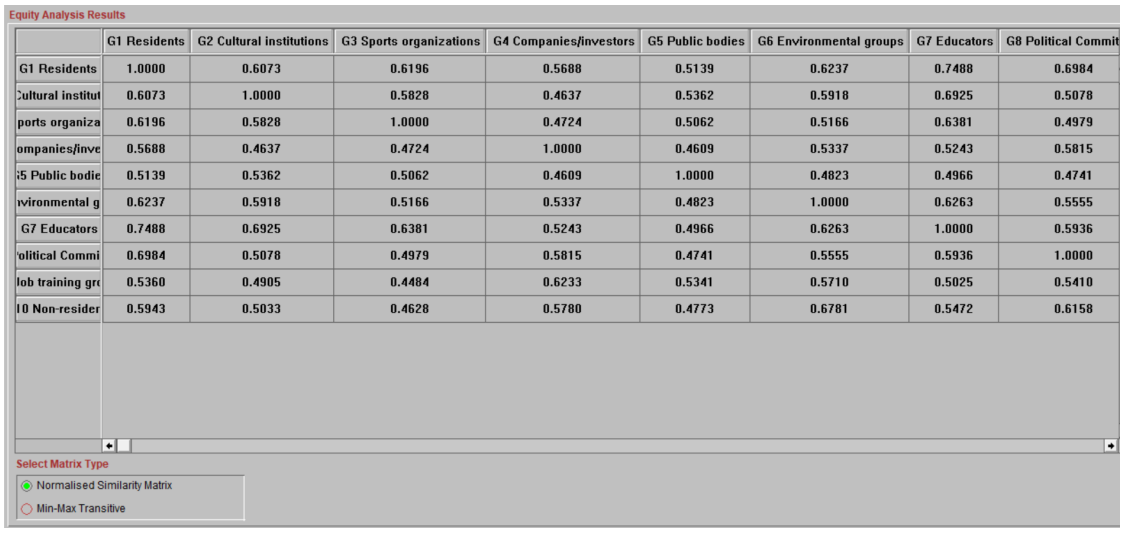
Name	Normalized By Cluster	Limiting
P9 Place to live	0.1683	0.035944
P10 Place to work	0.21995	0.046976
P11 Place to move	0.61175	0.130653
CD4 Active enjoyment	0.78442	0.124247
CS3 Passive enjoyment	0.21558	0.034146
CS1 Physical Health	0.4097	0.152856
CS2 Mental health	0.5903	0.220233
CS5 Way-finding	0.07071	0.008451
CS6 Scientific resource	0.10738	0.012834
CS7 Didactic resource	0.07066	0.008445
CS8 Spiritual experience	0.75126	0.089791
RM13 Connection of spaces	0.37711	0.022338
RM14 Buffer disturbing use	0.38458	0.02278
RM15 Provision of spatial complexity	0.23831	0.014116
A1 Institutional offices	0	0
A2 Place of sociability	0.0084	0.00064
A3 Place of culture and creativity	0.99128	0.075526
A4 Place of sports	0.00026	0.00002
A5 Temporary Housing	0	0
A6 Commercial Centre	0.00005	0.000004

Name	Ideals	Normals	Raw
A1 Institutional offices	0	0	0
A2 Place of sociability	0.008471	0.008397	0.00064
A3 Place of culture and creativity	1	0.991282	0.075526
A4 Place of sports	0.00027	0.000267	0.00002
A5 Temporary Housing	0	0	0
A6 Commercial Centre	0.000054	0.000054	0.000004

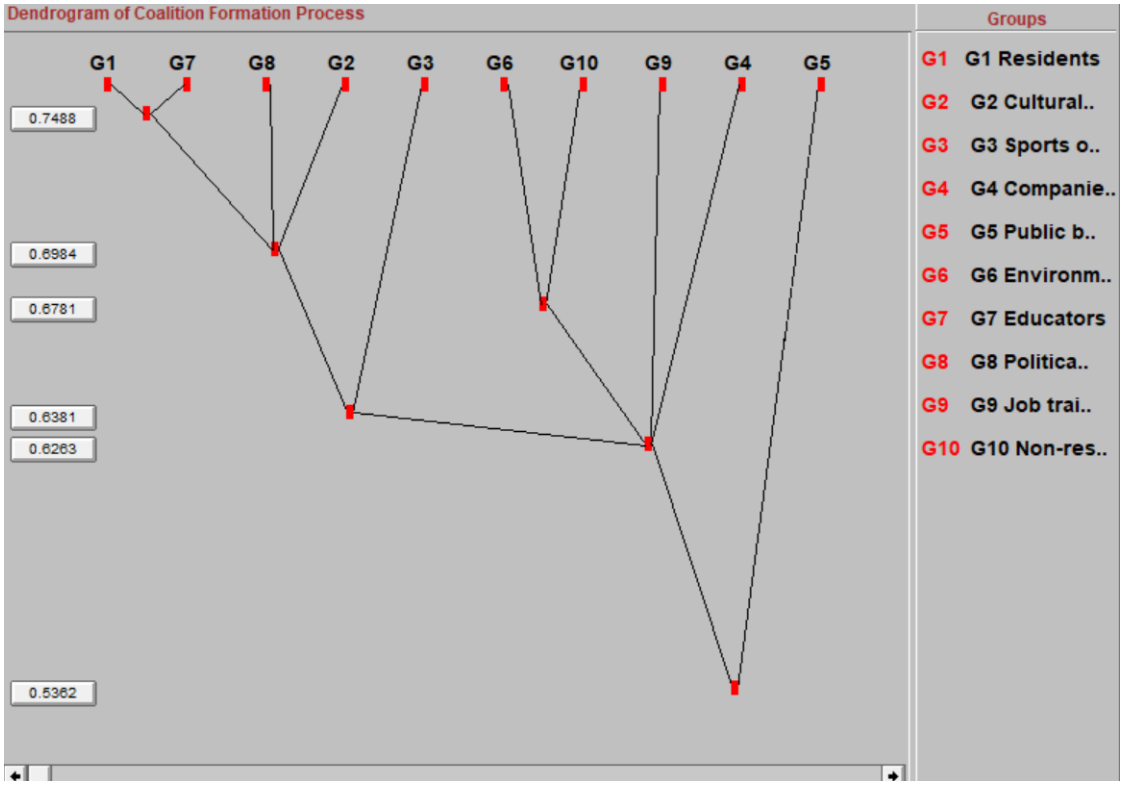
Priorities are physical and mental health.

5.5.3 The NAIADE multi-group analysis

The Novel Approach to Imprecise Assessment Decision Environment (NAIADE) method allows to set up a multi-group analysis to assess the coalitions of actors and stakeholders involved in the process, i.e. those who can concretely enable the actions of regeneration of the built environment. (Munda, 2006; Munda, 1995). The groups preferences are considered according to their identity and the preferences expressed.



	G1 Residents	G2 Cultural institutions	G3 Sports organizations	G4 Companies/investors	G5 Public bodies	G6 Environmental groups	G7 Educators	G8 Political Commit
G1 Residents	1.0000	0.6073	0.6196	0.5688	0.5139	0.6237	0.7488	0.6984
;ultural institut	0.6073	1.0000	0.5828	0.4637	0.5362	0.5918	0.6925	0.5078
ports organiza	0.6196	0.5828	1.0000	0.4724	0.5062	0.5166	0.6381	0.4979
ompanies/inve	0.5688	0.4637	0.4724	1.0000	0.4609	0.5337	0.5243	0.5815
;5 Public bodie	0.5139	0.5362	0.5062	0.4609	1.0000	0.4823	0.4966	0.4741
ıvironmental g	0.6237	0.5918	0.5166	0.5337	0.4823	1.0000	0.6263	0.5555
G7 Educators	0.7488	0.6925	0.6381	0.5243	0.4966	0.6263	1.0000	0.5936
olitical Commi	0.6984	0.5078	0.4979	0.5815	0.4741	0.5555	0.5936	1.0000
lob training gr	0.5360	0.4905	0.4484	0.6233	0.5341	0.5710	0.5025	0.5410
10 Non-resider	0.5943	0.5033	0.4628	0.5780	0.4773	0.6781	0.5472	0.6158



The dendogram of coalitions show that Residents and Educators have common points of view, also Political and Cultural groups, that prefer a place for sociability and culture open to citizens.

Conclusions

The Vele of Scampia wastescape showed some dynamics behind the abandonment and rejection phenomenon of this part of the city.

Following the Netzstad approach to study this wastescape, morphological and physiological components at different scales have been considered.

The morphological components were analysed at the different scales: building, lot and neighbourhood.

The social, i.e. physiological, components were considered at the neighbourhood scale and through the direct and precise experience of some local actors. The production of waste deriving from the demolition

of buildings and the transformation of the lot is also taken into account in order to consider circular solutions for the regeneration of the area.
At the centre of the Neapolitan agenda is a vision of the public city, collective uses and common goods. The Guidance Document of the Municipal Urban Plan of the City of Naples:
"In the northern area, on the other hand, the initiatives relating to the demolition of Vele A, C and D and the redevelopment of Vela B, and the forthcoming regeneration plan for the whole of Lot M, through 'Patto per Napoli' funding, have laid the foundations for the substantial redevelopment of the Scampia area, together with the process initiated with the State Property Office and the State Police for the construction of the citadel of legality in the area of the former Boscariello barracks[3]".
In 2015 and 2016, two crucial resolutions declared the civic and collective urban use of the Asilo Filangieri and the identification of seven spaces of civic importance ascribed to the list of everyday goods. These resolutions have received significant recognition for their ability to 'restore a constituent potential to collective subjectivity.
In line with the urban policies of the City of Naples, how the Vela could be reused? A multicriteria and multi-actor decision process using ANP and NAIADE show that a collaborative process based on multiple actor preferences can open different complementary scenarios.
The process of Scampia social regeneration, not only urban but also human (as Davide Cerullo argues talking about the need for a new humanism), puts at the centre the individuals who have been for decades wounded and damaged by a condition of marginalisation, abandonment and degradation in this place. The desires for the well-being of the inhabitants are confronted daily with the city's image, with the Vela image.
While the people of Scampia urgently need work, they also need beauty, culture and confidence, like the New Bauhaus Movement is recently stating.
In the case of the high-density residential buildings of the modern movement, architecture has not produced the material and immaterial values (Vecco & Fusco Girdard, 2021) that it wanted to be the bearer of.
The regeneration conditions of Scampia and the Vela highlight the possibility of giving rise to that collective urban life imagined by Di Salvo according to the modernist utopia. Today it is clear that it is not the form of architecture that is the solution or the problem, but that social and metabolic dynamics determine the fate of the built environment and that decision-making processes must be collaborative to create interest, belonging and civic sense, i.e. the care that guarantees self-regeneration and sustainability over time.
Wastescapes can be regenerated by recovering all material and immaterial waste through horizontal, open and adaptive processes. From the analysis of the Vele wastescape, it emerged that the polarisation of the stigma on architecture and prejudice in the definition of the external perception of rejection (wastescape) of the neighbourhood has prevailed over the waste resources of Lot M + the potential of Vela B and the existing resources in the local community (associations and citizens).
Youth unemployment, a problem, is a vast human resource for those who want to invest in new activities in the neighbourhood because these young people are looking for work. The new redevelopment project through the transformation of Vela B and Lot M through circular reuse opens up the possibility of a socially inclusive perspective. A final open question for the future: Could the Vela B become a common good? If yes, this possibility would open another phase for Scampia.

3 The former Boscariello barrack is located in Via Miano, about 2 km from Lot M od Scampia.

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6 The Bijlmermeer, Amsterdam

6.1 Introduction

The case study of Bijlmer is a fascinating case of wastescape regeneration. It is even more attractive compared to Scampia because starting from the same urban modern settlement concept, the story of Bijlmermeer can be compared to what is happened in Scampia. Also, Scampia can learn from the Bijlmermeer a regeneration process in a very advanced phase.
The case study of Bijlmermeer regeneration focuses here on the analysis of the K-buurt. The lots of this part of the neighbourhood correspond to the lots where the modern architecture has been restored and reused.
Most of the Bijlmermeer changed entirely over the years through massive demolitions and reconstructions and new functional planning. The evolution of the neighbourhood is fully explained by Wassenberg (2013).
The Bijlmer Monitor 1994-2009 analysed the socio-economic evolution of the area (Terpstra, de Kleuver, & van Soomeren, 2010). Since 1994 to 2009, the population of the renewal area has fallen by more than 15%. This development contrasts with that of Amsterdam; there has been an increase of 5% in the last 14 years.
Compared to the city, the Bijlmermeer has many children and young people (up to 24 years), adults (40-54 years) and few young adults (25-39 years) and older people (from 55 years). In the Bijlmermeer, 15% of the population is of Dutch origin. Relative to the city, there are many Surinamese, Antilleans and people from other non-Western countries. Also, Turks, Moroccans and people from other Western countries live there. A relatively large number of single-parent families and relatively few people living alone live in the Bijlmermeer. The total number of homes in the renewal area fluctuates due to the demolition and new construction of homes. However, the total number of homes has decreased compared to 1994. The number of privately owned homes has increased further.
The number of homes in the former Nieuw Amsterdam is declining.
The average duration of living in the Bijlmermeer has risen slightly since 2007. However, it is still below the Amsterdam average. The number of people leaving the Bijlmer is as high as, or lower than, the number leaving the average Amsterdam neighbourhood.

The average number of people leaving as a percentage of the total number of residents is still slightly higher in the Bijlmermeer than in Amsterdam. However, the difference between the Bijlmermeer and the city has narrowed considerably over the study period. The number of households in the Bijlmermeer

that are planning to move is as large as, or smaller than, the number of households elsewhere in the city.
The percentage of residents with plans to move has fallen sharply in the Bijlmermeer and is now just as high as Amsterdam. However, there are slightly more residents in the Bijlmermeer who want to move.
The number of housing applications for the Bijlmermeer is as high as, or higher than, the average Amsterdam neighbourhood. The average number of reactions to houses in Zuidoost has increased considerably but is still lower than in Amsterdam.
The average waiting period in Zuidoost and Amsterdam is starting to come closer together.
The image of the Bijlmermeer in the press is less harmful.
In 2009 articles with a negative slant were again the largest group in the
coverage of the Bijlmer. The number of positive articles increases, however, and is the largest since 1995.
The opinion of Bijlmer residents about their neighbourhood is at least as favourable as the opinion of other Amsterdammers about their neighbourhood.
The opinion of the residents of the Bijlmermeer of their neighbourhood has improved compared to 2005. There is still a difference with Amsterdam, but that difference is getting smaller.
Satisfaction with living and housing in the Bijlmermeer is equal to or higher than the average in Amsterdam.
In 2009 the residents of Bijlmer were just as satisfied and sometimes more satisfied with some aspects of their home than the residents of Amsterdam.
Between 2003 and 2009, the residents of Bijlmer have become more optimistic about their living environment. However, the gap with Amsterdam remains.
The satisfaction of the Bijlmer residents with the physical living environment is just as high as the Amsterdam average.
The Bijlmermeer feel as safe as, or safer than, the average Amsterdammer in the public space.
Satisfaction with neighbourhood amenities shows a mixed picture, but in general, satisfaction with most neighbourhood amenities has increased. The difference with Amsterdam has narrowed.
The satisfaction of the Bijlmer residents with the social living environment is just as high as the Amsterdam average.
Satisfaction with the social living environment - how people live together - is subject to fluctuation during the study period. Satisfaction declined sharply in 2009 in both the Bijlmermeer and Amsterdam.
For the first time since 2005, residents of Bijlmer are less satisfied with the social living environment than Amsterdam residents. The involvement in the neighbourhood and satisfaction with the maintenance and cleaning of the public space increased in both the Bijlmermeer and Amsterdam between 2005 and 2009. The gap with Amsterdam has narrowed.
Due to the lack of proper operationalization, this sub-goal cannot be measured.
Intervention in the road system: several roads ('lanes') will be brought to ground level. Net that will result in the same area.
All intended lanes have now been brought to ground level. The sub-goal has therefore been achieved.
Satisfaction with the home and living environment in the renewal area is equal to or higher than the Amsterdam average.
Juvenile delinquency is falling to the Amsterdam average. Up to and including 2007, the Bijlmermeer stood out compared to the Amsterdam region. Amstelland is always unfavourable. The number of detentions of juveniles decreased sharply in 2009, and the difference with the region narrowed considerably in 2009 for the first time during the investigation period.
Road safety and the feeling of road safety are higher than, or at the same level, as in Amsterdam.
In the past, the sub-target about the feeling of road safety has already been amply achieved. In all editions of the monitor, the Bijlmer scored better than Amsterdam.
The Bijlmermeer feel just as safe as, or safer than, the average Amsterdammer in public space.

The residents of the Bijlmermeer have started to feel safer both in the evening and during the day. The difference with Amsterdam has thus become smaller.
The residents of Bijlmer indicate just as often as Amsterdam residents that property crimes occur. Incident threats and youth nuisance are more common in the Bijlmer than in Amsterdam.
The average perceived deterioration in the Bijlmermeer has decreased and is now lying almost on the city average.
The perceived drug nuisance has decreased significantly in the Bijlmer. Still, considerably more nuisance is experienced in the Bijlmermeer than in Amsterdam, but the gap has narrowed.
The whole safety situation in the Bijlmermeer is at least equal to the Amsterdam average.
The overall security situation has improved in the renewal area. Police figures show that objective safety in the Bijlmermeer has improved, narrowing the gap with Amsterdam. Residents in the Bijlmer also experience property crimes and deterioration to the same extent as in Amsterdam. The perceived incident threats in the Bijlmer continue to contrast unfavourably concerning the city. The same applies to drug nuisance, with the note that it has decreased significantly in the Bijlmer.
The unemployment rate in the Bijlmermeer is the same as that in Amsterdam. The unemployment percentage has been in the Bijlmermeer since the beginning of the
search period has fallen sharply. However, in 2009 the unemployment rate in the Bijlmermeer was still higher than in Amsterdam.
The distance to the labour market of the Bijlmer residents is the same as that of other residents in Amsterdam. Compared to the Amsterdam average, the distance to the labour market in the Bijlmermeer is greater. The percentage of NWW-ers who need a lengthy mediation process is higher in the Bijlmer than in Amsterdam. There are also twice as many households in the Bijlmer that receive social assistance benefits.
The income situation of Bijlmer residents is the same as that of the average Amsterdammer.
The average net monthly income has increased in the Bijlmermeer but is still considerably lower in the Bijlmermeer than in Amsterdam. A relatively large number of people from the lower-income class and relatively few people from the higher income class still live in the Bijlmer.
The social and financial-economic position of the Bijlmer residents is the same as that of the average Amsterdammer.
The social and financial-economic position of the residents of the Bijlmermeer is less good on all the indicators mentioned than the city as a whole. The gap between the Bijlmer resident and the average Amsterdam resident has narrowed regarding the unemployment rate. Nevertheless, in terms of distance from the labour market, the gap has widened again in the past year.
The educational offer is increasing. The educational offer in the Bijlmermeer has not changed significantly. Things have changed outside the innovation area, with the arrival of the High School for Economic Studies and part of the ROC Amsterdam.
The number of early school leavers in secondary education is equal to or lower than the Amsterdam average.
The primary schools in the Southeast usually do slightly less well than the other Amsterdam primary schools. This difference increased in 2009.
The educational level of residents of Bijlmer is at least equal to the Amsterdam average.
The level of education in the Bijlmer is increasing.
Since April 2020, the city of Amsterdam has adopted the Doughnut Economy model for the implementation of actions and strategies for the circular city (Circular Amsterdam, ...). Collaborative planning of urban transformations has proven to be a critical issue. From an interview, Architect Flores Torche stated that the management of Heart von K-buurt's participation in the densification project of the plot was very complex and led him to give up work. In contrast with the community of the E-buurt complex, the participation process was constructive and fast. Living labs, or participatory workshops,

gather community input. When there is no discourse of community but personal interests, collaboration is impossible.

Learning to overturn points of view and be self-critical and that issues are of common interest. Reversing points of view. Also, uprooting the preconceptions one carries around. It is about building a road.
There are various dynamics in a co-planning process, and if roles and rules are not established it becomes difficult to compromise. They are enabling conditions.

6.2 The K-buurt in the Bijlmermeer: from wastescape to protected cityscape

Wassenberg studied intensely the issues related to high-rise buildings considering the case of Bijlmermeer. Like in Scampia, Bijlmermeer was a wastescape because of some issues due to the main principles of the modern settlement. Halleman & Wassenberg (2004) point out three main groups of problems:

1. Functional: the unfinished condition of the neighbourhood, due to the absence of services;
2. Design: Liveability of spaces was not guaranteed for uncontrollable semi-public space, and collective spaces entrance became places of rubbish degradation, vandalism, and then lack of safety;
3. Housing market: The supply and demand did not match because of the typology, the monotony of the building aesthetic.

The buildings in Bijlmermeer designed by Sigfried Nassutt were intended for the middle class, but they were emptied after a first habitation phase. Later they were inhabited by migrants from Surinam and

other non-European countries. These people formed communities over the years, and today the multi-ethnic character of the neighbourhood distinguishes it from others.
The modern buildings in K-buurt are social housing and five of the six are managed by Roshdale: Gooioord, Groeneveen, Grubbehoeve, Kikkenstein, Kruitberg. These buildings have been renovated but retain their original shape and structure. From an interview with Rochdale (2020) emerged that:

> *On average, the Bijlmer is doing better than in the past. However, if you look at a smaller scale (neighbourhood level), the classical Bijlmer high-rise is doing much worse than the neighbourhoods that are renewed in the period 2000 – 2012 (these neighbourhoods have a better mix of social housing, owner-occupied homes and free sector rent.). The Bijlmer flats (high rise) in the Bijlmermuseum (even Kleiburg!) have a bad livability.*
> *The flats Geldershoofd en Gravestein (G-buurt Noord) are our most problematic flats. We are going to regenerate them (start in 2023 till 2025).*

The case of Kleiburg is different is object of the next Chapter.
The public space of K-buurt has a quiet and serene atmosphere, like an urban park. Apparently empty, the inhabitants quietly live in the public space. Visits to the site occurred during the months of the first and second wave of COVID-19, so many activities were closed and the streets less populated than usual. However, several groups live outside for barbecues, walks and sports, and the area around Kleiburg is vivacious due to a community garden and facilities for sports and children. The elevated metro line over the modern structure is the monumental element of the neighbourhood, cutting it in half without producing discontinuity at ground level. The presence of The Growing Monument is a reminder of the 1994 aeroplane crash that killed 42 residents. In addition to the war memorial designed by Herman Hertzberger, Georges Descombes, Akelei Hertzberger, Dickens van der Werff, Julien Descombes, Cor Kruter, Ariënne Matser, Colette Sloots and Jolanda van der Graaf, the whole area is full of sculptures and murals on the buildings.

Open-air living in Bijlmer.
Chairs in the grove of the Bijlmermuseum area during the COVID-19 social distances. October 2020.
Photo of the author

The semi-public space of the buildings was dangerous for a long time: the garages in particular.

Photo 13. Bijlmermeer A. Parkeergarage. Collectie: Archief van de Gemeentelijke Dienst Volkshuisvesting: foto's F-serie. Source:Amsterdam photo archive.

An interview with Daan Dekker (2020), author of “De betonnen droom”, confirmed that the Bijlmer community has a strong sense of belonging, that pushed the process of reconnaissance of the historical value of the area, and they carry out several neighbours’ activities along years. Another crucial point is the Bijlm current participation in planning. The group “Hear von K-buurt” is playing a role in the open masterplan of the area (Mr Troche, 2020). The community that saved many parts of the original modern buildings and structures is now active in the participation and collaboration in spatial planning process in the Bijlmermuseum but they have a very strong idea of the image of the future buildings, that does not match with the necessity of densification of the area.

The case of the **Bijlmer Spinoza Festival** is meaningful in the use of public space and community involvement. Swiss artist Thomas Hirschhorn was the author of the Bijlmer-Spinoza Festival in 2009.
Hirschhorn built a wood architecture open to the people of the neighbourhood for two months.
In the K-buurt locals, the Amsterdam Zuidoost Food Forest is taking a significant part of the green public space.
A 55-hectare area is now being designed, realized, and cared for by a group of active local people. The group includes young and older people from different backgrounds. They are a place-based community, but together they form a “*community of practice*” that practices *gardening, permaculture, agroecology, regenerative agriculture, technology, urban landscape maintenance, management, sewing, cooking, and food conservation techniques, but also marketing and communications, art, sports, education, and neighbourhood history* (Solomon, 2020). This community of practice support the food forest project when many hands are needed and create *glue value* between people of the neighbourhood.
The Urbaniahoeve project of Debra Solomon has also been presented as an example of “Who are We?” in the Dutch pavilion at the Biennale of Architecture of Venice 2021. The *We* is made by the people but also by the environment. The *We* are also the reunification of the man with his environment, a natural part of the urban public space. This community coming together and reconciliation takes place through the meetings, collaborating and working towards common goals.

6.3 Kleiburg: The case of reuse of a modern wasted building

Massive investment in redevelopment in Bijlmer started after the disaster of 1992, when El Al cargo plane crashed into Kruitberg and Groeneveen buildings. In the point of the tragedy today the Growing Monument commemorate the 43 victims.
Of the 31 original honeycomb buildings, only seven remain today, including six in the area of the Bijlmermuseum in the K-buurt: Gooioord, Groeneveen, Grubbehoeve, Kikkenstein, Kriutberg, and Kleiburg. Other elements of the original project by Siegfrid Nassuth the elevated road currently serving the metro line, some garages and the public park. Currently, there is no redevelopment or big transformation of space taking place in the area. The history of the K-buurt tells the story of the transition from a wastescape to a recognised cityscape and protected, the Bijlmermuseum since 2016.
The last decade has marked several interesting moments in the history of the last original Bijlmermeer fragment. The Bijlmer-Spinoza Festival of the artist Thomas Hirshhorn took place in the middle of K-buurt in 2009, conceived for and with inhabitants in the public space joining of a work of visual art with a series of activities like philosophy conferences, open reading zones and theatre and creative activities for children. The same year, the Grubbehoeve renovation of was awarded wuth South-East Architecture Prize.
In 2009, Rochdale had decided to demolish Kleiburg, the last original and vacant building of Bijlmer whose renovation was estimated to be too expensive. However, the Bijlmer pioneers opposed the demolition by requesting that the last remaining original honeycomb flat building was preserved. Rochdale then let the building for the symbolic price of €1 to the DeFlat Consortium, thus also saving

the demolition costs. Using the Do It Yourself (DIY) formula, Consortium DeFlat found the solution to restore the building at an affordable price and managed to sell all the flats. In 2017, NL Architects and XVW Architectuur's restoration project of Kleiburg won the Mies van der Rohe Award. It was the first time for a collective housing project. Revamping social housing also led to the prize in 2019 for the transformation of 530 dwellings as a renovation of three 1960s housing blocks in Bordeaux. The architects of the XVW and NLarchitects studios, through some minimal solutions to improve the functioning of the building and the relationship with the public space on the ground floor, have revived the last modern building with an essential renovation operation. Thanks to Dutch legislation, however, it was not mandatory to meet many of the sustainability performance requirements that are imposed on new buildings today.

This made it possible to bear the expense of the renovation and save the building, but the environmental impact of the building would need to be investigated in order to assess its environmental sustainability over time. The new residents who own Kleiburg have formed neighbourhood ties and take care of an urban garden in the neighbouring public space. A chapel, the Kleiklooster, has also been established in the building, from which a brewery Brouwerij Kleiburg, with a community place and restaurant in Bullewijk, has also sprung up. Hybrid community of place are a collection of people in contact with each other in the physical and virtual worlds, who also share a concern for a place (the one in which they live and/or the one towards which they have a particular interest) and who, precisely because of their hybrid and embedded nature, can operate as resilient communities (Manzini, 2020).

The multicultural Communities of Place are a vital component of the K-buurt identity. While Kleiburg was being completed, the cultural-historical significance of the area was recognised with the Bijlmermuseum, a protected cityscape where both public space, the trees, and the original buildings and remaining infrastructure constitute an urban environment to which many are attached.

The regeneration operation of the building is a successful case of adaptive reuse (Polano, 2018):

The cultural impact of today the area surrounding Kleiburg is the liveliest in the area.

Conclusions

From this case study, we were able to identify some significant regeneration processes that led to the improvement of the Bijlmer K-buurt area. This plot in Bijlmermeer is significant because the original modern architecture is present, and the configuration of the public space is similar to the original one. Today the uses are slowly changing. The buildings are managed by Rochdale as social housing, while Kleiburg has had a different process of conservative restoration and reuse. The case of Kleiburg shows that modern architecture can be recovered and regenerated with excellent results, demonstrated by the sale of all the housing units. The unfavourable socio-economic conditions are slowly improving throughout the district. The inhabitants of Bijlmer have evolved from a community of place into a community of practice, primarily by fighting for the protection of the modern architecture that characterises the neighbourhood and caring for their public space between buildings. Many events marked the process of regeneration and re-appropriation of the neighbourhood. As part of the transition to circularity, Amsterdam's city is adopting the *doughnut* economy model. In this model, Living Labs as a tool for collaborative decision-making emerged from Bijlmer experiences. Collaborative processes, however, are not simple. Interviews revealed that the municipality is facing difficulties in densification of plots bordering the K-buurt due to objections from "Heart von K-buurt" groups of inhabitants. The co-planning process is ongoing.

Similarly, in plot E, in a modern honeycomb complex, the co-design process with the inhabitants has been smooth. The K-buurt area is predominantly residential, with public services, supermarkets, convenience stores, beauty salons, and offices. The tremendous urban potential is in the vast, quiet green public spaces between the buildings. The Urbaniahoeve project led by Debra Salomon is a growing community of practice that is working in the K-buurt on creating an urban forest.

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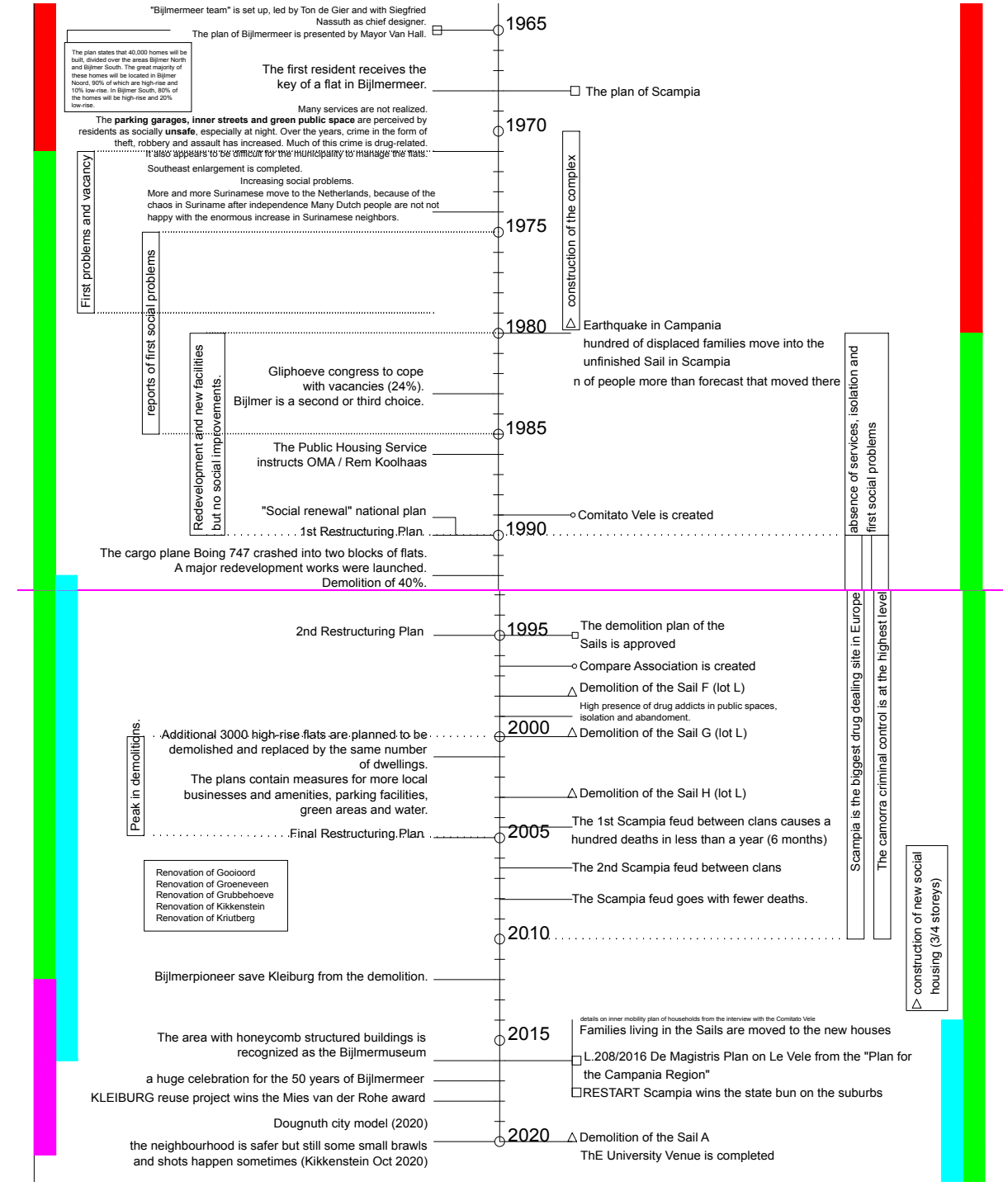
7. Lesson learned from Scampia and Bijlmermeer. Discussion and conclusions

In the 1960s, many suburbs of Europe's major cities were built in response to population growth.
Like many others in Europe and U.S., the districts of Bijlmermeer and Scampia were both born with similar assumptions: Megastructure design according to the principles of the Modernist Utopia to cope with increasing housing demand. The modern architects dreamed of creating an egalitarian collective lifestyle for inhabitants, according to CIAM's principles, designing high-rise buildings, big public spaces with public green areas and communal facilities.
A result of modern planning and design systems of a large housing estate, these parts of cities were not immediately absorbed by the existing fabric, and gave rise to phenomena of segregation and social exclusion, which led to scenarios of social and environmental degradation. Both districts had common problematic developments from the very beginning, albeit eventually they experienced different events. Many incremental problems in time lead to their failure, i.e. the budget limitations that led to unfinish the facilities, the architecture typology, the isolation due to the lack of connections with the city centers, the cutting-edge aesthetic that did not like to people, and the concept of modern architecture based on utopic ideas of a daily life far from what people wanted.

	Bijlmermeer K-Buurt	**The Vele of Scampia**
First project	1965	1966
Final project	1972	1968
Construction years	1965-1974	1970-1980 (unfinished)
Distance from the central station	Approx. 12 Km (20 min by metro, 20 min by car)	Approx. 10 Km (1h public transport, 20min by car)
Original buildings (number)	30	7
Built for	Middle-class	Low-income
Used for	Residential and other functions	Currently squatted
Floors	9	14
Building Typology	High-rise buildings (condominium with accesses from balconies)	High-rise buildings (condominium with accesses from balconies)
Flats	13000 or 14000 (all the district)	956 (640 in the Lot M + 316 in the Lot L)
Communities	Suriname, dutch Antilles, ethnic minorities (today 80%, not originally Dutch)	Italians, Roma
Main problems in time	Unfinished because of cutbacks, vacancies, safety, pollution, nuisance, robberies and degradation	Unfinished because of cutbacks, squat, safety, pollution, nuisance, robberies and degradation
Demolitions		1999-2000 The three buildings in the Lot L 2020-ongoing the building A has been demolished (feb-july2020). Sal C and D will be demolished.
Inh of all the district (year 2020)	50000 inh	40000 inh

Same planning background in different cities caused segregation and ghettos, where different socio-cultural phenomena led residents to similar conditions and problems that transformed the districts in no-go zones.
Renewal of Bijlmer high-rise carried out over time have involved the demolition and reconstruction of some of the buildings, the construction of new public spaces and the completion of street furniture, a social renewal that has led to a reduction in unemployment rates and better control over crime, with the aim of facilitating the economic development of the area.
Bijlmermeer today is a lively, multicultural neighbourhood and part of the city of Amsterdam's extensive circular economy programme. Participants in the decades of renewal policies were the Municipality of Amsterdam, the district, the Dutch public housing authority, private operators and groups of inhabitants.
The Neapolitan district of Scampia is now in a profound transformation process. However, it has not yet reached levels of economic well-being for its inhabitants, such as to redeem it from the stigma it carries. After the first ten years of overcrowding and squatting, since the 1990s, Scampia has been a symbol of drugs, criminality and marginalisation. In fact, Scampia was the biggest drug dealing place in Europe until about ten years ago, and today the problem is still not completely solved. In the mid-1990s, the buildings were declared unfit for human habitation and were therefore abandoned and not maintained by the public administration. The inhabitants organised themselves to provide the essential services for living, but with great inconvenience. A strong criminal control of the areas decreased along last years, but further and complex investigations would be required to clarify the current influence of this agent in the urban transformation dynamics. In the last ten years, the district has been experiencing a phase of regeneration through the action of many local NGOs and socially active groups in the area. The Municipality of Naples realised public works to improve the district, infrastructures, green care and a demolition and redevelopment plan.
Beyond the temporal asymmetries in regeneration policies, the main big difference in the two areas is in the approach of public administration and the residents to the conservation or demolition of the buildings. Urban regeneration processes affected both the physical environment and the socio-economic conditions of the areas and involved public administrations residents and users. While public administration played a crucial role in macro-scale planning and new developments, residents' willingness creates conditions for the bottom-up community actions that aim to improve inhabitants' daily lives. People involvement and strong connection with their neighbourhood, determined also the fate of some spaces and modern buildings conservation or demolition.
In the perspective of circularity, planning policies, built environment and social dysfunctions shaped waste areas and wastescapes, as unresolved territories procuring ecosystem disservices and risks for the environment, economy and society. Multiple dimensions of wasted areas have a regenerative potential.
Bijlmermeer and Scampia were born from a firm idea of the city and residential architecture typology that immediately defined a new urban landscape image. These iconic landmarks have polarised the debate, and even if they did not work, their strong identity was blamed for producing all the social issues of the neighbourhoods, obviously caused by many different immaterial agents. Although relationships between spaces and inhabitants define a neighbourhood, the synergy with the rest of the city and the socio-economic conditions of the employment opportunities offered to the inhabitants make a difference.
In both Bijlmer and Scampia, areas where the original architecture has been completely modified, have taken on a new urban identityScampia and Bijlmermeer comparison let find affinity and differences of two neighbourhoods born in two very different and far cities but based on similar architectural and cultural context. Both cases show the gap between the expectations of planners and architects who built these modern utopias and the reality.
The two suburban neighbourhoods are part of very different and distant cities in Europe, but they result from the same modern utopia with no expected results. Because they had the same initial conception

in part a similar story, the problems generated from modernist utopia architecture and social segregation have influenced each other.



Bijlmermeer was a *wastescape*, but today it is not anymore. In July 2016, the original part of the Bijlmermeer, the K-buurt, has been declared **protected *cityscape*.**
Currently, the Vele of Scampia area is still a *wastescape* of the north area of Naples, but the neighbourhood is under profound transformation.
Bijlmer today is a multi-ethnic, vibrant and safer district. Scampia is multi-ethnic, vibrant, but still not safe.
In this sense, Scampia could *learn from Bijlmermeer* by understanding what have been the key elements of the regeneration of this area. In both cases, buildings and society have been subject to stigma.
In Bijlmer, we can study which actions led to the current improved condition. In Scampia, the changes that have taken place so far have benefited the neighbourhood. Each City is in permanent evolution.
The Vele buildings assumed a level of degradation and such a negative iconic connotation that the symbol has become a paradox: the inhabitants representing them with pride and affection are the same fighting for their demolition.
In the case of Bijlmer, the regeneration process of the neighbourhood has been faster since the early 1990s, through massive demolitions of the original buildings, garages and elevated infrastructure. Here, however, having been guaranteed decent housing and having had profound architectural and urban works for regeneration, the area's place communities have prevailed on the strong link with the history that those buildings represent.
The two cases of regeneration processes show remarkable affinities in the problems and divergences in the response.
The processes in place for circular urban regeneration, development of regenerative and self-regenerative capacity.
The study shows that the local communities of the Bijlmermeer and Scampia neighbourhoods have initiated bottom-up urban regeneration processes on two main fronts:
1) social: through sharing and cooperation to make up for absent services,
2) environmental: re-appropriating the city by taking care of small semi-public areas.
In the transformation processes of the built environment, many conflicts arise concerning the management of the architectural heritage.
Important components of bottom-up wastescape regeneration in modern neighbourhoods are the communities of place and the communities of practices. They keep using wasted spaces as resources to create glue value. Small circular economy activities are also practices, and even if they do not make a massive difference in terms of material balance (MFA) of waste metabolism, they generate non-use values and social cohesion and trigger other incremental urban regeneration processes, economy and cooperation. A qualitative approach to studying these cases is preferred to explore the intertwining of wasted architecture with conditions of social marginality, rejection and exclusion.
The evolution of the concept of *heritage* as material and immaterial value (Fusco Girard & Vecco, 2021; Vecco, 2010) emerges from the Bijlmer's inhabitants' struggles, who saved some buildings from demolitions and recognised the area's heritage value.
Today, the circular city model seems to be implementing the modernist utopia of a collective, healthy and democratic urban life in making a city and not responding to a need with a fast and finished top-down project.

Part V Epilogue

Discussion and open conclusions

The research carried out has tried to broaden the knowledge of wastescape which enriches and supplements the studies carried out in recent years in the field of scientific research on the subject, in the path of the investigation developed in the Naples case of the h2020 REPAiR project.
The main objective has been to further explore this new research strand by identifying values, approaches and tools for their regeneration in the direction of a transition to Circular City (CC) models.
The basic hypothesis is consistent with the principles of the Circular Economy (CE): Waste is considered a resource for CE and CC. In this perspective, wastescapes are resources for urban regeneration. The wastescape is read as a cultural landscape, thus multidimensional. Waste is not an entity but a condition that is the product of a cultural choice, also according to the official European definition of *waste*. When we think about waste we first think about material waste. But also space, land, buildings and the built environment can be wasted in current economic processes. A wastescape is not only related to the spatial dimension, in which it takes place.
Bauman (2004) talked about *wasted lives*, when he considered all the outcasts of modern society. The cultural dimension and the multiple nature of urban waste, lead this research to broaden the concept of wastescape as a multidimensional cultural landscape made up of a system of waste. The European Landscape Convention (2000) emphasises the role of local communities in landscape assessment, defined as "the portion of territory, as perceived by populations, whose character derives from the action of natural and/or human factors and their interrelationships".
The waste and wastescape considered in this research are both material and non-material. They form the *cultural landscapes of waste*: a place of waste systems, like urban metabolism of waste, wasted built environment, abandoned architectures, and outcasts.
The main research question: (1) **What values, approaches and tools can guide the regeneration of a wastescape to move toward a circular city model?** and, also, (2) **how to do it?**
The research path explored the topic through theoretical and field studies at different scales.
The **Part I** of the study contextualises the research questions in relation to the theoretical frame of reference. The cultural background is the perspective from which this study is developed.
To answer these broad questions, the wastescape concept has been firstly framed in the literature, than explored in field research. The research topic is recent, but stems from the intersection of two vast research fields from waste lands to drosscapes. In the REPAiR project innovated this kind of investigation starting from the concept of *resource management*, and *going beyond urban metabolism.* Opening the black box of metabolic flows by spatializing them with maps, REPAiR combined the UM with the map of *wastescapes*,
The hypothesis underlying the research is that wastescape regeneration is an asset for circular city.
While the circular economy concerns production chains and everything related to resource management, the CC declines in the territorial and spatial sphere the principles of the circular economy.
The **Part II** defines the wastescape theme and the reference elements to build an evaluation process aiming at regeneration. Three systems of significant waste elements in the urban landscape have been identified: urban metabolism, the built environment and social systems. So the urban landscape contains wastescapes, but in this interpretation it cannot be a wastescape itself.
Wastescapes are defined in Section 2. The wastescape evaluation is the subject of Section 3.
Circular economy is paradigm that would allow much benefits, but it need to be complemented with the equitable distribution of resources and environmental justice policies.
At the regional or intermunicipal scale, circular economy produce new values, but not directly urban regeneration.
The **Part III** cope with the case study of the Naples focus area in the REPAiR project. This case study is a bridge between theoretical and field research. In fact, the wastescape theme was born and explored within this project.
In the REPAiR project wastescapes were studied according to their spatial categories. Following the interpretation developed in this research, the maps of waste areas (drosscape and operational

infrastructure of waste) were not considered as wastescapes, but the system of metabolic flows of urban metabolic waste. This system constitutes a wastescape in the study area of Naples. Indeed, waste is a problem and a heavy burden in the Campania Region. Undisposed eco-bale dumps (waste stock) cost the region a huge penalty per day. The flows investigated are CDW and OW. The plants recovering inert demolition waste have no market, and the construction materials chain is not circular, but still mainly linear. Biogas and composting plants are not yet perceived as a local resource, and are even opposed by the local population when an area for one is identified.

At the inter-municipal scale, the issue of wastescape with respect to the circular economy and the circular city mainly concerns the management of waste metabolic flows. The issues are administered at regional and local scales. Although regional policies indicate actions for the circular economy, municipalities and private stakeholders have the real control and capacity for action to implement circular economy strategies. Obstacles and impediments are of various nature, but the two main problems in closing loops seem to be cultural and legal. In fact, people have a relationship of rejection towards waste, waste treatment plants and scepticism about recycled products. From a legal point of view, the End of Waste decree would unblock many obstacles in industrial synergy operations.

The **Part IV** of the study compared two case studies of wastescape on a neighbourhood scale: Scampia and Bijlmer. The two neighbourhoods were founded in the 1960s in response to housing shortages and designed according to the architectural and urban ideology of CIAM. Both were the most problematic suburbs in their respective cities of Naples and Amsterdam. While Bijlmermeer has improved considerably in the last 20 years, Scampia still suffers from a condition of strong social fragility. In both neighbourhoods, architecture has become a symbol and object of stigma and a **social condenser** of socio-economic and skin problems. The research was carried out through literature studies and fieldwork.

Both neighbourhoods were designed to be residential only and many services were not realised. Both were conceived as dependent on the centre, but at the same time they were well connected to their respective centres. The architecture and urban configuration of Bijlmermeer was not appreciated by Dutch citizens, and after a phase of semi-abandonment it became a multi-ethnic ghetto of predominantly Surinamese immigrants. The Vele of Scampia were inhabited unfinished and then occupied and overcrowded following the 1980 earthquake.

Forced cohabitation and isolation led to exclusion from the rest of the urban system and the formation of a ghetto rejected by both the rest of the city and the inhabitants themselves. Strong criminal phenomena, mainly related to drug dealing, took place in these waste areas. Today, both neighbourhoods are going through a process of urban regeneration. Bijlmermeer at a more advanced level, while Scampia is now in the midst of its most important transformation.

People establish links with places either because they inhabit it, or because it becomes a reference and a space for common practices and interests. In Section 7 Scampia and Bijlmer case studies are compared. In their regeneration processes the place communities played a key role. Small circular economy activities do not make a huge difference in terms of urban material balance of a flow analysis MFA, but small collaborative projects, however, can generate non-use values, social cohesion and trigger other incremental processes of urban regeneration, economy and cooperation. A qualitative approach to the study of these cases is preferred to explore the intertwining of wasted architecture with conditions of social marginality, rejection and exclusion.

The hypothesis underlying the research is that wastescape regeneration is possible through circular economy practices. This hypothesis is valid in the case of a wastescape consisting of the waste streams of urban metabolism. In the sense of wastescape in continuity with Appadurai's interpretation of -scape. Waste is a cultural product, of consumer society. In the same way, abandoned places or places marginalised by the city experience exclusion due both to objective disadvantages and to a negative stigma that feeds on itself over time. Overcoming waste is therefore first and foremost a cultural process. Circular economy practices have a value and environmental impact when applied on a large scale to

large production chains. On an urban scale, the city aiming to become circular is going through transitional processes in which the small and medium-sized practices of local communities produce tangible and intangible values with a socio-cultural, but also economic and environmental impact.
In these growing social processes, as in the case of Scampia and Bijlmer, the need for method in the *craft of collaboration* emerges. Thus, Circular Economy and Circular City can develop a new approach to urban life and economy that shape cities and people well-being. Wastescape regeneration can therefore start from the strategic implementation of urban landscape services (Paragraph 3.2.2) and through collaborative practices. Make things together is one of the biggest challenges of circularity. Decision making is not an exact science because multiple criteria and multiple points of view are at stake. *Cooperation is a craft* (Sennett, 2012). Then, decision making processes need support tools to guide stakeholders and actors involved.
Collaborative practices and *choral architecture* are one of the issues of the 17th International Architecture Exhibition - La Biennale di Venezia in 2021.
In the Italian pavilion "Resilient Communities", the curatorial team of Alessandro Melis placed climate change at the centre of the debate. Resilient Communities starts from the idea of a refunding of architecture in response to environmental challenges. The architect's role is central not only to the construction industry economy but for the management of all urban resources, in design oriented co-creation new processes. In reinventing the future, the transformation of architecture and the urban fabric must aim to transform communities into open, virtuous and resilient systems. The ability of communities to respond to climate and social change is essential (Resilient Communities, 2021).
The response to the climate crisis and cultural regression of some places is a challenge for the near future. Cities and their inhabitants must become the protagonists of the urgent regenerative processes at the local scale, starting from waste. New cultural perspectives to overcome the idea of waste require much more awareness, education, action and activism, in in the path of deep ecology.
Close productive circles and open urban communities to inclusion and diversity.

Annexes 2

Table 26. Classification of waste flows according the European Waste Catalogue (2001/118/EC as amended)

01	WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING, AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS
02	**WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING**
03	WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD
04	WASTES FROM THE LEATHER, FUR AND TEXTILE INDUSTRIES
05	WASTES FROM PETROLEUM REFINING, NATURAL GAS PURIFICATION AND PYROLYTIC TREATMENT OF COAL
06	WASTES FROM INORGANIC CHEMICAL PROCESSES
07	WASTES FROM ORGANIC CHEMICAL PROCESSES
08	WASTES FROM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS), ADHESIVES, SEALANTS AND PRINTING INKS
09	WASTES FROM THE PHOTOGRAPHIC INDUSTRY
10	WASTES FROM THERMAL PROCESSES
11	WASTES FROM CHEMICAL SURFACE TREATMENT AND COATING OF METALS AND OTHER MATERIALS; NON-FERROUS HYDRO-METALLURGY
12	WASTES FROM SHAPING AND PHYSICAL AND MECHANICAL SURFACE TREATMENT OF METALS AND PLASTICS
13	OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)
14	WASTE ORGANIC SOLVENTS, REFRIGERANTS AND PROPELLANTS (except 07 and 08)
15	WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED
16	WASTES NOT OTHERWISE SPECIFIED IN THE LIST
17	**CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**
18	WASTES FROM HUMAN OR ANIMAL HEALTH CARE AND/OR RELATED RESEARCH (except kitchen and restaurant wastes not arising from immediate health care)
19	WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTEWATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE
20	**MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS**

Annexes to Section 5: Le Vele di Scampia case study

Visits on site: Notes and photos

N.	Day	Where	Purpose and fieldwork	Places	Result
1st	Feb-20 2020	The Sail A and the public space	Starting day of the demolition of the Sail A. Visit to the demolition site alone. Semi-structured interview to the owner of Bar Metrò (not recorded). Meeting on-site Eugenio F. (photographer curious of visiting the site) and walk around together in the neighbourhood. Participation with him in the evening at concert in the public space of the Sail C, event organised by the Comitato Vele to celebrate the start of demolition.	Bar Metrò, Sail A demolition site, Via Labriola, Via Gobetti, public space between Sail C and D.	A first direct approach to the actual life condition in the area.
2nd	Jun-20 2020	The Sail D	First visit the Sail D with Nancy, a young girl from Secondigliano who contacted after the survey. Seeing the buildings' current condition, talking with some inhabitants, and seeing the informal activities. Visiting the Pinetina Monterosa reclaim made by Needle project.	Sail D: the corridors and public space between Sail C and D. (While we were walking to get into the Sail C, Nancy decided it was better not to enter but back another time with her uncle.)	Visit of the semi-public spaces of the Sail D and the outdoor space, photos, videos. Interview on-site with my guide Nancy, a young girl from Secondigliano. Interview on-site with G Raro.
3rd	Jul-20 2020	The Sail D	Second visit to the Sail D with Salvatore Esposito. Visit squatted private spaces and talk with squatters to understand their conditions and self-organization in the building.	Sail D, the corridors, a terrace, an apartment.	Visit of: a squatted terrace, an occupied apartment, the semi-public space. Interviews with two squatters: M. and P.
4th	Jan-18 2021	Around the neighbourhood	Visit of street art around the neighbourhood with Simone T. and Sofia M. Visit of parks of Scampia, checking the accessibility to the park, passing through different plots of the neighbourhood and visit the Blue Sail.	Corto Maltese Park, Ciro Esposito Park, Piazza Giovanni Paolo II, inside the Sail B	Visits of regenerated sites, green areas places, the boudaries of the lotM and and street art pieces in the neighbourhood.

Data from social networks

Click here to go back to Paragraph 5.3.2

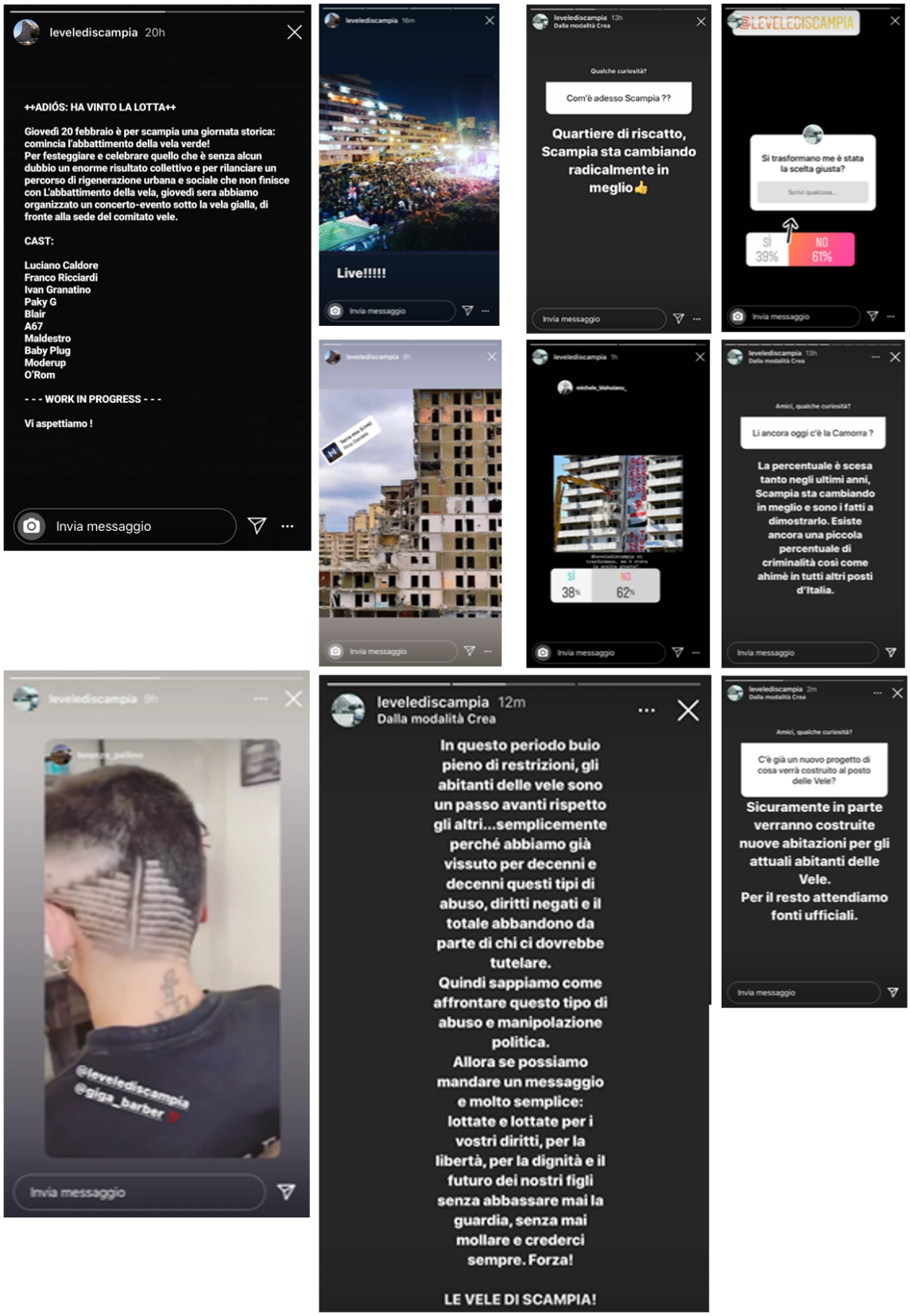


Figure 41. Identity and insights from Vele inhabitants. Screenshot from IG stories of "Le Vele di Scampia" profile

Survey on Scampia

The objective of the questionnaire: This questionnaire aims to collect points of view about Scampia and Le Vele, the point of view of residents, inhabitants of the neighbourhood, inhabitants of the Vele and anyone who knows it or is interested in expressing a personal view. We believe that we need to understand the place starting from the perceptions and existing uses of those who know it from the inside for a genuine regeneration.
(93 responses)

1. Chi sono / **Who I am**

Q1. Anni/ **Years**

Answer Choices	**Responses**	
under 18	2%	2
18-24	12%	11
25-34	43%	39
35-44	20%	18
45-54	15%	14
55-64	3%	3
over 65	3%	3
	A.	**90**
	S.	**3**

Q2. Sesso / **Sex**

maschile	41%	36
femminile	59%	52
altro	0%	0
	A.	**88**
	S.	**5**

Q3. Dove abiti? / **Where do you live?**

Non a Napoli	22%	20
In un quartiere di Napoli lontano da Scampia	18%	16
In un quartiere di Napoli vicino Scampia	18%	16
Nel quartiere di Scampia	35%	31
A Scampia, nelle nuove case popolari	2%	2
A Scampia, nelle Vele	3%	3
	A.	**88**
	S.	**5**

Q4. Dove lavori? / **Where do you work?**

A Scampia	8%	7
In un altro quartiere di Napoli	30%	26
Fuori Napoli	11%	10
Dove capita	22%	20
Non lavoro	28%	25
	A.	**88**
	S.	**5**

Q5. Come vivi? / **How do you live?**

Lavoro regolarmente con contratto	24%	21

Lavoro indipendentemente	28%	25
Lavoro regolarmente in nero	8%	7
Lavoro part-time	3%	3
Non lavoro, mi mantiene la mia famiglia	19%	17
Mi arrangio come posso	10%	9
Ho una pensione	3%	3
Ho il reddito di cittadinanza	2%	2
	A.	**87**
	S.	**6**

Q6. Che lavoro fai? / **What is your job?**

Impiegato in una società	11%	10
Dipendente pubblico	10%	9
Libero professionista	20%	18
Titolare di attività indipendente	3%	3
Imprenditore	1%	1
Artigiano	1%	1
Studente	8%	7
Artista	5%	4
Nessuno	22%	19
Altro (specificare)	18%	16
	A.	**88**
	S.	**5**

Q7. Che lavoro vorresti fare? / **What work would you like to do?**

Impiegato in una società	9%	8
Dipendente pubblico	20%	18
Libero professionista	18%	16
Titolare di attività indipendente	9%	8
Imprenditore	8%	7
Artigiano	6%	5
Artista	16%	14
Altro (specificare)	15%	13
	A.	**89**
	S.	**4**

Q8. Che cosa ti piace fare nel tempo libero? / **What do you like to do in your free time?**

Uscire con gli amici	21.59%	19
Stare con la mia famiglia	30.68%	27
Dedicarmi ai miei hobby	38.64%	34
Altro (specificare)	9.09%	8
	A.	**88**
	S.	**5**

Q9. Potendo scegliere, dove vorresti abitare a Napoli? / **If you could choose, where would you like to live in Naples?**

A Scampia	34%	30
Al centro di Napoli	31%	27
A Posillipo	16%	14
Altro (specificare)	19%	17
	A.	**88**
	S.	**5**

Q10. Che cosa vorresti per la tua casa ideale? / **What would you like to have in your deal home?**

Stanze grandi	7%	6
Balcone	14%	12
Giardino	30%	26
Piscina	3%	3
Molta luce	15%	13
Panorama con mare	27%	24
Altro (specificare)	5%	4
	A.	**88**
	S.	**5**

Q11. Sai cos'è l'economia circolare? / **Do you know what circular economy is?**

No, mai sentito	23%	21
No, ma ne ho sentito parlare	16%	14
Sì, ne so qualcosa	43%	38
Sì, sono bene che cos'è	18%	16
	A.	**89**
	S.	**4**

Che cos'è Scampia per me **/ What Scampia is for me**

Q12. Sei mai stato a Scampia? / **Have you ever been to Scampia?**

Answer Choices	Responses	
Mai	7%	5
Di rado	8%	6
Qualche volta	10%	7
Spesso	31%	23
Vivo a Scampia	45%	33
	A.	**74**
	S.	**19**

Q13. Quanto conosci il quartiere? / **How much do you know the neighbourhood?**

	1		2		3		4		5		Total	W. A.
smiley	7%	5	15%	11	8%	6	20%	15	50%	37	74	3.92
											A.	**74**
											S.	**19**

Q14. Ti piace Scampia? / **Do you like Scampia?**

	1		2		3		4		5		Total	W. A.
heart	9%	7	15%	11	18%	13	15%	11	43%	32	74	3.68
											A.	**74**
											S.	**19**

Q15. Qual è il tuo posto preferito nel quartiere? / **What is your favourite place in the neighbourhood?**

Answered	**69**
Skipped	**24**

Q16. Perché? / **Why?**

A.	**68**
S.	**25**

Q17. Negli ultimi anni, è migliorata la tua opinione del quartiere? / **Over last years, did your opinion of the neighbourhood improved?**

	66.1	100	
(no label)	5	%	71
		A.	**71**
		S.	**22**

Q18. Frequenti spesso Scampia? / **Are you often in Scampia?**

	63.6	100	
(no label)	1	%	68
		A.	**68**
		S.	**25**

Q19. Se sì, in quale momento della giornata? / **If yes, in what part of the day?**

Mattina	31%	19
Pomeriggio	49%	30
Sera	16%	10
Notte	4%	2
	A.	**61**
	S.	**32**

Q20. Perché frequenti Scampia? / **Why do you go to Scampia?**

Ci vivo	40%	27
Ci lavoro	7%	5
Vado a trovare amici o parenti	22%	15
Ci vado per motivi precisi	19%	13
Altro (specificare)	10%	7
	A.	**67**
	S.	**26**

Q21. Qual è la cosa più bella che puoi fare a Scampia? / **What is the best thing you can do in Scampia?**

Answered	**64**
Skipped	**29**

Q22. Quanti dei tuoi amici abitano a Scampia? / **How many of your friends live in Scampia?**

	41.9	100	
(no label)	8	%	68
		A.	**68**
		S.	**25**

Q23. Quanti dei tuoi parenti abitano a Scampia?/ **How many of your relatives?**

	25.8	100	
(no label)	9	%	65
		A.	**65**
		S.	**28**

Q24. Sei parte di un'associazione? / **Are you part of an association?**

Sì, una	17%	12
Sì, più di una	11%	8
No	72%	52
	A.	**72**
	S.	**21**

Q25. Se sì, quale? / **If yes, which one?**

Answered	**32**
Skipped	**61**

Q26. Partecipi a eventi organizzati in gruppi o associazioni a Scampia?/ **Do you take part in events organized in Scampia?**

No, nessuno	36%	25
Sì, uno	10%	7
Sì, alcuni	40%	28
Sì, molti	11%	8
Non mi interessano	3%	2
	A.	**70**
	S.	**23**

Che cosa sono le Vele per me / What the Vele are fo me

Q27. Ti piacciono le Vele? / **Do you like the Vele?**

	1		2		3		4		5		Total	W. A.
star	22.41%	13	12.07%	7	27.59%	16	6.90%	4	31.03%	18	58	3.12
											A.	**58**
											S.	**35**

Q28. Sei affezionato alle Vele? / **Are you fond of the Vele?**

	1		2		3		4		5		Total	W. A.
heart	22.4%	13	6.9%	4	36.21%	21	6.90%	4	27.59%	16	58	3.1
											A.	**58**
											S.	**35**

Q29. Sei contento della demolizione degli edifici? / **Are you happy of the demolition of the buildings?**

(no label)	53.56	100%	58	
		A.	**58**	
		S.	**35**	

Q30. Ti piacciono le nuove case popolari di Via Labriola? / **Do you like the new houses in Via Labriola?**

	1		2		3		4		5		Total	W. A.
thumb	23%	13	9%	5	30%	17	14%	8	23%	13	56	3.05
											A.	**56**
											S.	**37**

Q31. Ti piacciono le nuove case popolari di Via Gobetti? / **Do you like the new houses in Via Gobetti?**

	1		2		3		4		5		Total	W. A.
thumb	23%	13	12%	7	19%	11	26%	15	19%	11	57	3.07
											A.	**57**
											S.	**36**

Q32. Da chi è frequentato lo spazio esterno tra le Vele? / **Who go to the public space between the Vele?**

Bambini	7%	4
Giovani	13%	8
Adulti	3%	2
Anziani	2%	1
Persone di tutte le età	74%	44
	A.	**59**
	S.	**34**

Q33. Quando è bel tempo, in che orari lo spazio esterno tra le Vele è più frequentato? / **When the weather is good, at what times is the outdoor area between most frequented?**

Mattina	27%	15
Pomeriggio	63%	35
Sera	7.3%	4
Notte	1.8%	1
	A.	**55**
	S.	**38**

Q34. Tra le Vele, ci sono i punti di riferimento per trovarsi con amici? / **Between the buildings, are there meeting points?**

	1		2		3		4		5		Total	W. A.
smiley	38.18%	21	23.64%	13	21.82%	12	9.09%	5	7.27%	4	55	2.24
											A.	**55**
											S.	**38**

Q35. Che cosa puoi fare alle Vele? / **What can you do at the Vele?**

Niente, è solo una zona di passaggio	37%	21
Chiacchierare sulle panchine con amici	17.5%	10
Fare sport	7.0%	4

Solo parcheggiare la macchina	1.5%	1
A volte ci sono feste	8.8%	5
Altro (specificare)	28%	16
	A.	**57**
	S.	**36**

Q36. Quali attività di quartiere ci sono vicino alle Vele (mercati, feste, altri eventi collettivi)? / **What neighbourhood activities are there near the Vele (markets, festivals, other collective events)?**

A.	**51**
S.	**42**

Q37. Dove si svolgono? / **Where they are?**

A.	**42**
S.	**51**

Q38. Quanto è frequentata la zone delle Vele? / **How busy is the area?**

	1		2		3		4		5		Total	W. A.
star	12%	6	18%	9	36%	18	24%	12	10%	5	50	3.02
											A.	**50**
											S.	**43**

Q39. Ti piace questo spazio pubblico? / **Do you like this public space?**

	1		2		3		4		5		Total	W. A.
thumb	26%	13	32%	16	24%	12	8%	4	10%	5	50	2.44
											A.	**50**
											S.	**43**

Q40. Sei affezionato a questo posto? / **Are you fond of this place?**

	1		2		3		4		5		Total	W. A.
heart	21.6%	11	13.7%	7	17.65%	9	11.8%	6	35.3%	18	51	3.25
											A.	**51**
											S.	**42**

Q41. Perché? / **Why?**

A.	**43**
S.	**50**

Q42. Hai amici o parenti che abitano alle Vele? / **Have you got friends of relatives living in the Vele?**

(no label)	16.33333333	882	100.00%	54
			A.	**54**
			S.	**39**

Q43. Se sì, vai a trovarli? / **If yes, do you go to visit them?**

(no label)	21.2	100%	47
		A.	**47**
		S.	**46**

Q44. Se lasci la macchina o il motorino in giro alle Vele, temi che venga rubato? / **If you leave your car or motorbike around, do you fear it will be stolen?**

(no label)	32.5	100%	53
		A.	**53**
		S.	**40**

Q45. Passi in mezzo alle Vele per andare da qualche parte a Scampia? / **Do you pass through the area to go somewhere in Scampia?**

(no label)	50.6	100%	54
		A.	**54**
		S.	**39**

Q46. A Scampia lavorano tante associazioni e tanti gruppi di volontari. Hai partecipato a qualche attività vicino alle Vele? / **There are many associations and groups of volunteers working in Scampia. Have you participated in any activities around the Vele?**

Answer Choices	Responses	
Mai	34%	20
Di rado	15%	9
Qualche volta	27%	16
Spesso	17%	10
Sempre	7%	4
	A.	**59**
	S.	**34**

Q47. Se sì a quale attività? Quando? / **If yes, in what and when?**

Answered	**37**
Skipped	**56**

Se conosci le Vele da dentro / If you know the Vele from inside

Q48. Com'è usato il piano interrato delle Vele? / **How is the basement of the Vele used?**

Parcheggio	11%	5
Deposito	16%	7
Discarica	40%	18
Attività per riparare auto e moto	2%	1
Altro (specificare)	31%	14
	A.	**45**
	S.	**48**

Q49. Qual è il posto più brutto dentro i palazzi? / **What is the ugliest place inside the buildings?**

Le scale
Il primo piano della vela rossa
Il piano interrato
Garage
I piani interrati
Garage
Non lo so
Non lo so, non ci abito
I ballatoi
Il piano interrato
Per me Nessuno e tutto bello, sono le persone che hanno reso le vele brutte
il degrado rende brutti i posti
Non so.
Gli androni interni, sembra un carcere.
Seminterrato
Le scale
Piano - 1 e 0
Dove dovrebbero esserci i box auto
Scale e ballatoi
Piano interrato
Non lo so
Corridoi con tutte le abitazioni
Dove ce buoi
O palazzi abandonati
i piani interrati e gli scantinati
nessuno
Tutto , in particolare dove ci sono gli zingari
Scale
L'interrato
Tutto
pianerottoli
I seminterrati
Non so
le scale
Nei ballatoi, non esistono ascensori.....
Potrei scrivere un sacco di cose, una delle tante: le case abbandonate e i piani altissimi
I corridoi

A.	**38**
S.	**55**

Q50. Qual è il posto più bello dentro ai palazzi? / **What is the most beautiful place inside the buildings?**

Le terrazze degli ultimi piani
Il tetto
I terrazzi delle case. In alcuni Si vede un panorama eccezionale
Terrazzo
La vista degli ultimi ballatoi
Case
Il balcone dell ultimo piano
Le terrazze
L'ultimo piano dove si vede tutta scampia
I ballatoi
Non so.
Non ci sono posti più belli, sono le persone a renderlo bello sotto certi aspetti.
Terrazze ultimi piani
Nulla
Nessuno
Le case delle persone di cuore
Terrazze
I ballatoi
Non lo so
Quasi nessuno
In mezzo ai corridoi
l ultimo piano sembra di essere in montagna tra i venti , e riesci a goderti un panorama a 360 gradi.
nessuno
Non c'è
Boh
La terrazza
Alcune persone
attico
nessuno
I terrazzi
Campetto da calcio
Le terrazze

A.	**36**
S.	**57**

Q51. Le persone che abitano nelle Vele sono una comunità? / **Are the people who live in the Sails a community?**

	1		2		3		4		5		Total	W. A.
heart	10%	4	15%	6	37%	15	20%	8	18%	7	40	3.2
											A.	**40**
											S.	**53**

Q52. Quale delle tre Vele è quella messa meglio? / **Which of the Vele is the better conservated?**

La Vela Blu	50%	18
La Vela Gialla	20%	7
La Vela Rossa	30%	11
	A.	**36**
	S.	**57**

Q53. Qual è il problema principale dei palazzi? / **What is the main problem of the buildings?**

Answered	**40**
Skipped	**53**

Q54. La Vela Blu sarà riqualificata. Che cosa ci vorresti trovare? / **The Blue Vela will be redeveloped. What would you like to find there?**

Case belle	11%	5
Un Hotel	0%	0
Uffici pubblici	13%	6
Spazi aperti ai cittadini	38%	18
Spazi per bambini	15%	7
Negozi di grandi marche	2%	1
Negozi piccoli	4%	2
Locali / luoghi per il divertimento	17%	8
	A.	**47**
	S.	**46**

Q55. Sai dove andranno a vivere gli abitanti delle Vele, dopo le demolizioni? / **Do you know where the inhabitants of the Vele will live after the demolition?**

Answered	**41**
Skipped	**52**

Q56. Durante il COVID c'è stata solidarietà tra gli abitanti? / **Was there solidarity among the inhabitants during COVID?**

	74.2	100	
(no label)	6	%	42
		A.	**42**
		S.	**51**

Q57. Che tipo di gente vorresti che frequentasse Scampia? / **What kind of people would you like to see frequenting Scampia?**

Nuovi residenti	9%	5
Studenti permanenti	38%	20
Lavoratori che la sera vanno via	2%	1
Solo le persone che già ci vivono	23%	12
Turisti di ogni tipo	27%	14
	A.	**52**
	S.	**41**

Q58. Spazio per un commento di qualsiasi tipo:

- Spero di tornare a Scampia tra 10 anni e vedere che il quartiere sia migliorato. Spazi pubblici adatti per essere vissuti dai bambini e dai ragazzi. Una riqualficiazione di Piazza Giovanni II simile a quella di piazza Municipio. Più negozi e sopratutto più cultura
- Scampia è Napoli e questo non va dimenticato. La vela rimanente potrebbe essere trasformata in un museo di tutte le arti, un museo attivo, spazio anche laboratorio, dedicato alle diverse fasce di età bambini, ragazzi, giovani, adulti, anziani. Qualcosa di qualitativamente molto buono. Al suo interno anche le arti audio-video con spazi di formazione professionale x i ragazzi e giovani.
- E' una periferia che non ha mai avuto vere opportunità di riscatto per i suoi abitanti.
- Scampia è uno di quei posti nel mondo dove trovi la spiritualitá vera, la condivisione e negli ultimi anni una grande voglia di riscatto. Scampia andrebbe raccontata dall suo interno e dalle tante persone che stanno lottando per un futuro migliore per loro e per il quartiere
- Degrado
- Personalmente penso che Napoli sia un problema in generale. Io vorrei andare via da questa città ma per comprovati problemi di natura psicologica non riesco. Sta di fatto che a Scampia e Napoli io non vivo bene
- Il laboratorio politico Scampia Felice ha elaborato proposte anche relative al recupero degli spazi lasciati dall'abbattimento delle vele e relativi alla vela celeste. Sono presenti in due manifesti/documenti che potreste procurarvi. Qualcuna mi sembra molto interessante come la creazione dell'Altro mercato, comprensivo anche dell'artigianato, e nella vela celeste oltre agli uffici della città metropolitana, un archivio storico che raccolga libri tesi video ,documenti tesi di laurea materiale artistico e tanto altro che fanno la storia di Scampia. E magari uno studentato sperando che presto vada in funzione l'Università.
- Mi chiamo Nancy Gallifuoco, per me il problema non sono le vele, il vero problema sono quella categoria di persone che rendono il posto incivile, non tutte le persone perché a Scampia sopratutto nelle vele non vivono persone cattive. Per me le vele devono essere assolutamente riqualificate è farò il possibile per non farle abbattere.
- sono contro l'abbattimento e a favore del recupero complessivo delle Vele
- Biosgna imparare a preservare le persone e i territori. Ognuno può fare la sua parte, non necessariamente biosgna viverci per solidarizzare e dare comunità. La cosa più importante di Scampia è il lavoro fatto per ricostruire una coscienza di comunità nelle persone. Quello che possiamo dare noi è sostenere tali processi e mettere a disposizione saperi e competenze.
- Scampia dovrebbe diventare più. Bella
- Scampia adesso continua ad essere ignorato dalle autorita locale, la cosa bella e che sono nate moltissime associazioni che si danno da fare per cambiare il look di Scampia
- Scampia come ogni posto nel mondo ha i suoi pro e i suoi contro se impariamo a guardare le cose positive vedremo tutti il potenziale che c'e
- Scampia è un luogo vivo
- E' piu facile spezzare un atomo che un pregiudizio
- Scampia è stata per anni esposta ad ogni tipo di commento negativo, vi posso assicurare che non è così.
- Io amo Scampia,e una parte di me che porto sempre nel cuore
- Vengono sublimate!
- Vorrei che scampia fosse vissuta dagli studenti, dai turisti, dalle persone che ci vivono, da nuovi residenti, scampia potrebbe essere la citta del futuro, del arte del design, della moda della cultura basterebbe volerlo. Anche se l'abbattimento delle vele non è la soluzione. Serve anche la voglia di diffondere cultura e soprattutto arte perche è il mezzo piu semplice e facile da comprendere da tutti.PErchè pure a scampia amano il bello.

- io spero che dopo la vela verde abbatteranno anche la gialla e la rossa perche io gli abbattimenti del '97 2000 e 2003 non li ho visti ho visto solo l'abbattimento della verde
- questo posto è un manifesto di come la dignità umana venga sistematicamente calpesta , non appena entri.
- Scampia è tutta gente col cuore
- Scampia non è solo e sempre Gomorra. Scampia è di chi la vive ogni giorno, soprattutto onestamente! Scampia è di chi ci crede. Scampia è di chi la ama e non riesce ad andare via, di chi lotta per migliorarla. Non sempre i media e i giornali descrivono la realtà, spesso si riempiono la bocca parlandone.
- Fiera di scampia.
- più attrazioni per i giovani
- Bellissimo questionario molto generico ma facilmente abbordabile.
- SCAMPIA per me e un posto magico, ti insegna tante cose, se sei di SCAMPIA hai una marcia in più.... e te ne rendi conto soltanto quando allarghi i tuoi orizzonti....
- Le vele sono state vittime di abbandono. Scampia sta cambiando, ma questo non fa notizia, è uno dei quartieri di Napoli in fase di grande miglioramento, non lo dico io, lo dicono i fatti!!!!

A.	**32**
S.	**61**

Q59. Con quale probabilità consiglierebbe Scampia a un amico? / **Would you recommend Scampia to a friend?**

Detractors (0-6)		Passive (7-8)		Promoters (9-10)		Net Promoter Score
44%	22	40%	20	16%	8	-28
					A.	**50**
					S.	**43**

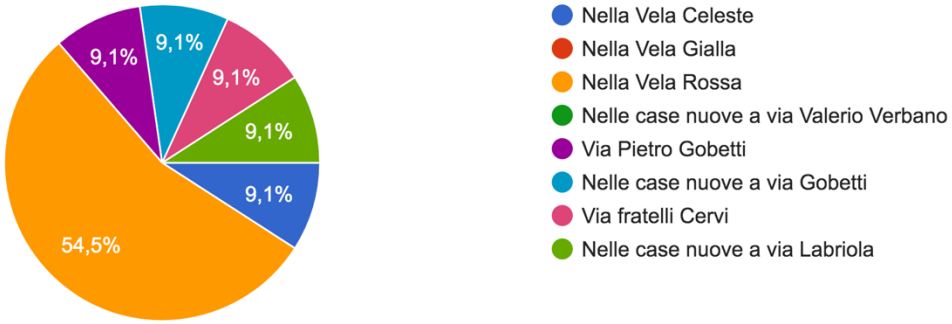
Q60. Ti va di partecipare alla creazione di una cartolina multimediale da Scampia? / **Would you like to make a postcard from Scampia?**

	1		2		3		4		5		Total	W. A.
smiley	4%	1	7%	2	21.5 %	6	21.5 %	6	46%	13	28	4
											A.	**28**
											S.	**65**

2. Survey: Lotto L, M e case nuove a Scampia: questionario sui servizi agli abitanti

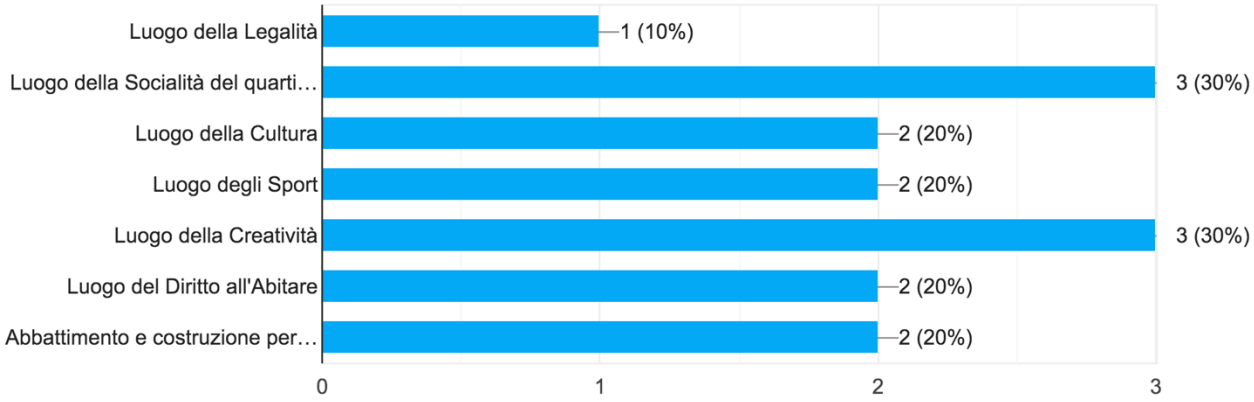
Dove abiti?

11 risposte



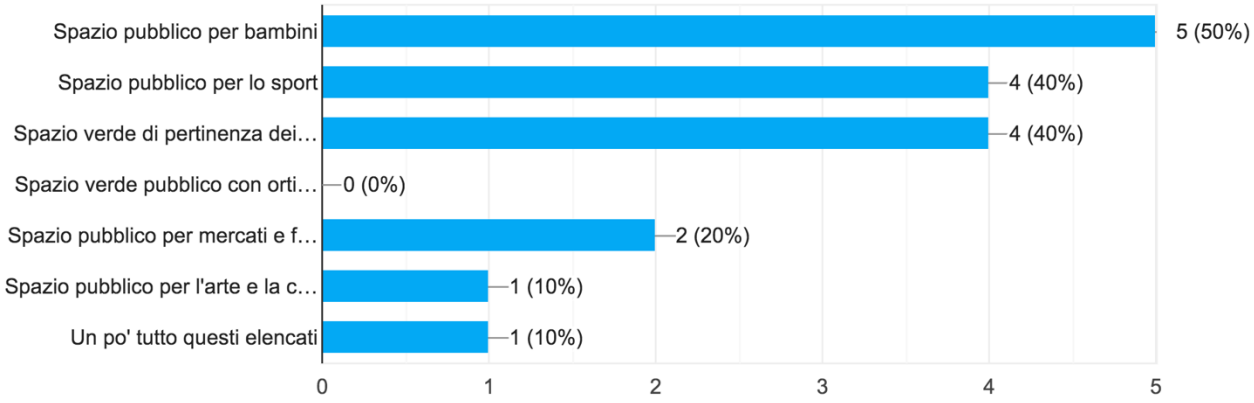
La Vela celeste vorresti che diventasse

10 risposte



Lo spazio esterno del Lotto M vorresti che diventasse

10 risposte



Interviews on the Scampia case study

Click here to get back to Paragraph 5.4.2

1. SUBJECT: Art as a knowledge tool to understand space and architecture	
INTERVIEWEE: Hans Wilschut, photographer and director	
1. Art research	
Your work has an interesting focus on urban transformations, and you have been working in Naples for many years. Your first work in Naples was "Backbone" of 2011. 1.1 Could you tell me something about it?	The televised story of Camorra partly inspires the work Backbone. It reflects on their role in a family-driven society. The connecting bridges of the Vele were something I'd never seen before. When I learned they symbolize the narrow alleys in Quartiere Spagnoli I decided to work based on this feature. From a distance, the bridges look like the spine of a body. Backbone is a metaphoric title, both referring to the story of Camorra as the backbone of society or the bridges as the backbone to the social interaction in the buildings.
After many years you back you have been again in Naples, in Scampia. 1.2 Why did you choose Napoli and Scampia again? Can you tell me something about "La Nave"?	Three years ago, I read about the ideas to demolish the Vele of Scampia. It then felt to me as a turning moment in the history of Napoli. Doing research, I learned that Scampia was represented in media and the film Gomorra mostly by speaking about the bad living conditions, organized crime, drug abuse, and urban decay. I felt the challenge to tell a more human story that would focus more on actual life instead of underlining the cliché's we already know.
1.3 Is there a link between the two works?	In a way, there is. Both works are taking the architecture of the Vele is the leading motive. Both works use a metaphor to reflect on society.
1.4 What do you think art can do to guide and/or influence behaviours and activate virtuous processes?	Art or photography can make issues of society seen and experienced differently. It can address versatile topics and make people think about them. It is the start of new ideas on how to make changes. Photography has the quality to record time as it passes. It can add poetic vision to it and helps to reflect.
2. Impressions and insights of the neighbourhood of Scampia	
2.1 What have been your best moments in Scampia?	Every moment was a unique experience. By getting to know some people living there, I felt a bit part of the environment. By revisiting Scampia, I learned more about social interaction and the way this place 'works'. It is a huge privilege of my work to have this access sometimes.
2.2 What have been the worse moments of your time?	...
3. Impressions and insights of the Sails	
I am interested in the point of view that an artist has on buildings and *life between buildings*. 3.1 What have you noticed there in social activities? 3.2 What features of the Sails inspired your positive and negative impressions?	I have noticed that the social ideals that seem to have defined the structure of the Vele have failed. I have seen how people interact in the grid of the buildings; it truly is another world. People seem to neglect their own living space. There is nothing to generate idealism; any common ground to make something better seems absent. The buildings have become something like tents on a wasteland, where its inhabitants are only interested in their own territorium. **The social structure, however, is unique; people know each other and interact. But in a very primitive way**, there is absolutely no privacy. And each time I visited the Vele, it was shocking to see how little had changed.
4. Buildings in crisis: the behaviours and the architecture	

A building is a place for a community of people. These buildings have been designed as social housing. After the earthquake of 1980, they were occupied and abandoned for decades by public authority. A new process to transform the current scenario is starting by creating a new imagine (demolition of all the Sails but one) and by attracting in Scampia some temporary users with the new University campus. 4.1 What kind of behaviours have you observed? 4.2 Have you observed some organized collective activities in the area of the Sails?	In my film, I have chosen two initiatives that I found very powerful. *L'abero della storie* is one, the project of Davide Cerullo to help children develop senses to their imagination. It is an after school. Not all of it has entered the film, only some images. The other project was Gridas, the social Carnaval in Scampia. This yearly event gives a political driven voice to the inhabitants of Scampia. It is a very powerful event that became an important scene in the film.
4.3 During your work there, have you noticed temporary users around the Sails?	Yes, I have seen some African immigrants occupying some of the houses. They live from the garbage other people throw away. They built shelters in the bushes. It was shocking to see both worlds existing so close together.
4.4 What do you think about the buildings? Do you think adaptive reuses of the Sails would have been possible?	I think it doesn't take a genius to see the Vele have become modern ruins. And people are still living inside. But the buildings are dangerous; the concrete is falling, the bridges are corroded. Water leakage is everywhere. It would take a deep investment to re-use the Vele. The question is if large scale renovation will make a change as the people living inside are not familiar with the responsibility to maintain their own living area. Therefore a social program to make people proud of where they live seems to be a more important take for a significant change of Scampia and the Vele in particular.
4.5 Do you think deleting an image is crucial to start a social regeneration?	In this case, yes. The Vele has become a symbol of failure. It would take much more than a large renovation to change the core of this society. Also, I believe the people deserve a fresh start and a truly nice new neighbourhood. A gesture by the city saying, we take care of you.

2. SUBJECT: The direct experience for the reportage photography "The hell of Scampia"	
INTERVIEWEE: Salvatore Esposito, photojournalist	
1. Personal considerations on Scampia and the Sails	
You are a photographer. How do you work?	I am, first of all, a photojournalist, so I am very attached to reality. I photograph what it is, what's going on, what's happening. Because of my inclination, I'm very attached to the human being, to what happens to man. Let's say my photography is socially committed.
Could you tell me something about your reportage "The hell of Scampia"?	I realized in 2008-2009. I took photos also in 2015, but on the site only in 2008. Then it became a media phenomenon. The Camorra maintained the welfare and the criminal economic engine. Since the State has not intervened, and there was no care or maintenance. There, we have a microworld out of the city's public life. Suppose we do not want to talk about this Neapolitan suburb. For example, French banlieues were created to move people from the French colonies who did not know where to put them. Outside the city centre, and in a condition, in my opinion, disadvantage, because you are far from the most flourishing public life and also from the best services. And then what happened to Scampia. It was built outside the centre of Naples, but keeping this area a little connected. Once the Municipalities made this neighbourhood, there was no public transport. There weren't enough schools, and there wasn't a cinema, a theatre, supermarkets came much later. So, many people, earthquake victims or people with no job, a bunch of disadvantaged people, were put together. In conditions of weakness and without being supported, it is easy that the charm, in Naples as in the banlieues, the youth phenomenon of the gangs turn out to be criminal affairs and micro-economies. In Scampia, this photographic work lasted two and a half years in its first session. When I talked to teenagers at the time, they said, "I have to go to Naples". I said, "Scampia is Naples". At their age, I may have been in Paris. They meant to go to the old town. So, they took the moped and went around their neighbourhood to Secondigliano, Monte Rosa, but in the area. For them, it is their world, a sort of ghetto. I'm not saying that everyone in the suburbs is in a difficult situation. However, it often happens that with a low schooling degree and families with problems, the boys are not accustomed to getting out of the schemes proposed to them. This world arouses in me, as a photojournalist, a curiosity. To investigate, to see beyond the criminal phenomenon, what was happening in these environments in these buildings. In my opinion alone, It was an abomination because if you think -beyond the aesthetic aspect- to put together in a vast palace such a large number of people, with thin dividing walls, that you hear everything... To me, it seemed more like a prison, a balcony where you came out of your cell. Behind the red Sail, the only football pitch had built a camorrist who then shot him. Being together, you don't know where it was supposed to happen. So, beyond the architectural form, and the architect's indulgence, it doesn't work. In all the suburbs, the buildings with big blocks of cement did not work. In Bordeaux, they were dismantled to make two-storey buildings on a human scale with a garden. The rest of Scampia: lot B, lot 33, as they also call it, the horse chatter, are all 12 or 13 storey buildings. I mean, long connections, these avenues, all the same. If the elevator breaks, you have to walk 13 floors. These over-dense neighbourhoods don't work. Having no space, you are led to attack the other. Paradoxically so, where there is a gathering, there is poor livability. You create conflicts between people to earn space, even just for the moped parking. It's math. Beyond the social background, this thing happens—overcrowding without services. Then I asked you for better and worse times there.

	It may seem paradoxical, but even though I've been with drug dealers, traffickers, armed people, but I've only had good times. Despite the hardness of it, I've learned a lot. Having the privilege of observing something so complex from the inside, First of all, it was not easy. I was there for six months without a camera just to get accepted. Besides, I didn't know. Today the phenomenon has also changed. Sometimes I had to run with the guys when the police arrived. I had to live "like them". They made a lot of trouble for me, mistook me for a junkie, wanted to arrest me. A whole series of significant problems, but all in all, I'd do it again a million times over. It gave me a lot, for my way of working as I told you, I feel very close to the human being, and even today with those guys I think. I have a human relationship that I have maintained over time, which means that my work has been appreciated humanely. The guys didn't see me like a jackal reporter leaving after I finished the job. I am still present in their lives, and they in mine. I know a boy managed to get out of that; now, he is writing a book about my time there.
Some of your powerful photos tell up close even moments of mind teens shoot up. Even at first glance, I can understand that they were made deep inside the context.	I have been practically part of their gang, I also experienced this architectural dimension. Moreover, I also heard them about Architecture about how much it affected their lives. The guy I was telling you was writing the book, and he said, "When I get back, this place gets me down". Yes, he connects the Sails to memories, but they have experienced the feeling of being crushed by that place. Someone says, "this place makes me feel bad psychologically, " which confirms that that structure is not habitable. There are also houses with huge terraces, but there was an appropriation. " That house is empty, but I occupy it, I make an entrance for inside" or "I support drugs in that house"... Occupation and total self-management.
When did the boys see your pictures? How did they react?	No surprises. Everything was real, all they already knew.
2. Perspective on the ongoing transformation	
Do you think that the demolition of the Sails is a good choice for the neighbourhood?	The problem is that there it costs more to retrain than to rebuild. The best that must have a symbolic and social purpose can remain standing. You can put offices of the City and Associations that are perhaps of services to the territory. However, he has to change his intended use. Changing the use can transform the symbol of crime into a symbol of legality. Nevertheless, Scampia is too tied to her sails to deprive herself of it. It must remain a bit 'as a warning, a little' to remember what it was but changing the destination. Taking the blue Sail, that's the least ruined. The red is very ruined, the yellow too... It is ok to leave one, in my opinion.
On what could become the Sail that will remain standing: also a residence for artists, a positive symbol for the community, social school, art workshop for the neighbourhood's children. All actions for the area. The Power of the Icon. I wondered if to erase a stigma. Sometimes it is necessary to eliminate the symbol wholly, or if maybe it can change.	Again, what I said at first, it belongs to that territory. It's a warning to keep. For example: in Predappio, there is still the house of Mussolini. It stands because it is historical memory for better or for worse. It could continue to be so, provided that looking at those architectures do not repeat.
The value of the story influences the places. There was Gomorrah who flattened all of Scampia on that idea. On the other hand, can a tale affect a business for the image created from inside?	In my opinion, a story needs always to be told, but in the right way. For example, the film Gomorrah is beautiful. The series emphasizes a series of characters, highlights only Camorra's feuds and a series of behaviours, and even marches too much. Yes, Gomorrah the series is a different story from the book and different from what you did.

3. SUBJECT: Public administration strategy in the RESTART Scampia project	
INTERVIEWEE: Daniela Buonanno, architect, Municipality of Naples	
1. Personal considerations on Scampia and the Sails	
1. Are you directly familiar with the Vele of Scampia? If so, why?	Yes, I know the place since I started working on the RESTART Scampia project.
2. Has the perception of the place changed over the years? If so, how much and how?	Yes, the situation has improved a lot over time. Criminality decreased, and many actions are developing social housing and neighbourhood services.
2. Perspective on the ongoing transformation	
3. There were two lots where the Municipality built the Sails: lot L and lot M. At the end of the 1990s, the first Sails in Lot L were demolished. What do you think of the project to regenerate the already transformed lot?	It was a very long process. In 1994, the Municipality demolished the first Vela and the last one in 2000. Since then, nothing changed this previous February 2020. It seems absurd to think that it was only this year that we could do this (during the pandemic. Those demolitions have allowed the construction of new residences, some of which have only recently been completed and (the residents awaiting assignment) have only recently been relocated. It was also a long time coming. Many documentaries tell of the significant difference in the quality of life in the new residences. These buildings may not have excellent architectural quality but liveable spaces, lifts, and services. Some disabled people have lived in the Vele for decades without an elevator. Here we can always continue to appreciate an urban dimension, of density, with a series of residences on Via Labriola in the area of the new headquarters of the Faculty of Medicine. The Faculty of Medicine has an enormous social and architectural value, being a work by Gregotti. The new residences may not be beautiful or of great architectural significance, but they have massive value for the people who live in them. Vele Committee has prompted this process. All the people who have joined in this struggle for housing, as they call it, call to complete the demolition and construction of new residences because the size (of life) in the Vele is unsustainable. So I think that the regeneration project in Lot L worked because it managed to give new dignity to the Sail's inhabitants moved there. From the urban point of view, this intervention has given back that human dimension that was missing in the modern architecture of the megastructures. In Via Gobetti, new social housing buildings restored the human scale by narrowing the carriageway, creating low buildings with a system of arcades with shops on the ground floor. These elements have created a neighbourhood dimension that was not there before. They are not architecturally extraordinary interventions, we are still talking about public social housing, but they have transformed the way people live in the neighbourhood, bringing people closer together.
4. The demolition process of the Sails started on 20 February 2020. Is there already a plan for the reconstruction of Lot M?	The beginning of the demolition of Sail A was robust, impactful and sustainable due to the demolition technique adopted. Besides not being sustainable, the explosion demolition technique proved ineffective in demolishing the first three Sails in Lot L. The reinforced concrete structures are heavy. The Sails must be acknowledged for their structural quality, as well as their architectural thought. Still, their construction has wholly betrayed the original project by using worse materials and modifying fundamental parts, such as the central walkways. The reconstruction plan exists, of course. This process started from the bottom up with the associations that approached the local

	authority and the Municipality. Together with them, and then together with DiARC (Department of Architecture of the Federico II University of Naples), there was an initial feasibility study involving DiARC, DICEA (Department of Civil, Construction and Environmental Engineering), and DIST (Department of Structures for Engineering and Architecture) of the Federico II University together with the City Council. Moreover, the Comitato Vele shared the feasibility study, which wrote the document with its history, battles, and facts. Participation was meaningful from the start because it produced a form that the Municipality of Naples submitted to the government. That document allowed to finance the project to knock down three of the four sails. During the demolition phase of the others, Vela B (the blue Sail) will be a temporary residence, and then it will become the institutional seat of the Metropolitan City. To preserve a Vela, you have to change its function completely. The inhabitants have said, "never again houses in the Vele". The real problem with the Vele is that they were "social washing machines", and that's why they were not torn down before. In other words, people were leaving because they had council houses, and others were coming in who were in need. Over time many immigrants and Roma arrived, and public authorities left them standing so that everyone could go there and have a roof. It is not something that was decided strategically, but it happened. This condition is unthinkable today, primarily because of the state of total degradation of the buildings. There are no sewage connections, no running water—an impossible situation in a civilised country.
In this regard, why has the Municipality not done any maintenance over the years?	Since the first demolitions, the popular demand has always been to proceed with the demolitions and have new social housing. Most of the work has been done by the Municipality through demolitions. But if a building continues to be occupied, it is impossible to demolish it because it is difficult to relocate families, often many of them. So connections were cut and lift removed to prevent them from being occupied again. Over the last years, a big part of the public work consisted in finding the funds to proceed with the demolitions, with the very long timescales of bureaucracy. When we started talking about it (in 2015) until we carried out the intervention, five years have passed, which is also almost a record in such an operation. This process was very complicated, so we did not have to maintain the Vele, but to prevent them from occupying flats. Then you know what happens. But you avoid acting (with the evictions) not to exacerbate social conflicts. Therefore you loosen the control and the fight against certain phenomena. Some flats were closed by the Municipality, bricking up doors and windows, but in the meantime, squatters arrived, and when we returned to the site, we sometimes found people had knocked down the walls. These occurrences have led to increased waiting lists for assignees, and new houses, new funds, projects and authorisations are needed. To control squatting and avoid overcrowding, the Committee members have been constructive because they know that such a condition would make it impossible to demolish. Their strength and intention have been crucial.
5. Will the families living in the Vele be moved to new buildings constructed on the same plot or elsewhere?	Yes, the new residences will be built in the same plot. In 2020, Vela A was demolished. A Municipal Policy Act provides a temporary

	complex of light, modular, quality housing before the final building construction. According to the new plan for plot M, RESTART Scampia will build temporary housing on the site of the demolished Vela A. However, as far as the master plan is concerned, we prepare an international competition when all the sails are ruined. The competition will not be a competition of ideas but possible feasibility studies for transforming the area, which must undoubtedly include housing. There will be at least 300 new flats to accommodate the inhabitants of the Vele or the neighbourhood. Still, we will make a design that will completely rethink the concept of modernist utopia. We will work on an urban dimension of integrated urban services, collective with equipment, bring services, activities, public spaces. Not park areas, because there is a beautiful park next door (Ciro Esposito Park) that needs to be better connected. In fact, in the feasibility study carried out with the University, there are guidelines for possible actions to reconnect this area of Lot M with the surrounding system, with Piazza Della Socialità, with Piazza Giovanni Paolo II. The international competition is significant because Scampia has now become part of the world, with the negative publicity of Gomorrah. Still, there is a worldwide interest, so we have thought of changing its face by calling in international studies.
- Could the only remaining Vela have a tremendous value for the neighbourhood?	Yes, exactly. Those who still maintain that it is wrong to tear down the building do not understand that eliminating the close link between the Vele, the Camorra, drugs, crime, and the underworld can restore dignity to architecture. Unfortunately, this will not be possible as long as they are in that degradation. Only by managing to change the narrative and placing the Vela in the context of a neighbourhood with a diversified social level, generating mixité, will it be possible to look at the Vela free of negative connotations and appreciate its beauty and architecture value, which it undoubtedly has. The Vele has built an urban landscape, which also recalls Vesuvius. In my opinion (by leaving one of them), we will do the same thing as those against its demolition. Namely to be able to look at it without associating it with negative symbols.
6. What is the vision for transforming the plot area with the Vela Celeste and creating new residences?	In the temporary phase, the blue Sail (Vela Celeste) will be residential. At the end of relocating families, it will be the headquarters of the Metropolitan City, with integrated services for the neighbourhood.
What potential does the area have concerning the city of Naples and North Naples?	The title of the project Restart Scampia as a new centrality of the metropolitan area suggests considering it the new centre and hinge of the metropolitan conurbation. Therefore a centre destined to have enormous potential for the whole area. It is no longer a periphery for a centre but the gateway to a metropolitan system connected with the station and the airport.
8. The University and its offices will attract new flows during daylight hours. What users do you intend to draw to Scampia, and at what times of day would you like to animate the neighbourhood?	The new university building will be a university campus with classrooms and laboratories and a health centre in the area. The original project was only to house the Federico II Faculty of Medicine, but it became the Faculty of Health. The project has become a health centre for the local area, with day hospitals and consulting rooms managed by the ASL (local health authority) and the Federico II University Hospital. It will be a place that is always open, as it will be a reference point for various health services. There will also be part of the Faculty of Food Science headquarters. There will be places to do food counselling activities. So not just a university but very much linked to the territory. Already the University is producing many new

	catering activities and services for students. Students will inhabit many spaces in the neighbourhood. This project results from a variant, and now we are at the end. The tender for the furniture begun, and the University will soon launch the tender for the medical equipment. It is not a short bureaucratic process because the Region puts up the funds and transfers them to the Municipality, the implementing party and the beneficiary. However, if the Region cannot provide continuous liquidity or delays, the work is blocked to pay the companies. The machine of financing and interventions has lengthened the time.
3. Vision for the future	
9. What new functions will host the Vela Celeste besides the offices of the Metropolitan City?	Several functions will be in the same multifunctional logic as the rest of the neighbourhood. The neighbourhood will no longer be a "dormitory district", but like the historical centre where everything is from the supermarket to the pharmacy to the various services, which Scampia does not have.
10. How could a Circular Economy model be made operational in Scampia? Who could be involved, and for which actions?	In addition to the specific issues and identifying specific local actors, I can make a general reflection on circular economy issues about urban regeneration. One question: What can save all our interventions (the public interventions of the Municipality) that require so much time, money, bureaucracy, effort? Administrations eventually manage to do things, but it is often delivered, not used, defaced, or abandoned. Think about individual interventions in public spaces and common areas. Sometimes municipalities struggle to carry out maintenance work that is then vandalised by citizens, perhaps because they do not accept it. In my opinion, an essential aspect of the circular economy must be this: every type of intervention must succeed not only in responding to the needs of the area. Citizens should be aware of taking care of it and ensuring that people cooperate and do not vandalise public works. From the bench to the grand staircase, every project must include forms of collective management. Imagining different forms of use of space, of shared management of space, is necessary to ensure that the area will continue to be used by the Municipality over time. Everybody can do a part in public care. If we always expect things to come from the government, the Region or the Municipality and point the finger at everything that does not come, without us doing anything, in the end, we do not build a network that safeguards public property from despoilers. Protecting the city is the common good. For me, a circular economy model in Scampia, as elsewhere, is this: how to ensure the durability of something born with incredible effort. Nothing is worse than seeing something taken with effort, ruin and decay. It is not just about design, but about managing who and how they use something made. Just as the earth is an asset to be constantly cared for, we must watch all everyday purchases. When someone takes care of it, space will necessarily remove it from other forms of illicit management. It will be illuminated, experienced, crossed. In this way, evil will not happen in that place. There are regulations to this effect in Naples, such as 'Adotta una strada'. A private person can take care of a piece of the street by cleaning it, planting trees or plants, making street furniture, and more. Many shopkeepers have adopted it to improve the environment and promote their business. Each trader can carry out each action following approval by the Municipality, and thus a piece

of public space is donated to the city by traders who have tax relief. This kind of actions generates a buoyant circular economy, where everyone wins. This system has triggered imitation between commercial activities that regenerate the urban areas, always under public surveillance by taking care of public space. It is also a way of overcoming a huge problem: the public purse is empty. To do things alone is impossible. The social network is vital. Social responsiveness (the social fabric) is decisive in realising projects. In Naples, citizens quickly rise when the Municipality tries to do something, even if it is good.

4. SUBJECT: The technical aspect of the Vela A demolition **INTERVIEWEE: Ing. Nicola Salzano de Luna - Servizi Integrati Srl** **(Vela A, C, D demolition company http://servizintegratisrl.it/)**	
1. The demolition work and CDW management	
1. The demolition process of the Sails started on 20 February 2020. How was the demolition project structured?	The Vela "A" project was developed by initially removing the materials left on site by the former tenants, i.e. bulky waste such as furniture, furnishings and fittings of all kinds. Also, the company collected and disposed of urban solid waste since the flats themselves had often been inhabited illegally, and indeed, people left all types of residues there. Therefore, the various housing units were first emptied of these materials, sorted by CER code. Then, using the Strip-out, bituminous components, wood, plastic, glass, were removed by EWC category. Finally, following a suitable reclamation plan, duly approved by the ASL, all the components containing asbestos were removed by a specialised company. The same company took care of the disposal.
2. What is the static condition of the Morandi structures built for the Sails?	The reinforced concrete structures designed by Morandi were in perfect static condition. Only the metal walkways and ladders had already been replaced, and the existing ones no longer offered any guarantees from a static point of view.
3. The demolition started on 20 February showed a building where the demolition company had already removed the components (fixtures, fixed furniture etc.). Have they been sent for reuse, recycling or disposal? To which sites, facilities?	The materials removed, such as iron, plastic and wooden fixtures, were entrusted to ASIA for disposal.
4. Were hazardous materials present? If yes, which ones? In which parts of the building and in what quantities?	Panels containing asbestos were present in the parapets of the stairs leading from the gangway to the various units. Asbestos panels were in the parapets of kitchen terraces and the covering of the cavities at the building unit entrance.
5. What techniques did you have to use to demolish a reinforced concrete building according to current regulations?	The standard does not indicate how demolition must be carried out. It is the choice of the designer in charge.
6. What demolition waste did the demolition of Vela A produce?	During demolition, the structures were deferred. Today, only materials will have to be crushed to be recovered as aggregates.
7. In what quantity?	About 15,000 tonnes.
8. Where will the material be disposed of?	The material will be crushed on-site with an authorised mobile plant and recovered as inert in the Vela "A" area.
9. People can currently see large piles of debris on the tower site. Can this CDW and excavated earth and rock be reused in situ, or is it material awaiting disposal?	All materials currently present will be recovered.
2. Circular Economy for the construction sector	
10. Selective demolition is a crucial step in waste separation and recovery processes to make the circular economy. How can it be encouraged in Italy or Campania?	Selective demolition can be encouraged by sensitising operators, particularly planners, who must "oblige" companies to carry out selective demolition through specific articles to be included in the tender specifications and deliver the various materials to sites where they can be reused and recovered.
11. Which steps in the demolition process can foster the circular economy in Italy or Campania?	A circular economy process for CDW would need a system of incentives and "qualification" of the operators, becoming "pluses" for the awarding procedures.

5. SUBJECT: The struggle in the right to housing and the people organizazion in the Vele

INTERVIEWEE:
Omero Benfenati, representative of Comitato Vele, inhabitant of the Vele

1. Personal considerations on Scampia and the Sails

2. Perspective on the ongoing transformation

6. SUBJECT: Personal point of view on the life and needs of the neighbourhood
INTERVIEWEE: Davide Cerullo, poet and educator, and inhabitant of Scampia
1. Personal considerations on Scampia and the Sails
2. Perspective on the ongoing transformation

7. SUBJECT: Personal experience in social volunteering in Scampia

INTERVIEWEE: Chiara Ceccarelli, educator and psychologist.
(COMPARE Association - Centro Territoriale Mammutt)

A. Personal experience In Scampia

1. Do you know Scampia directly? If so, why?	Yes, I have been going to Scampia for 25 years and have worked in various social voluntary contexts.
2. What is your relationship with the neighbourhood? Why do you know it?	When I was a child, I used to go through the neighbourhood to visit my cousins, and I remember my father telling me that it was complicated and very poor. However, my cousins lived in a lovely park, so I did not directly perceive what my father was telling me. Then I started voluntary social work.
3. How did your voluntary social work in Scampia start?	In 1996 Giovanni Zoppoli took me to a Roma camp because, in Scampia, there was the most extensive presence of Roma in the city, mostly in unauthorised camps. Between Scampia and Secondigliano, there is also an authorised camp. It was the first time I entered a Roma camp, and I also entered this neighbourhood, which until then was unknown.
4. What was the neighbourhood like in the mid-1990s?	It was very different: There was a very long subway, and the Roma camp in Via Zuccarini, under the Scampia underground station, where there is now the entrance to the *median axis* (highway, ANAS 543 Asse Mediano, ex SS 162 NC Asse Mediano. Ed.) and the bus station. The configuration of the city was very different. There were several other camps in the roundabout under the metro bridge, and then there was a camp (which is still there). The camp behind the Pink School, the 10th circle, was a vast unauthorised camp there, which is like 3 or 4 fields. Among the families, there is a substantial distinction due to migration or religious affiliation. It looks like one camp from the outside, but there are very big differences in the different shack assemblages inside.
5. What has been your experience in Scampia?	We started attending this camp because of our passion for working with children. Gradually we started to build an informal group, "COMPARE - Committee for the Allocation and Implementation of Non-Ghetto Housing Solutions for Roma". In the city, we tried to spread our experience and bring people together on the issue. Also, through contacts at the Faculty of Anthropology, with Giovanni La Guardia, a group of university students from different faculties was created. We were all about 23 years old. It was an adventure both in the field and outside the field. Through the sharing of experiences with the children, the field drew a little from active pedagogy. Some of us came from the 73rd circle of Bagnoli, understanding school as a place of creative expression of the individual. Some lived the school in a more restrictive way. These two approaches merged, and many experiences were born. We acted in the Roma camp, outside it and on a political level. As a first action, we built a playhouse in the camp and the neighbourhood inhabitants because there was a need for a space to gather and do things together in the camp. However, we also needed to get outside. So we also held workshops in other places: in the Capodimonte forest, near the seaside or wherever possible. We also networked with other similar groups in the emerging city: The Diego Armando Maradona (DAM) in Montesanto had recently been occupied and had a significant political, social and educational dimension. The association Lo cunto de li cunti was another reference point. So we had built a shack as a reference. We took the children around the city and then acted on a political level. Our work, around 2000, concerned the Roma. We had not yet entered the social fabric of the neighbourhood. In 1999, a big fire was set in the Via Zuccarini camp because some drunken Roma had run over young girls related to people in the Camorra. So they went there with Molotov cocktails and set fire to the camp where, in addition to the games hut and our friend Gaetano's bar hut, we had built a clinic hut with the Kosovars together with Sergio Loi, entirely under the law, where a doctor came twice a week. In this bleak landscape, the municipality wanted to move the Roma to open the median axis. However, it was severely planned because they realised that the planned route was interrupted by a building. Then they demolished the building,

and for a while, there was this scene from the movies of the road ending in front of a building, which was probably illegal.
At that time, there was a revolt in the neighbourhood because people wanted to kick out the Roma.
In Via Zuccarini, we spent the night in the car outside the camp to avoid attacks from other Neapolitans. Civil society started coming to the camp. It was an opportunity to make the city aware of the Roma issue. At that time, the municipality accelerated the construction of two camps behind the Secondigliano prison, with about 92 housing units in containers.
It was inconceivable that billions of lire should be invested in constructing another segregation camp and not in the building of social housing. The policy of mega-camps had already been banned in Europe. We fought against this new segregation, but with little result. We participated in this tragic move in which people left their homes and behind the bulldozers who then demolished the house.
In the containers behind the Secondigliano prison, the Roma had water and electricity, but the place was hazardous and isolated. The new Roma camp created further marginalisation. Many associations started to take the children to school, but we never got involved in this third sector mechanism because it went against our ideas. **We did not want to create welfarism and dependence but independence and autonomy for each individual.**
With a family of Kosovars with whom we had a strong bond, we decided to open a gipsy restaurant. It is a very similar story to that of "Chi rom e chi no" with Chikù. The process of opening up to the outside world and the integration of this Kosovar family created much annoyance with another Roma family, that had connections to the Camorra. So the Roma Camorrists began to threaten them. This fact was another negative result of the mega-camp.
In the camp in Via Zuccarini, the different Roma families were separated, limiting the conflict between them. Instead, in the new situation in which they were all placed, the level of conflict skyrocketed because those who were towards legality or illegality could not get along.
So on 6th May 2000, the attack happened just after I left, around 10.30 in the evening, because they always avoided problems by putting the Italians in the middle. On St George's Day, there was a big party that is important to them.
Then the Roma connected with the Camorra shot at this Muslim Kosovar family who were beginning paths of emancipation. They were forced to leave the camp.

6. Why did you talk about political volunteering?

Public policies for the Roma were inadequate.
Both for knowledge of the Roma community and for schooling processes.
Some schooling processes were developed in the 10th teaching circle, the Pink School. Since the school faced the camp, experiences of contamination and inclusion of children in the school were developed.
In the camp, we did voluntary political work because we wanted to give back the dignity of citizens to people who had been in Naples for twenty years, even as war refugees.
The reasons for nomadism are different, and Roma often moves to escape from social conflicts. The camp is conceived as a place of segregation and invisibility of people. The school itself created marginalisation, for example, by having children shower at school and coming in later. Instead of putting showers in the camp, they exacerbated the differences.

7. Have you succeeded in creating integration between the ghetto of Roma children and the Neapolitan children of Scampia?

Unfortunately, not so much. At the time, our work was focused on Roma, so there was little interaction with Neapolitan children except on a few occasions, such as the GRIDAS carnival.
The first carnival we participated in with GRIDAS was in 2000. Felice Pignataro was still alive. We made a float with all the children dressed as flowers and butterflies and carrying a sign "per noi solo campi di fiori" (for us, only camps/fields of flowers). We also started to create links with the Neapolitans.

8. How did you get in touch with the Neapolitan society of Scampia?

When we met Gaetano Vivavio from Piscinola (neighbourhood next to Scampia Ed.), he was a significant figure in the neighbourhood. He had just come out of prison and had problems with drug addiction, but he wanted to get out. He opened a shack bar in the Roma camp, and there began to turn an economy, which was illegal in an illegal Roma camp, but that was his salvation because he began to earn money by selling drinks to the Roma and not drugs.

	He wrote a book “Non mi avrete mai” (You will never have me) and is the director of “I figli del Bronx” (The Bronx Children). Meeting Gaetano was vital because we did not live in Scampia, so we could not really understand what it meant to live in a degraded and marginalised neighbourhood. Meeting him was fundamental because he let us into the lives of the proletarians, and we began to give him a glimpse of the city. We were joined by the group from the cultural circle in Via Calvieri, a group of young people, Mr Glum, who organised the Sguardo di Ulisse concerts, and they were very clever. They brought Kusturica, and we took the Roma to dance. It was funny!
9. What was the scenery like in the neighbourhood in the 1990s?	Drug use at the time was appalling. Drug addicts were everywhere. **In the pre-Gomorrah years of 1997-2000, you walked in these moors, in these vast roads built in the open countryside, among the agricultural fields. There are pictures of shepherds with sheep, but at the same time, there was a massive amount of junkies. You could see people with syringes in their necks or on their penises, even in the middle of the road, as if it was normal.** Then you ask, "why do kids beat up junkies?". These kids were visually abused. As children they saw real dead people walking in the street. Rosario Esposito La Rossa tells these stories in "Beyond the Snow". In those years, Piazza Giovanni Paolo II (where Mammut is now located) was closed in between sheets of metal because there was an unfinished building site, and it was full of junkies. In those years, we mainly went to the Roma camp. Then we started taking Roma children to GRIDAS.
10. At the end of the 1990s, the municipality pulled down the first Vele. Do you remember anything?	I did not experience the first demolition of the Vele directly because we did not associate so much with Neapolitans. The first Neapolitan we started to meet there was Gaetano Vivaio, who lived in Piscinola, and we started to do something in his neighbourhood with the children.
11. Were the public spaces in the neighbourhood dangerous at the time?	All the subways were inaccessible places. The Villa Comunale has about ten entrances, and at the time, it was hazardous, and no one went there because there were only muggings. A thief would enter from one side and leave from the other. It also comes from illogic urban planning. I think it's the only park in the world that's made like a volcano crater shape, that is, it had little hills on the edges, and you can't see what is going on inside from the outside. The area is not controlled. Now it is an oasis. A child also died in the Villa's pond. Claudia Brignone's documentary 'La Villa Comunale' tells the story of it. Compared to then, Scampia is now an idyllic neighbourhood.
12. In the Red Sail today, there are some Roma families. Do you know how they can live there?	You just pay, you pay the Camorra, and they give you a house in the Vele. Those who have managed to get into the Vele are structured families. I know some of them. They used to come to Mammut. All the new occupants have to pay. Maybe to the Camorra. I don't know who it is, but the occupants certainly pay to whoever is in charge. Even a Neapolitan who wants to go to the Vele has to pay something, maybe 1,000 or 2,000 Euro. The Comitato Vele charges photographers and those who want to tour the Vele. I find it inconceivable that photographers should want to go on tour and that the Comitato Vele should charge for it. Imagine if those who control the area do not charge for that. It is expected that it depends on the situation, but a contribution is made. I do not think there is a real organisation, but **there are different forms of organisation**. You always have to ask someone for authorisation.
13. What is the condition today in the Vele concerning drug dealing?	The trade never went away completely. Maybe it has moved more to one Vela than another. In any case, nothing is done there so freely. But kids who deal can't always be misjudged. **The line between legality and illegality is blurred in fragile places. Reality is complex. There is no black and white. It is necessary to exit the dimension of judgement. We need to understand how offenders got there, what opportunities they had in life.**

Our work at Mammut has always been to create different imagery for young people. However, sometimes we have avoided denouncing young people who were doing something *wrong* because we knew what condition they came from. **It was the same with the Roma: Working against social injustice. Both the Roma and the many inhabitants of Scampia are people who have suffered solid social injustices and an intense state of marginalisation.**

B. The Mammutt Territorial Centre

Due to lack of time in the interview, the experience of Mammut has been retrieved from the web site.

The Mammut Research Centre was born in Naples in 2007 from the experience of the Territorial Centre in Scampia and the COMPARE social promotion association. It is based in Piazza Giovanni Paolo II, in Scampia, under the columns of a large and strange six-column portico called Mammut by the neighbourhood inhabitants because of the profile of its shapes.

In recent years, Il Mammut has developed articulated and complex action research, giving rise to publications and territorial organisations also in other regions of Italy. Mammut's research interweaves pedagogy, urban planning, theatre and figurative arts to experiment with forms of social and conviviality that are valid in our time.

In recent years, we have created a media library, active school workshops with children and their classes, an Italian language school for migrants, a cycle workshop, a guidance centre, a homoeopathic medicine clinic and educational support for adolescents.

The experimentation on didactics, care relationships and urban participation involved more than 10,000 Italian, migrant and Roma children, young people and adults and contributed to the recovery actions for 50 public spaces in the different contexts visited. They managed to collect a lot of "evidence" on the possibility of recovering public spaces through active and participatory pedagogy practices. A square is as extensive and desolate as a desert was filled with children, meetings and study days.

The Mammut is a place where the city gathers and a centre for experimentation and pedagogical research. A research that we have tried to describe in the book "Come partorire un Mammut – senza rimanere schiacciati sotto" (published by Marotta & Cafiero in 2011). We are referring to the birth and consolidation of a "community" with national borders through which we can "do school" with children, young people, Italian, foreign and Roma adults.

We have received many awards for our methodological research, including the commendation of the President of the Republic in 2011, being selected as an international 'good practice' by the National Anti-Discrimination Office - UNAR of the Presidency of the Council of Ministers in 2012 and in international research projects such as "EU-Inclusive", Fondazione Casa della Carità di Milano and Soros Foundation. In May 2013, Centro Mammut received a special mention in the "Giuseppe Dossetti" Peace Prize.

The methodological baggage assembled so far can be consulted in specialised magazines (such as the magazine Gli Asini, the MCE - Movimento di Cooperazione Educativa notebook, or the Montessori notebooks).

C. The ongoing transformation

14. Did you take part in meetings with the Vele Committee on the issue over time?

As long as Vittorio Passeggio was leading the committee, we talked a lot. However, we never participated too much in this. We always supported Vittorio. However, we participated in the Scampia Felix network, created by Father Pizzuti's political laboratory, a network that produced a political document. The Vele issue was not a direct problem for us.

Over time, after Vittorio Passeggio, Omero and Lorenzo began to manage the Committee. The Cantiere 167 was occupied by a group that came from Insurgencia.

When Vittorio organised the bus to go to Rome to demonstrate, we went to support the demands. Vittorio was much more open. The Comitato Vele post-Vittorio has become more closed.

The decision-making process on the Vele is currently held by the municipality together with the Vele Committee. It does not directly involve us or other associations or subjects in the neighbourhood.

8. SUBJECT: Personal experience living and working in the neighbourhood

INTERVIEWEE: Simone *Samurai* Torrone, street artist, an inhabitant of Scampia

A. Personal considerations on Scampia and the Sails

1. Do you know the Vele of Scampia directly? If so, why?	Scampia is the neighbourhood where I live. The Vele are where I have painted a lot of graffiti over the years, so I have experienced it firsthand.
2. Has your perception of the place changed over the years? If so, how much?	Today Scampia has changed physically, architecturally, maybe with the new buildings, the demolition of one of the Vele, the new subway with the graffiti of Jorit outside. However, there is that abandonment of institutions that's always been there. Maybe now less than before, but there is always this lack, you feel. There is a **lack of services and a lack of presence of the State**. We live in a kind of anarchy here, in the absence of the State, from my point of view.
3. For you, which place in Scampia has a symbolic value and why?	For me, the **Mammut is the symbol of redemption and evolution in the neighbourhood**, of a social and cultural revolution. The Mammut creates cultural connections with other neighbourhoods and cities, even with other countries, for the neighbourhood's kids. Mammut organizes trips to workshops, laboratories, everything. It does an essential job on the territory of Scampia, and despite this, the institutions do not give him the proper importance that it deserves.
4. In the neighbourhood, whom do you remind when you have a problem?	Mammut is a landmark of mine.
5. Where do you go to meet your friends?	Still, the **Mammut is one of our favourite places**. However, in this closed period, because of the covid emergency, with my friends, we often meet at Corto Maltese Park, which is also the location where we organized The Message Jam, a graffiti event in 2018 and 2019.
6. Do you attend any association? Since when?	I started attending Mammut on July 19, 2016. It was the day of Scampia Summer Jam vol.2. Before that, I did not know about hip-hop culture, graffiti, breakdance, except for commonplaces. I went to this event held in the square (Piazza Giovanni Paolo II), and there I discovered a new world. I still remember those images, those smiles, people making breakdance battles. But they were no angry; there was a mutual love. The breakers would look at each other with looks of hatred, like "I'm going to kill you", and then they would hug each other. That stuck with me.
7. When did you start making street art?	Initially, I went to Mammut with the Music Production Workshops. I was doing beak dancing at first. Then I started going graffiti with attracted me—the first solo and then with other older boys. Then I brought other kids from Mammutt to paint with me, which was massive. I have been doing graffiti since 2017. I did much graffiti in Scampia, most of it in the Vele. The day the Vele will no longer be there, I think a good 70% of my graffiti will no longer exist. The SAMURAI sign is mine (on the Vela B). Then in 2019 1UP crew came, stayed a month and a half in Naples. Moreover, although they took half of the Vela to do their graffiti, they had the foresight and respect not to *cross*; that is what they say in the jargon, not to cover my graffiti that was already there. That's a nice thing, a form of respect. And then my work is next to some 1UP's, who is one of the greatest graffiti crew in Europe, if not the world. it is great!
8. Scampia seems to be the greenest neighbourhood in Naples, but some have been inaccessible or dangerous, others quieter. Which ones do you like best, which do you frequent most?	There are two parks: the **Corto Maltese Park**, run independently by the Pollici Verdi association, which is a beautiful park that reminds me of Lugano, Switzerland. It is a quiet area. And the Ciro Esposito Park, which used to be the **Villa Comunale** of Scampia, is not very accessible. The villa is beautiful and well maintained, despite the lack of funds. Out of 12 entrances to the park, only one is open, and not even regularly. Sometimes the park is closed for strange reasons.

	This makes the Villa inaccessible to many people because to get in; you have to make a big round trip each time to find an entrance open. The municipality manages the Villa, and there are municipal employees and gardeners.
8.1 They told me that the Villa was closed. It was unsafe because many people were being mugged. After all, muggers could quickly get in one way and out the other. So the Villa was closed for security reasons.	Yes, it is probable. However, if you want to mug people, you can do it outside the Villa Comunale too.
9. In general, what services are missing in Scampia today? Many have improved over time, the new metro, the new university, some food shops. Many have been added, but today which ones are missing that you would like to have?	To refer to a place, for example, I'd like something in Piazza Giovanni Paolo II, which has unofficially been renamed **Piazza Ciro Esposito,** is like an **empty car park** if there were benches, trees, fountains, a chalet, to make aggregation in that square. And services may have increased over the years, but Scampia is **still a dormitory neighbourhood**. Not a single bus passes through here at night. The metro closes at 10 pm.
10. Where can you spend some leisure or relaxation time in the neighbourhood?	Mainly in the Mammut, Corto Maltese Park, and the Villa Comune, where I go to study or run.
B. Perspective on the Vele demolition	
11. What do you think and what do people you know think of the transformation of the Vele (I mean the divergent opinions between demolitions and renovations)?	Many people see it as a rebirth when in fact, i**n my opinion, it almost seems to want to erase the history of Scampia**. Because in the end, Scampia is a place where people don't have much faith in the State. But suppose you, the State, come to Scampia and take a shitty place like the Vele, with its degradation, syringes, flooded garages, mould everywhere, abandonment, people staying there illegally. In that case, you take it and redevelop it, making it into a liveable place, with shops, libraries, meeting places. There, as a State, you have won! Instead, in order not to make all this effort and to solve "everything immediately", they opt for demolition, which in my opinion is an abominable thing. So you erase history. Even an architect who compared the Colosseum to the Vele (Aldo Di Chio of Vulcanica, Ed.) said that terrible things were done there in history, but it wasn't torn down. But worthwhile things are worthwhile if they become a source of wealth for the city.
C. A vision for the future of the Vela and the Lot M	
12. The Vela celeste will be renovated. The municipality plans first temporary housing and then to turn it into offices for the Metropolitan City. How would you imagine it in the future?	I imagine it as **a revolutionary place—a place where all kinds of activities are carried out**, which hosts associations with libraries. I imagine a place where you can do many activities within the space, with green areas, gardens, even on the terraces. Perhaps a part for going out, with discotheques, and another quieter part where you can bring your children, where you can do after-school activities: a multifunctional public centre open to the neighbourhood.
13. What about the public space between the Vele?	Many things could be done, like a **well-kept garden** like the Corto Maltese Park. It does not take much to redevelop an area. It could be an educational garden for school children—places where you can study, like university campuses.
14. Simone, but you once told me something: The Municipality puts benches in the Villa and then someone broke them even if they are made of solid concrete. maybe using pneumatic hammers!	I'll give you the example of the Green Thumbs association. They took over a park that was falling. It was a den of junkies, of people who were messing around. They took it, redeveloped it, and the people in the neighbourhood felt part of that change. If someone in the neighbourhood sees a person dirtying or doing damage, they pick him

So what could be a way to do something in a public space that is not destroyed the next day?	up because he is damaging the community. It's a park in the middle of 12-storey buildings, lots of families, it's a world unto itself. The same thing applies to the Vele. **If the people in the Vele felt that outside their door is their home too**, they wouldn't destroy the benches. They would be careful. When things are broken, there is a widespread consensus that they can be broken.
14. As a young, do you see your future in your neighbourhood?	In the immediate future, no. In the distant future, it may be. At the moment, Scampia does not offer opportunities. One thing that could be done is a tour of Scampia, which has already been done several times with various organisations. This is the most innovative thing that could be done in Scampia (work-wise), but there is not that much potential at the moment. If the neighbourhood were to be developed by institutions, associations and private individuals, perhaps more restaurants would be created and not just the Chikù. The Chikù survives thanks to groups of scouts, of young people who come from outside.
15. Why do you say this? There are no restaurants and pizzerias in Scampia?	There are pizzerias but not the one where I would go out in the evening with my girlfriend. They are small family-run pizzerias, which work more as takeaways and maybe have a small table outside with plastic chairs.
16. I know you are familiar with the idea of the circular economy, which creates new goods and jobs by recovering waste. Do you think it would be possible in Scampia to activate processes to implement circular economy projects?	In my opinion, yes. A good example is given by the Green Thumbs, who manage to recover waste from any difficulty and do something with it. For example, the trees in Corto Maltese Park fell down and instead of throwing them away. They used those to make street furniture and sculptures for the Park.

9. FOCUS ON: Personal experience in living and working in the neighbourhood

INTERVIEWEE: Gianluca Raro, artist muralist and street-artist

A. Personal considerations on Scampia and the Sails

1. Are you directly familiar with the Vele of Scampia? If so, why?	I am from Melito, which is the outskirts of Scampia. For young people, there are more attractions in Scampia than in Melito. Yes, I've known it for years since I was a pre-teen. My uncle and cousin live there. They live in the cherry tree park. They said to go out, and you had to be careful to have the right friends, so you did not make a mistake. I have a distant memory of the primary school fire in the Roma camp. (This event is reported in the interview n. 8 to Chiara Ceccarelli Ed.) I started attending Mammut before they had the headquarters at the Colonnade in Piazza Giovanni Paolo II. Before, they were based at the Lanificio. In the beginning, they were organised at the GRIDAS. I used to go to school in Secondigliano, and I used to see Felice Pignataro (called crazy or drunk, painting in the street.
2. Has your perception of the place changed over the years? If so, how much and how?	Yes. I tie up with associations to paint by going around the neighbourhood with them. In one lot where I drew first, it was a drug-dealing site and then not anymore. And vice versa in other places. **The neighbourhood has changed for two reasons:** **1. Associations enormous work** is as if it had slowed down in the last three years. E.g. The Hurtado Centre was a Church in the Lot P that was more active with the boy scouts. The Mammut did many actions. They cooked outside. They made concerts there, and Scampia summer jam. There was more liveliness until three years ago, maybe even more money. However, those who slowed down gave way to "Chi Rom e chi no" opened the Chikù restaurant. The associations gave way to different imagery both for those from outside and for those who live there. The Green Thumbs (mostly in the Corto Maltese Park because they were born and live there) was born after seeing associations. They were motivated by; **2. The constant work of the police,** which over the years has curbed drug dealing. Many drug dens have been dismantled. This operation, however, has generated unemployment. Today, the area of the lot is starving. Even if today, perhaps, there is citizenship income, even if it is not easy to access for all, many have things in their names (*magagne: flaws*), even if not their own.

B. Perspective on the ongoing transformation

3. Do you frequent any association? Since when?	Recently, I worked for Dream Team Donne in Rete group. I was president of the Bandabaleno association. Then I broke up with the girl from the association, GRIDAS, in the carnival. I have never worked only for an association, I have also been volunteering for Patrizia Palumbo, I am independent. Even at the Hurtado centre. I get off in the car for half an hour, the metro closes at 11, to get out I go to Scampia.
4. When did you start doing street art? Did hanging out in Scampia help you in this process?	I've only ever done graffiti, I started when I was 12. Coming into contact with GRDAS and Mammut, I was influenced by Felice Pignataro and German writers because they used to spray and paint. I adopted that technique, and I did the same with the kids. With the kids, whether old or younger, that we drew together at the Cianfa lotto P alle Vele, they did it with spray cans, and from this experience, a long lab was born at the Mammut "Art a part": research on how to make art with other tools. Both Mammoth and I needed to know how to read the street, and our key to reading it was to use all the tools as

	urban art, and that year a book came out called URBAN ART put together through the techniques they use.
5. It seems that Scampia is the greenest neighbourhood in Naples, but the Ciro Esposito park has long been a dangerous place. Which parks are safe? Which are the ones where it is still not safe to go?	The park of Monte Rosa was not frequented, and I do not frequent it, but after the action of the Magma group and now you feel like going there (2020), different perception both for those who deal and for those who come from outside. **It's not just putting up the bench, but it was a collective process after experiencing that space constantly. I go there after working on it for a long time**. The Villa Comunale, which is now Ciro Esposito Park, I like to go there because it's beautiful, it feels good. The Corto Maltese Park is also beautiful. Chalet Bakù is a park I don't want to go to, but maybe those who live there will go there. Most of the parks in the neighbourhood don't give the feeling of being open to the public, but only to those who live there.
6. What services are missing in Scampia today?	**Everything is missing**. Perhaps because over the years, people become more demanding. **It would be great to have a cycle track** because Scampia is flat, even just in Scampia. Then you wouldn't have to risk death if you wanted to ride your bike. A skate park would be a reference point for urban culture. Equipment for outdoor sports too.
7. Where do you go to spend some leisure or relaxation time?	To the Villa Comunale or to the Mammut square. Then sometimes, in the afternoon or in the morning before going down to Naples, I go to the Mental Health Centre for daytime activities, and I would go to do the ceramics workshop. and they would ask if I was a patient too!
8. What do you think, and what do people think about the demolition and renovation of the Vele?	**I believe that tearing them down would have been necessary to bring down the symbol of decay.** I imagined when a dictatorship falls, you destroy the statues, the symbols. Over the years, Vele has become that symbol, for me too, because I used to go in there and see and know what I was and how I lived. Over the years, I have been confronted with others and matured critical thoughts. **Some of the proposals that seemed crazy, such as houses for students, cheap houses for young people, making work hubs, rather than tearing them down, why not transform them? I do not have an answer.** Tearing them down may seem like a solution because they are a symbol. However, moving away from the political discourse, it seems a bit speculative to tear them down. Much money to rebuild, but what? New houses in dormitory districts. They are building houses that in my opinion, are not very well made. The yellow houses (new social housing in the lot L Ed.) are better made even though they have nothing special. The white and grey, and red buildings (other social housing buildings Ed.), are smaller and are made worse. The walls are full of infiltrations, so much so that I could not make a mural. So much so that before the demolition, I thought, what is the difference with other houses? **"Isn't it better to have a nice museum?!"** There are architects from outside Scampia who are against the demolition. Often they are outsiders. Then there are people from *Centro insieme* who also started thinking: but why not renovate them? But very few. **Most believe that by knocking down the Vela, the neighbourhood can change.**
C. A vision for the future of the Vela B and the Lot M	
9. The Vela celeste will be renovated. How do you imagine it in the future?	For me, it should be a museum. I have seen the Tate in London, and there are bars etc. The city is already full of semi-empty offices. ASL

	(Azienda Sanitaria Locale) in front of the Mammoth has huge rooms one person, who maybe does not do desk activities all the time there.
10. And the public space?	I'd like to have more benches, a drinking fountain because if the junkies are no longer there, it would no longer be just for them. Also, I imagine a park-like Parc Guell, a place for art, walls made for graffiti, with a museum. With greenery. Scampia has more football pitches than the whole of Naples.
11. Do you see your future in your neighbourhood? What are the obstacles?	Million-dollar question. I do not know. If I had a job there, I'd live there no problem. To pursue personal projects, now I am in Spain, and I'm trying to work here. Before that, I was in Secondigliando.
12. Are you familiar with the idea of the circular economy, which creates new goods and jobs by recovering waste? From reuse to creative recycling, but also on an industrial level, who do you think it is possible to collaborate with in Scampia to create similar projects?	A small farm at the Hurtado Centre produced bags by recycling coffee sacks, but they are not sold in Scampia. GRIDAS for the carnival recovers material to make floats. The Green Thumbs recovered trees to make things in the Park. Also, a project they used to send children to school to make slightly larger shopping bags.

10. SUBJECT: Auto-organization. A case of creative self-management of an empty space in the Vele

INTERVIEWEES: Enzo Crispino and Antonio Brandi, inhabitants of the Scampia

I heard that you are making a self-managed recording room. (beautiful, congratulations)

1. Why are you doing in the Vele?	Enzo: We are creating a recording room, a space to give free rein to art. We're doing it to let off steam on a beat. Being from Scampia, we have to fend for ourselves to do productive things for us free guys. Antonio: We feel we have to do it to make people change their minds about our neighbourhood
2. How many of you are working on it? How are you organised?	E: I am the project leader. I'm the one who came up with the project with the help of Antonio. We have the same dream, we found each other, and we're creating something beautiful for the neighbourhood. A: My brother and brother-in-law Enzo and I are working on it, and little by little, with a bit of sacrifice, we are finally putting into practice what we have been thinking about for a long time: that is, creating not only a music studio, but also a place where we can get together and let people know that the sails are not only home to organised crime and various other bullshit that they spread about us, but that there are also young people like us who want to redeem themselves and let people know that their home is not as they paint it.
3. Are there other self-managed creative or cultural activities in the Sails? if so, which ones do you know?	E: Davide Cerullo ran an association until before the demolition of the green sail (Vela A), which took boys/children off the streets and from the underworld. Then there's the Mammut. A: not at least until our arrival.
4. Would you like to be financed by the municipality or have an official concession of space to do your own business?	E: it would be nice to have help from the municipality, but then I think that if you don't make sacrifices, you don't feel like you own something afterwards. I would not change the place where we are creating this creative space. We want to BRING SCAMPIA UP. A: It would be nice to have something official, like an open space where guys who maybe want to learn how to keep time to throw some real shit on a beat, where they can confront each other, throw ideas on the ground, discuss what they would like to improve about the place they live in. you get the idea. I just want to realise my dreams because they make this crude reality better.

Annexes to Section 6: The Bijlmermeer

Visits on site: Notes

N.	Day	Where	Purpose and fieldwork
1st	Jul-202020	Bijlmermeer centre	First stroll through Bijlmermeer, from west to the east side.
2nd	Aug 2020	Visit the K-buurt	Understanding the area.
3rd	Sep 2020	Visit the Bijlmermuseum exposition place	Study of the history of the neighbourhood.
4th	Oct 2020	Visit the site, the park and the street borders	Study of the atmosphere, urban services and the connections of the area.
5th	Nov 2020	Visit to K-buurt, Gooiord, Kleiburg	Observation of the kind of activities at the ground floor and meeting points in the area.
6th	Nov 2020	Visit to K-buurt, Gooiord, Kleiburg	Life in public space in the Bijlmermuseum
7th	Apr 27 2021	Visit Kleiburg and the park	Life in public space in the Bijlmermuseum

Interviews on Bijlmer case study

1. FOCUS ON: Entrepreneurship and the role of ZO! City in Bijlmermeer

INTERVIEWEE:
Saskia Beer, architect and enterpreuner

1.

1. **Can you tell me about how** ZO! City was born, how it started, what did with the local community and how? Which fundings or grants? How it got involved the

What is different in the project of TransformCity?

What have been the most meaningful experiences as an entrepreneur in Bijlmer?

I would like to know your considerations about Bijlmermeer. I am also interested in the relationship between architecture and public space with people who live there.

Story of Bijlmermeer renaissance from the point of view of an Architect.

So, considering the experience in Bijlmer. What happened in Bijlmermeer for the improvement of social life?

Something meaningful, from your point of view, is happening in Bijlmermeer for social innovation?
The role of the district today in the new “Doughnut city” model adopted by the Municipality of Amsterdam to operationalize Circular Economy and make Amnesterdam fully circular by 2050. I found really interesting that in this new city model will adopt the Donught Deals (that I still don’t fully get what are) they say have been created in Bijlmer, and also the Municipality will adopt the Living Lab approach in public policies.
What do you know about it?
What can be the role of this unique district for the transition to the donught city model?
Do you know some significant circular economy practices for social circular economy?
As architect, what do you think of the relationship between the built environment and the social issues that happened in Bijlmermeer?
The old Bijlmer is now a museum. Have you been working directly in that area?
What are the central values of the neighbourhood today?

2. FOCUS ON:
City of Amsterdam circular economy politics in Bijlmermeer
INTERVIEWEE:
Richard Ruitenberg, Gemeente Amsterdam - Senior adviseur Energie en Circulaire ontwikkeling

3. FOCUS ON:
Kleiburg renovation
INTERVIEWEE:
Kamiel Klaasse, architect – NL architects

Audio

4. FOCUS ON:
Kleiburg renovation
INTERVIEWEE:
Xander Vermeulen Windsant, XVW architects
Audio

5. FOCUS ON:
Cultural view of the neighbourhood
INTERVIEWEE:
Daan Dekker, writer
Audio

6. FOCUS ON:
Social housing management
INTERVIEWEE:
Marlou Steenbergen, Rochdale

1. Personal considerations on Bijlmermeer

How long have you been working in Bijlmermeer?	I work about 18 years for Rochdale; and about 10 years for the Bijlmer.
Has the perception of the place changed over the years? If yes, how much and how?	On average, the Bijlmer is doing better than in the past, but if you look at smaller scale (neighborhood level) the classical Bijlmer high-rise is doing much worse than the neighborhoods that are renewed in the period 2000 – 2012 (this neighborhoods have a better mix of social housing, owner occupied homes and free sector rent.). The Bijlmer flats (high rise) in the Bijlmermuseum (even Kleiburg!) have a bad livability.
Do you know of any recent urban regeneration project in the Bijlmermueseum area? If yes, which one?	The flats Geldershoofd en Gravestein (G-buurt Noord) are our most problematic flats. We are going to regenerate them (start in 2023 till 2025).

2. Residents and inhabitants

4. Currently the old Bijlmermeer area has become a *museum* area (Schilt and van der Werf, 2016).

Tab.2 Medium rental today (14-12-2020) and 31-12-2013

The lots are mostly residential with a mix of functions for residents.

How changed the value of the apartments over last years?

Are the apartments entirely on rent as social housing?

Tab.4. Average netto rent of social housing and rental price free sector.

Are there vacancies?

No, there are no vacancies. There is a long waiting time before you can get a social house in Amsterdam.

	Vacancies at this moment
GOOIOORD	5
GROENEVEEN	2
GRUBBEHOEVE	2
KIKKENSTEIN	3
KRUITBERG	1

This vacancies is because of mutations. The apartments are rented out within a few weeks (this is because of the rent-process).

Change in the market value of the apartments

Did the value of the apartments in the area changed after the Kleiburg restoration?

We didn't notice. We didn't sell apartments in the direct neighborhood. All the values of apartments increased in Amsterdam, because of the market.

Did new residents from other neighbourhoods move here?

In Kleiburg they did, but not in the other buildings. A lot of people with a small budget, became capable to buy a house in Amsterdam. And also investors bought apartments in Kleiburg. The problem is that some of the people who bought in Kleiburg, were not urged to go to live there, so they rent out to AirBnB, and labor migrants (p.e. 6 people in 1 apartment) etc. That's why the last years the livability went backwards in Kleiburg.

Did the social-mix rise over the years?

It depends which neighborhood you consider. And which period you consider.

The Bijlmermuseum in the circular policy context of the city of Amsterdam

Today Bijlmermeer is part of the process of the circular/doughnut economy transition of the city of Amsterdam.

Do you know of some circular economy initiatives/actions/redevelopment in the Bijlmermuseum area?

The Bijlmer (including the Bijlmermuseum) is getting rid of the gas. For heating, they use already "Stadswarmte", but the people still cook on gas. Th next 10 -15 years they will remove the gas from the apartments, so people have to cook electric or use induction.

Tab. 1 How many apartments are in the buildings

	Apartments	SOCIAL rent
GOOIOORD	394	391
GROENEVEEN	389	389
GRUBBEHOEVE	166	159
KIKKENSTEIN	411	408
KRUITBERG	353	337

Tab.2 Medium rental today (14-12-2020) and 31-12-2013

	Apartments	**Average surface (GBO)**	**Average rent appartments 2020**	**Average p. y p m2 2020**	**Average rent appartments dec 2013**	**Average p. y p m2 2013**
GOOIOORD	394	83	€ 594,0	€ 86,2	€ 485,0	€ 70,4
GROENEVEEN	389	88	€ 599,4	€ 81,8	€ 501,4	€ 68,5
GRUBBEHOEVE	166	83	€ 589,2	€ 85,0	€ 480,7	€ 69,4
KIKKENSTEIN	411	86	€ 587,6	€ 82,2	€ 481,2	€ 67,3
KRUITBERG	353	87	€ 585,3	€ 80,9	€ 487,5	€ 67,4

Tab.3 Valuechange last 4 years (vacant value)

	2017	2018	2019	2020
GOOIOORD	€ 142.231	€ 177.386	€ 197.946	€ 234.391
GROENEVEEN	€ 149.468	€ 181.470	€ 196.634	€ 227.285
GRUBBEHOEVE	€ 142.568	€ 164.884	€ 203.133	€ 229.925
KIKKENSTEIN	€ 142.690	€ 165.377	€ 193.234	€ 223.226
KRUITBERG	€ 139.993	€ 161.906	€ 195.031	€ 225.615

Are the apartments entirely on rent as social housing?
Mostly, not entirely

Tab.4. Average netto rent of social housing and rental price free sector.

	Social housing	Average netto rent sociale huurwoningen	Vrije sector	Average netto rent huurprijs vrije sector
GOOIOORD	391	€ 591,1	3	€ 974,2
GROENEVEEN	389	€ 599,4	0	-
GRUBBEHOEVE	159	€ 573,3	7	€ 951,2
KIKKENSTEIN	408	€ 586,0	3	€ 806,5
KRUITBERG	337	€ 570,2	16	€ 904,1

Curriculum Vitae

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QGis
Office (Word, Excel, Power Point)
Atlas.Ti
MCDM softwares (Superdecision, NAIADE, Promethee)

SHORT BIO Architect graduated from the University of Roma Tre and International Master "Architecture History Project". During the career, I have been a guest student at the Faculty of Architecture and Urbanism of the Universidad de Chile, at the Escuela Tecnica Superior de Arquitectura de Valladolid (Spain). I spent a research month in Athens (Greece) for my graduation project.
I worked as an architect in Italy, Spain and Chile, and at different scale projects, in architecture and urban design (2015-2016) and the installations for the Venice Biennale (2016 and 2017).
Currently, I am a PhD candidate in Evaluation and Urban Planning at UNINA and a guest at TU Delft. My main research interests are in evaluation processes through tools and multiple approaches to operationalise circular city. I study the interplay of urban metabolism study, built environment, and place-community collaboration in spatial decision-making contexts, using multiple-criteria evaluations with a transdisciplinary approach. The PhD research focuses on the wastescape regeneration, improving urban metabolism and the adaptive reuse of waste building stock involving local actors and stakeholders. I am interested in connecting the multiple dimensions of the waste phenomenon (spatial, material and social), linking circularity with environmental and spatial justice with attention at urban outskirts. Crossing tools and methods, I implemented the Geodesign methodology in some workshop. I have been part of the UNINA research group in the h2020 REPAiR project.

In recent years, parallel to my PhD research, I have collaborated with:
- Colla (Collaborative in learning and action), realising the TU/TTO project funded by the Direzione Generale Creatività Contemporanea, Ministero della Cultura, with the Creative Living Lab II edition. The project has been developed in Naples in collaboration with local associations and the CNR;
- Association Kinetta Spazio Labus in Benevento, in the collective audiovisual project, Tales of the balcony, during the first lockdown of 2020. The Final Chapter was a finalist at the Confined Urban Vision 2020 festival;
- Louis De Cicco, musician, on a project on urban metabolism sonorisation selected by ZKU (Center for Art and Urbanism) in Berlin for a four-month residence for the following year.

Presentations in national and international seminars, conferences and lectures

2021.25.03 Title: Bijlmermeer and Scampia: The potential of suburbs as centralities in sustainable and circular cities.
Authors: Chiara Mazzarella, Hilde Remoy
Conference Crossing Boundaries 2021
Presenting author at Parallel session 4.2

2021.15.03 Title: Il Geodesign come Strumento Spaziale di Supporto alle Decisioni. La sperimentazione in RE-PAiR per la gestione degli scarti metabolici e territoriali.
Lecture with Maria Somma
Ciclo di Seminari del Laboratorio "L'intervento integrato nel territorio contemporaneo" CdS in Sviluppo Sostenibile e Reti Territoriali - SRT. DiARC UNINA
Online seminar and workshop in MS-TEAMS

2020.09.18 Title: Wastescapes disservices: criteria and indicators for the evaluation of circular city resources
Authors: Maria Cerreta, Chiara Mazzarella
CONFERENCE URBANPROMO GREEN 2020
SIEV Online Seminar "Close the circle? Evaluation models for a truly circular city"

2020.07.1 Title: Opportunities and Challenges of a Geodesign Based Platform for Waste Management in the Circular Economy Perspective
Authors: Maria Cerreta, Chiara Mazzarella, Maria Somma
ICCSA 2020 - 21st International Conference on Computational Science and its Applications
Session: Geodesign in Decision Making: meta planning and collaborative design for sustainable and inclusive development.

2020. 05.21 Discussant at "La vivienda minima es inmoral?"
Lecture of Antonio Ledesma
Report from home. Online Conferences curated by Gioconda Cafiero, Paolo Giardiello Marella Santangelo. Organized by DiARC and Dipartimento degli studi filosofici (UNINA)

2019.06.23-26 Title: Assessing Urban Vulnerability: The potential of Multi-Criteria Spatial Decision Support Systems
Authors: Giuliano Poli, Maria Cerreta, Chiara Mazzarella and Stefania Regalbuto
EURO 2019. 30th European Conference on Operational Research, UCD Dublin, Ireland.

2018.12.10-14 Title: A hybrid decision-making process for wastescapes remediation: Geodesign, LCA, Urban Living Lab interplay.
Authors: Maria Cerreta, Chiara Mazzarella
Fourth International Symposium of Routes toward sustainability. "CULTURES AND LOCAL PRACTICES OF SUSTAINABILITY. Intersecting Multiple Footprints and the Environmental Humanities."
Pontificia Universidad Catolica de Chile, Campus San Joaquin Santiago de Chile e Villarrica.
Session: Local Practices of Sustainability - Presenting author.

2018.9.5-9 Title: Collaborative decision-making processes for an autopoietic wastescapes regeneration.
Authors: Maria Cerreta, Pasquale Inglese, Chiara Mazzarella
Selected speaker at 10th International Conference on Innovation in Urban and Regional Planning Environmental and Territorial INPUT2018. Modelling for Planning and Design.
Dipartimento di Scienze Agrarie e Forestali - DAFNE, Viterbo, Italia.
Special session: Geodesign

Publications

ORCID: https://orcid.org/0000-0003-0940-0695

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Cerreta, M., Inglese, P., & Mazzarella, C. (2018). A hybrid decision-making process for wastescapes remediation. Geodesign, LCA, Urban Living Lab interplay. *Environmental and territorial modelling for planning and design, FedOA Press, Naples, Italy*, 603-610. http://dx.doi.org/10.6093/978-88-6887-048-5

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