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COVID-19 (Forced) Innovations

Pandemic Impacts on Architecture and Urbanism

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Chapter 1
Introducing the Implications of the COVID-19 Pandemic on Urban Design, Architecture, and Residents' Behaviour

Fabio Naselli and Anna Yunitsyna

Abstract The COVID-19 pandemic marked a threshold in everyone's life, consequently generating new spatial-social (forced) innovations in the spheres of both architectural and urban thinking. The relationship between humans—and space—and humans became a major subject of interrogation on a kind of new normality. The pandemic context required distant communication, remote working/learning, and physical/social isolation. Considering the possibility that similar kinds of events might repeat, the process revealed naturally certain lessons from which we must learn. First, it revealed the role of public spaces as an essential place of spatial quality, which became quintessential in such a circumstance. Their design and reconceptualization, especially in spatial-functional terms, ask to be reconsidered. Especially in mass and multifamily housing developments, their presence quantitatively and qualitatively needs to be reconsidered starting from the real human scale. Interestingly the remote working and teaching processes were also tested during the pandemic, from what we learned there are a lot of pros as well as criticalities in the distance working/learning process, not only in professional aspects but also in relationships and people interaction aspects. Although it pushed toward more virtual reality, the pandemic worked as a "live" experience to understand the potential and the extent of digital technologies in making such a reality possible. Last but not least, the lesson was related to the personalization of space through isolation, to avoid the spread with preventive reasons. In this respect, several experiments have been proposed; however, the nature of this operation on its own is featured by ontological limitations. Finally, it can be said that these lessons should rapidly be reflected in architectural and design pedagogical processes aiming to train the next generation of architects/urban planners toward a new normality, foreseeing that the reflections should be implemented in the curricula and courses of architecture/engineering programs, to forerun future similar situations with adequate approaches.

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Keywords COVID-19 · New normality · New design paradigm · Forced innovation · Architectural adaptation

1.1 Preamble

In September 2020, Nabil Mohareb, a colleague from the Beirut Arab University, published a very reflexive paper titled "Has an Urban 'new normal' become necessary following the coronavirus pandemic?" (Mohareb 2020). It was the starting point, just once we were in the first steps of re-opening our lives to a post-new normal. In the subsequent two years, the many months we spent in lockdown and the several spent in a state of limitation in both physical and social dimensions have questioned the well-consolidated models of habitat and spaces in which we daily live and act. Then the pandemic has even stressed all critical issues globally, highlighting city limits, infrastructure, architecture, urban and local spaces, facility provision, and human lifestyles (Armondi et al. 2022), characterized by archetypes and paradigms that appear now as obsolete or, at least, need a review. However, whether we experienced those strong social-physical limitations, on the one hand, we faced a huge enlargement in the digital non-physical dimensions, on the other hand. As an early result, we are now struggling in the search for a suitable new equilibrium between "real" and "virtual" lives. Between the Human City and the Digital City. This meant that the cultural debate—in the fields of Architecture and not only—took place oriented on the importance of planning, investment in research, and the need to activate open innovation dynamics, highlighting the social, economic, and environmental impact of innovative, sustainable, neo-anthropocentric, and eco-centric measures.

1.2 Introducing the Implications of the COVID-19 Pandemic on Urban Design, Architecture, and Residents' Behavior

The Global Event that affected the world in early 2020 left some extended effects in many design fields, from urban to architectural scale, from engineering to industrial design, forcing designers to rethink some consolidated codes and familiarize themselves with the old conceptual approaches. By observing this manifestation from the given short-time post-viewpoint, we can see that some of those changes have been temporary and predestined to be retrieved back to the old normal in a short time; basically, once the "innovative" motion is passed away. Differently, some other of these changes look fated to become more permanent and able to challenge or change our individual and social mindsets as designers and end-users, as well as influence the whole set of old-normal "consolidated" codes, perhaps forcing us toward a general advancement in architecture and urban planning.

Furthermore, those "forced" changes have even more stressed the sense of transdisciplinary interaction among the diverse fields of knowledge—not only in the design approach—acting as an upward cross-cutting set of "innovations" able to answer more focused inquiries about pandemic post-time approaches. Innovations that affected people's real-life entire realm at a global scale suddenly left us the legacy of new normal traces to follow up (Hughes and Armstrong 2020).

The book aims to provide deep "think tank" momentum (dated November 2021) by arguing and remarking—in a large arena and through many contributions—how we have been challenged and what we are earning in the switch between the new and the old normal post-2020. Picking up among the fringes of the experienced period—as it ripened almost two years and a half later than the beginning of the pandemic era—the book strives to explore what was and is going on in the after-pandemic era of designing in both practice and research.

The topic of the subsequent new normality became an emerging trend that influenced all spheres of private life and work. The new restrictions are applied at different levels, starting with the spatial division of the countries into colored zones, cities into districts, and spaces that are limited by the social distance rules. The issue of post-COVID architecture is nowadays relevant, and every country must find the best strategies to mitigate the disease (Just and Plößl 2022). It brings together socio-economic, ethical, health, design, and cultural aspects. Since the nature of pandemics is the same all over the world, this research is a source of information and inspiration that is applicable in various cultural and economic contexts. There are few studies on the New Normality that have been published since the end of 2020; therefore, this book fills the gap with awareness by bringing the latest research in the field of architecture and urban design.

This book gives an overview of the shifting paradigm from the traditional design techniques and standards to the new values and methods that occur for tackling the global pandemic rules. However, whether we experienced those strong social-physical limitations, on the one hand, we faced a huge enlargement in the digital, not-physical dimensions. As an early thought, worldwide thinkers are now struggling in the search for a suitable new equilibrium between "real" and "virtual" lives, between public, private, and collective open spaces, between the Human City and the Digital City. The theoretical studies of the phenomenon of the New Normality in architecture, urbanism, and the social sciences are a source of adaptive inspiration for researchers, professors, and students in the fields of architecture, urbanism, and interior design (Montoya et al. 2022; Gillen et al. 2021). On-site applications of the post-COVID structures, indeed, can be interesting for students, practitioners, developers, and city managers. The issue of online design teaching and learning provides a set of practices that can be applied both by educators and trainees. The book is also useful for readers who are interested in recent trends in architecture and interior design, since it provides a deep analysis of the recent changes in architecture aiming to make the environment disease-free and to make the space habitable during the long period of the lockdown. In the last two years, the many months we spent in lockdown and the several spent in a state of limitation in both physical and social dimensions have questioned the well-consolidated codes and models of habitat and spaces in which we daily live.

Then, the pandemic has even stressed all critical issues globally, highlighting the city limits—infrastructures, architectures, urban and domestic spaces, facility provision, and human lifestyles—characterized by archetypes and paradigms that appear now as obsolete or, at least, in need of revision.

In the most acute phase of the health emergency, the crisis of Western cities (but not only) has been of such magnitude as to lead many scholars to hypothesize the overcoming of the prevailing urban models, both in structural aspects (types of private dwellings and public spaces, distribution of services and road systems, and so on) and in the ways of working and being together (UNESCO 2020). That is to say, several scholars from different disciplinary perspectives wondered early on whether the health emergency might constitute a prompt to change the characters on which urban development has been based in recent times, and many sociologists, planners, geographers, and policymakers, on the one hand, investigated emerging social needs (through surveys and qualitative research); on the other hand, in their reflections, they expressed caution in assuming radical change, arguing instead that time would tell whether the then-recorded social need to pursue the goal of achieving a proper balance between urban economy, nature, and health would be stable and enduring. At the present stage, strong skepticism prevails that from the health emergency, politics first and foremost, but also society and the economy have learned lessons aimed at correcting social behavior, economies, and organizational models, even though the health crisis has not come to an end (at most it has been 'hidden') and continues to overlap with the well-known environmental crisis, primarily that resulting from global warming. Despite the more than well-founded skepticism, it is incumbent on those who study these issues to insist on the need to "radically" change the approach.

1.3 Book Presentation

The main objective of this book is to learn about the emerging transcultural (and trans-contextual) approaches as they were raised—unsystematically and suddenly—to provide the first resilient answers to the unexpected shock.

The several arguments raised from the arguing of different study cases, diverse theoretical approaches, and the tests and solutions put in place in a short time and various of the world's contexts enriched the ranges of this book by stimulating an interesting intrinsic debate that crosses through the pages of it.

By exploring and hearing about the last case studies, the growing new theoretical approaches, and, finally, those collective experiments and practices, even informal, often spontaneous, and usually not codified, which took place in the "first hour" of the event, the book is a medium to reflect on how design-thinking evolves in special circumstances, like the pandemic, in the effort to rebalance and update consolidated "praxis and experimentation" to fit the better quality of life. As well as a growing motion to expand both concepts and meanings of "places and spaces"—fitting those concepts of proximity, such as those that emerged from the recent experiences of "living spatial limitations" and "social isolation".

This book is divided into three parts; the first focuses on urban planning and design challenges; the second explores design and building typologies; and the third part opens to the post-COVID effects on cultural, educational, and social aspects as well as the citizens' well-being. An introduction section by Naselli and Yunitsyna specifies the sense of the whole book and the added value of connecting the different parts, topics, and themes in one text. Also, in the ending section, an afterword by Manahasa tries to outline the real achievements of that cross-cut narration through all the contributions.

In more detail, Part I deals with those COVID-19 challenges and post-pandemic reflections on the urbanism field. What happened and what are the positive as well as negative effects in terms of the blue environment within our cities is the topic treated in the first chapter by Naselli et al., focusing specifically on the city of Tirana by referring to the related UN-SDGs. Calace et al., in the following chapter, lead readers to a problematic condition where the theme of distancing raises new questions about density, regeneration, and the need for new spaces within every urban context. The concept of proximity in post-pandemic urban planning is also treated in the fourth chapter by Geropanta and Porreca, exploring the topic through the 15-min city and the Superblocks concepts and practices. Franchino and Frettoloso, in Chap. 4, explore the opportunities for urban space to become, on the one hand, an important reserve of space, and on the other hand, to mitigate the issue of social distancing and enhance the ideas of the New Normality. The sixth chapter gives room to Antonio Acierno, with the chapter, European coastal areas and opportunities for sustainable transformations in post-COVID Society exploring the value of ecological planning for national and international coasts and trying to analyze whether contemporary cities are effectively managed and designed to meet the economic and socio-recreational expectations of the users. Concludes the first part an interesting opening to the inland areas in the resilient countryside, raised as better places to spend the limitations and often considered as a shelter for the pandemic and other shocks. This chapter brings us to the process of sustainable revitalization of inland areas by Angrilli and Ciuffreda. It focuses on the Green Communities and Ecosystem Services answers in the post-COVID era.

In the second part, the induction of changes in design strategies and building typologies due to COVID-19 is the focus theme. The chapter opens with an exploration of the opportunities for the use of digital tools for "distant" participatory design and their practical implementation; Kim et al. share their practice in South Korea. Following this, Sicignano et al. deal with the rethinking of the design parameters of the schools, which should satisfy the limitations caused by the pandemic. In Chap. 3, Ibraimi and Saliu set out a proposal for new design guidelines to transform learning environments, based on the observations of 12 schools in North Macedonia. The Pandemic brought into use new building typologies, such as testing units. Pietrogrande and Dalla Caneva tell us about a study for a mobile medical testing unit and the possibility of installing such small mobile services in historical areas of the cities. In the fifth chapter, Yunitsyna and Fallanaj develop a series of housing typologies with the use of shipping containers, which are zero-energy, transportable, and easy to mount in remote areas. They can easily face different types of crises. A new model

for the organization of the coworking space in post-pandemic conditions is presented in the competition proposal illustrated by Yunitsyna et al. in Chap. 6. Rashed et al. focus on the reorganization of world-famous tourist attractions, taking Luxor, Egypt, as a case study.

The third part is aimed at understanding the social issues that emerged during and after the pandemic, the post-COVID effect on cultural, educational, and social aspects, and citizens' well-being. The holistic approach toward the well-being issue during the post-COVID period, with a special emphasis on the aging time is given in a collective paper written by Dantas et al. Hernández and Fernández contribute to the same topic by investigating the possibilities of the use of AI to investigate and prevent older people's social isolation. In Chaps. 3 and 4, Ozturk proposes the digital deconstruction of architecture as a new education model for teaching in architectural schools after COVID-19, while Lameiro shares his experience with the changes tested in the practical teaching of graphic design during the pandemic. The fifth chapter is about the complex relationship between the city–sea interface and urban coastal society after the COVID-19 crisis, written by Pistone. Bayoumi and colleagues open a new room—in the fifth chapter—shifting attention to current (past?) architectural code aspects related to the usability of a big international urban facility, the Bibliotheca Alexandrina. Questioning themselves: Do the standards created by this library meet the global social and political changes and limitations that have occurred since the spread of the COVID-19 epidemic? The establishment of social distancing caused changes in the use of the urban environment. The transformation of the Greek cities during the crisis is explained by Manika and Zervas.

The conclusions are outlined by Manahasa in a final afterword that aims to sum up—in a holistic synthesis—the lessons learned from the COVID-19 pandemic through different experiences, theories, experiments, and practices. These lessons should work as starting points to reflect in-depth on the redesign of indoor and outdoor spaces, on the reshaping of remote professional and pedagogical processes, and on the redefinition of disciplines' personalized spaces in the new reality of the post-pandemic context.

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Part I
COVID-19 Challenges and Post-pandemic Reflections on Urban Design

Chapter 2
Density, Regeneration and the Need for New Spaces

Francesca Calace, Alessandra Rana, and Chiara Vitale

Abstract In cities and metropolitan areas, marginal and degradation conditions can be found everywhere, even in the most central spaces. In fact, the concept of periphery based on the distance from the center seems outdated, associating the term with the deprivation of rights, like the "right to the city" and the opportunities it offers. Moreover, nowadays taking care of the existing city seems to be an unavoidable necessity to restore quality, accessibility and safety completely neglected in decades of development; this need becomes even more urgent when events like those experienced in past years require to rethink ways and spaces of living together. Lastly, we can consider that the place-based approach for the transformation of "internal areas" can be related to an inter-urban scale to strengthen social cohesion and promote local development even in interstices and marginal areas inside the city. From these reflections, among the urban environments to be rethought, here we suggest to deepen the theme of the historical peripheries, in which there are typical and peculiar conditions that make them paradigmatic of a contemporary condition, complementary to the dispersion and loss of urban form: high degradation of the building stock, which has reached obsolescence in many parts, combined to the persistence of historical and environmental values; high density corresponding a chronic underdevelopment of services and collective spaces; a social unease caused by a combination of poverty conditions, subculture non-integration of immigrant communities; all situations in which the "right to the city" seems to be denied. Today, in a problematic condition where the theme of distancing raises new questions about density as a value, the theme of inner peripheries, as symptomatic of the city unease as its complementary phenomenon of urban sprawl, requires a specific, place-based approach, attentive to material and immaterial characters, as well as the urban form and living conditions.

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Keywords Historic peripheries · Urban regeneration · Local identity · Post-pandemic

2.1 Introduction

The etymological meaning of the word "periphery" as outline, edge, thus the most external and marginal part of a physical space, as opposed to the center (Treccani 2022), now betrays the complexity of these spaces whose existence reason is not limited to the geographical remoteness from the core. The periphery has a social and physical dimension, which can be understood as the spatial manifestation of social problems of the city, such as isolation and degradation (Waquant 2007). However, we face the risk of falling into the trap of territorial stigmatization if we refer to it only in these terms. For this purpose, it may be useful to define the periphery by the complex of its identity and characteristics as well as its components—environmental, social, historical, cultural and of the settlement—and not by looking at just one of these aspects (Druot et al. 2007).

Moreover, while it is commonly perceived that the peripheral areas in cities were invested by a degenerative process in response to the ever-growing urbanization phenomenon, not all of them faced the same destiny. Indeed, the concept of periphery itself can be declined in different ways (Tabasso 2016). We can go from areas at the margins of urban centers, which do not experience the same autonomy and centrality as the principal one, to those that suffer from the lack of services and facilities essential for a quality urban life, through those areas degraded due to the obsolescence of the building stock or to the distance from the infrastructure (Boeri 2016; Tabasso 2016).

These types of peripheries, old and new, share in most cases the absence of spatial quality, reflecting in the formal precariousness a more intimate condition of the urban spaces in terms of accessibility, social discomfort, and levels of effective and perceived safety. Such aspects were often overlooked during the transformation process that invested the city in the past half century for a more convenient economic return. For example, in this timespan due to socio-political changes parts of the city was transformed both morphologically and functionally to make room for places of mass consumption. This produced a contraction of the "traditional" public space (Ischia 2012) and as a consequence, the loss of urban uses and proximity functions. In this sense, the city generates injustices—social, economic, spatial—(Prisco 2013) such as ghettoization, escalating poverty, spatial fragmentation, inadequacy of public services, decline of urban centers and gentrification. For this reason, in places like historical peripheries, the lack of "urban democracy", precisely the increasing presence of inequities caused by the proliferation of urban models built on conflicts and divisions—real or metaphorical—(Olmo 2018), makes even more clear how certain rights must be considered as inseparable from "democratic urbanism" (Amin and Thrift 2001). This calls for action on the socio-economic imbalances originating

such urban phenomena in order to intervene on a structural level on issues such as the spatial justice (Soja 2010) and the right to the city (Lefebvre 1968).

2.2 Historical Peripheries: Critical and Arising Issues

From these considerations, the contribution focuses on a more elusive declination of the periphery, difficult to recognize because of its continuity with the consolidated city of which doesn't own the same urban qualities (Gibelli 2005). Considering these many meanings of the periphery and given the intention to explore the city beyond its center, we intend to investigate an urban dimension often forgotten in favor of more pressing and visible issues. It seems essential to address this matter by trying to develop a reflection on the context of the historical peripheries and, in particular, on the "minor" urban heritage of the dense city which, however, constituted a significant part of the *extramoenia* urban development of Italian cities.

By historical peripheries, we mean those neighborhoods or city parts established in Italy at the end of the nineteenth century and shaped the way they are today until the first fifty-ish years of the twentieth century. They were then involved in the systematic expansion process of the contemporary urban development that peaked in the years of the "Italian economic miracle". Such processes caused the historical outskirts to be "absorbed" into the growing city and downgraded as transit areas, from and toward the most central ones, or to reach the main infrastructural network for territorial mobility.

The historical peripheries, whether generated through spontaneous or planned processes, are frequently constituted by recognizable urban settlement, with distinctive morphological and architectural features, often of great value, even if not protected or subject to regulatory constraints. Over time they become more and more peripheral in terms of life quality, services availability and accessibility, despite being no longer distant in spatial terms. The working-class and *petit-bourgeois* nature, which characterized their development, transformed over time into an increasingly and significant presence of building decay combined with social discomfort, together with the function impoverishment and a general sense of "emptying" of the neighborhoods. This perception may be linked to the loss of public space in its widest sense, due to the ongoing disappearance of commercial activities, local services, relational spaces and all those places that had made the neighborhoods vibrant and dynamic centers over time.

The combination of these aspects can lead to the recognition of some typical traits of a condition, the urban shrinkage, which is becoming more evident even in South European countries like Italy.

Although the phenomenon is usually associated with very conspicuous manifestations, as in cities like Detroit, Tokyo, Leipzig, due to the collapse of the productive system or to natural disasters, if the causes are different, as in the Italian context, urban shrinkage manifests itself in a more silent and crawling way. The main problem is seen in the erosion of the economic structure in a certain territory, which generates

the crisis of traditional urban models and affects the social and spatial structure of the city. This means that the perceived sense of emptiness in historical periphery, even if not actually backed by the "typical" demographic decline, can be related to other forms of loss.

The loss is the most obvious trait related to urban shrinkage and therefore more widely recognized. It manifests in different ways in relation to its intensity: from the emptying of neighborhoods of their regular users with loss of resident population in favor of temporary inhabitants because of the presence of territorial attractors or of the strong touristic fluxes, to the displacement of activities in more attractive areas, up to the replacement of essential services more profitable and, all this considered, to the negation of the right to the city.

This recent but relentless ongoing metamorphosis translates into a clear loss of the city's identity along with its historical stratification and the erosion of the supporting urban structure.

The attentive eye of the observer can see how in these places the human value is getting poorer, despite the high population density and the strong presence of identifying and symbolic values as cultural, social, architectural, which make even more necessary to restore these parts.

2.3 Bari (IT), the Case Study

To explore these aspects, it is introduced the case study, specifically the City of Bari (IT) with its historical peripheries, with a spontaneous genesis that defined over time recognizable, distinguished but now poorly conserved settlements.

The south area of Bari's central railway station (Fig. 2.1), recognizable today in the Carrassi, San Pasquale and Picone districts, was not born through specific, organized and detailed planning, but has spontaneous origins. Over time, these origins defined recognizable and distinct settlement units, although not protected today, becoming, in the course of urban transformations, increasingly peripheral in terms of quality of life, availability of services and accessibility, but not in terms of space. Historically, the large agricultural area of the Bari countryside was characterized by the planting of olive trees and the presence of exclusively rural and agricultural buildings.

At the beginning of the 20 s of the nineteenth century, close to the railway, the first signs of urbanization were born: this will develop throughout the century with a series of production plants of the rising local industry. Later, in the first years of the twentieth century, the first specialized buildings of a scholastic, military and religious nature also begin to pop up; the latter will be decisive for urban development. The construction in 1914 of the Orthodox Church of San Nicola in the Carrassi district marked a profound transformation, strengthening the distinctive character of the historic connection route between Bari and Carbonara and Ceglie, and becoming a reference and a recognizable element of the neighborhood. Another important religious event was the construction of the Catholic Church of San Pasquale in 1919. Over time, this element of the urban fabric has increasingly assumed a central position

Fig. 2.1 Permanences of the historical urban fabric, case study area, Bari (*source* authors)

in the neighborhood, both in spatial terms, generating an urban development around it, and in terms of social and cultural recognition.

The first 20 years of the twentieth century were a time of strong transformation of the area: in 1920 the first houses were built, through private land concessions, in the southeastern quadrant of the Carrassi district. At the same time, the San Pasquale district is also affected by the construction of the first residential cluster of the district, adjacent to the railway line, organized in large blocks on a regular grid.

The first half of the twentieth century is characterized by a strong transformation of the area and the construction of specialized structures, but above all sees the area affected by a strong growth of residential buildings. In the Carrassi district, the building logic appears to be disorganized, like a sum of pieces, through subdivision processes that gradually extended along the main axis of the district, now known as Corso Benedetto Croce. Its development was dictated by the historical matrix route of extra-urban connection, which connected Bari with Carbonara and Ceglie del Campo, branching off toward the east with a series of small residential nuclei resulting from unitary projects: such as the rare example of a garden city of the "Postelegrafonico" village (De Robertis 2021)—20 four-family liberty style villas for post office workers—and the IACP public housing complex—so-called Ciano due to the shape of the buildings.

The San Pasquale district, born as a residential area, has over time sporadic presence of industrial buildings along Via Amendola. Its residential function arose from the need to provide accommodation for all workers employed in the factories present above all in the Carrassi district. The residential fabric developed in continuity with the first housing unit, in an almost compact form, through a regular grid with an orientation defined by the two historical radial routes connecting with the inner centers: now known as Via Re David and Via Amendola.

The Policlinico, the bigger city's hospital, built in Picone in 1937 and the University campus built in San Pasquale in 1951 brought back life to neighborhoods and its infrastructures.

Their presence and the consequent formation of new structures and services has generated at the time an increasingly wide flow of city users, diversified but above all transitory, that have characterized the area modifying the inner social structure as well.

At the beginning the area was inhabited by the middle class, due to the high workers' presence; today this character has almost been lost in the entire area. The original population is now concentrated in the first historical residential areas, while there is a strong presence of people who live in there for a short time, especially students, healthcare workers and university staff. This condition can be underlined by the rate of non-resident housing which is calculated between 11 and 22%.

The new industrial district built outside the city in 1960 and the consequential desertion of the area's industrial facilities. This abandonment brought to an uncontrolled growth of the residential settlements, underlined by the increasing Carrassi urban density, today around 2300 ab/km^2. A massive transformation of the area was carried out by Via Unità d'Italia realization in 1970, after the demolition of part of the historical and architectural heritage. The massive fracture created by the new urban axis between Carrassi and San Pasquale was caused by its central position and width, defining a clear division of the two areas, in terms of urban continuity as well as of social diversity.

Urban policies and the various urban transformations applied through the years, brought to a services and functions impoverishment. These services and functions are embraced into Bari's urban transformations, but declassified as crossing areas, bringing to a high urban density and to a human relation's drop.

The uncontrolled construction characterizing the districts since 1960 defined a public space limitation. This has generated the total absence of places and green areas for the community, but sidewalks.

This condition forced the inhabitants of the neighborhoods to move to other areas in the daytime and evening, limiting the use of the area only at night, making these areas dormitory.

A key factor of degradation within the districts is the total absence of policies on preservation of the historical buildings. In fact, Carrassi and San Pasquale districts show an identical and recognizable architectural remain, which are the vanishing core of area's development.

There are still some cases of historical housing buildings, which appears strongly degraded, dilapidated and in some cases totally abandoned. Furthermore the industrial nature, which gave rise to the Carrassi district, completely disappeared.

The urban and social condition of these areas are due to the lack of protection and valorization policies. This makes them increasingly peripheral, in terms of usability of public space, quality of life, services and infrastructure, despite being immediately next to the central areas of the city.

2.4 Declinations of Urban Regeneration

As with the notion of periphery, the term "regeneration" also lends to a variety of interpretations, so it may be useful to outline how it is understood here.

Although in common language the term is used as sort of umbrella that covers many different types of measures (Barbanente and Calace 2021). These are mainly involving real estate transformations, with a certain attention to the social dimension of the intervention and of the intervention itself. Because of its origin, ascribed to Anglo-Saxon matrix, it refers to recovery and redevelopment programs of real estate at the urban scale aiming to ensure quality and safety of living both from a social and environmental point of view, especially in the most degraded areas of the city.

Consequently, the immaterial component—social and economic—is as relevant as the spatial one since it is impossible to pursue a real improvement of places conditions without considering these aspects as well.

In the historical and dense peripheries, inside the built city as in the analyzed case study, it is necessary to understand the necessity of regenerating in the indicated terms. This is due to the close relation between the spatial condition—a historical and testimonial heritage with a strong identity and architectural values, a condition of widespread degradation and lack of services, a high density of buildings and housing—and the social condition—a complex social context, made up of poor communities yet strongly rooted, overlaid by fluxes of workers and students, new ethnic groups. It should also be noted that this condition is now made even more problematic by the pandemic, which worsened the obvious deficiencies of the city in terms of housing, local services, available space for individuals and the community. If the urban regeneration, especially in these contexts, cannot ignore the specificity of places and communities, it seems useful to reflect on some ideas which have made the territory a starting point for the creation of urban policies.

So it is necessary to reconsider and update the place-based approach to the contemporary conditions, even post-pandemic. This has characterized the "new Regionalism" that emerged in the last decades of the past century (Salone 2012), of which is a tangible testimony to the orientation of European policies to activate a direct dialogue with the Regions, rather than with national States and, more recently, with territorial cluster for the development of policies for "internal areas".

A further reflection can be made—looking at these contexts in light of the discontinuity brought by the Pandemic—on the notion of local development, as defined at the turn of the century (Dematteis 1994; Magnaghi 2000; Trigilia 2005). This was not in order to "scale up" those policies to an inter-urban condition such as the one examined, but rather to grasp the essence of that approach and consciously operate even in such small territorial contexts.

In other words, in such contexts it is possible to build up policies focused on the specificity—territorial—of natural and institutional resources, as well as on the role

played by relations—material and immaterial—between places?[1] Can the place-based approach be usefully related to an intra-urban scale in order to strengthen social cohesion and promote local development even in the interstices and areas of marginality that are entirely within the city?

Aware of the limitation of the spatial approach alone to deal with these matters, we would like to try and identify how the contribution of urban design can be developed, to address the issue of urban regeneration of the historical peripheries. We will move, for illustrative purposes, outlining some knowledge and design criteria, made explicit within the research experience related to the case study assumed.

Starting from this posture, any regeneration intervention that affects these types of neighborhoods needs to focus on some essential assumption.

1. The reconstruction and public display of urban history—even a "minor" urban history, never covered in disciplinary terms—should be understood not only as a condition for operation and even less as an historicist in-depth study, but rather as research focused to understand the reasons for current order and recognize the traces of the past knowing how to secure them to their own historical processes and to the environmental and social context conditions. The traces, the artifacts and the surviving buildings from the establishment of these neighborhoods, recognized their historical reasons (Fig. 2.2), can assume the role of deep structure of the urban space, matrix of the urban settlement even if neglected by the present. Returning this history to the local communities, a story still alive in the older generations, can be an effective factor in revitalizing a dormant local identity.
2. The awareness that this profound structure has to be considered as a historical testimony to be preserved, should be associated with a further decisive objective: to make it the matrix and the beginning of a potential different organization of the current city (Fig. 2.3). This process of re-emergence and re-signification of the history traces which built the city in a design key, in the logic of local development is not a nostalgic attitude, but a forward-looking perspective (Marson and Tarpino 2020). The territory needs to be recognized as the common good of the inhabitants.
3. The fragility of traces of history, together with new demands of the present, made even more evident by the pandemic that revealed territorial fragilities, impose that regeneration projects do not rely exclusively on the recovery of memory, but measure themselves with the newness and experiment with innovative solutions and projects (Fig. 2.4). This can attribute new meanings to spaces, and this way escaping the ambiguity of identity as localism and defensive immobility (Volpe 2015).
4. The use of a fresh approach to the historical peripheries and the assumption of the objective of increasing social cohesion and promoting local development even in the interstices and in marginal areas internal to the city, requires to

[1] This definition of place-based policies (Salone 2012) is based on the recognition of the connection to local development and assumes the documents of the World Bank, the OECD, and the well-known Barca Report (2009) as references.

Fig. 2.2 Recognition and valorization of historical and architectural heritage (*source* authors)

Fig. 2.3 Development of the historical parts of the neighborhood (*source* authors)

Fig. 2.4 New public spaces and green areas (*source*: authors)

the urban planner to rethink the toolbox. This means abandoning—or strongly reducing—the real estate dimension in urban transformations. For decades, real estate represented the lever of transformation processes, a lever that neglected the historical peripheries and similar territories, focusing on the development of more valuable contexts. Meanwhile, the public authorities acquiesced, supported by urban plans roughly addressing these areas as "urban filling zones", and that allowed already high urban density to be increased. This led to an uncontrolled urban substitution, while relying on illusory operations to reclaim services and public facilities areas. All this considered, regeneration shall become the standard intervention practice on the existing city and in particular on the historical peripheries, then the perspective shift shall include re-centering the project on common, public spaces and on the territory as a common good.

2.5 Conclusions, Looking at the Post-pandemic City

The pandemic experience revealed the urban system's fragility and showed its inadequacy in terms of changing living conditions of the inhabitants. This inadequacy was even more evident in areas that were already problematic, such as the historic city outskirts, because of their underlying conditions. Indeed, it is well-known that it is not density in itself, but rather its combination with degradation and marginalization factors, that was a factor in the spread of contagion (Balducci 2020). Moreover,

these suburbs constitute a significant part of the western city, often neglected by urban planning policies: since the planning activity carried-out by administrations of large cities is now mainly focused on addressing private operators' offers of intervention, which have naturally targeted the most valuable contexts, fragile areas were left in the shadows, deprived of any project ideas, other than the ones made by active citizenship groups with limited resources (Balducci 2020).

Given the epochal importance of the Pandemic event, in the field of urban design, researchers have engaged into a wide and deep reflection on several aspects, working mostly on three research domains: environment, mobility and public space (Gallitano et al. 2020). These topics are central in an overall rethinking of the post-pandemic city: firstly by focusing on the development of a new demand for health as well as environmental and landscape quality of urban space, and at the same time on the re-discovery of the rural environment as a place to inhabit; secondly by investigating new models of sustainable collective and individual mobility; and lastly, particularly relevant for this contribution, focusing on the role of public space as an anti-pandemic resource (De Luca 2020), reflecting on the dimension of proximity (Marchigiani 2021) or of "15 min city" (Moreno 2020), and aiming to make it more usable in flexible and temporary ways (Caruso and Pede 2020) also by recurring to the practices of Tactical Urbanism (Lydon and Garcia 2015).

The complex of theoretical research and practical applications sharply indicated in which direction we should move. In particular, in the case of the historical suburbs spaces, as attempted in the case study, the rethinking of such spaces was approached by "digging" into the density—and at the same time "filling" in the rarefaction of uses in contexts increasingly impoverished, in order to create new spatialities for new uses.

Furthermore, the criteria underlying the project experimentation were aimed to root actions to the contexts, restoring their history and at the same time bringing innovations in the form and use of spaces to respond to previous and emerging demands of the city.

The condition for successful interventions, especially in such complex environments, is to conceive urban regeneration in its integrated and multi-actor significances, while not neglecting the immaterial dimension of interventions. Also, it is necessary to renew the planning tools and refocus the attention on urban transformation, especially in such contexts that are not very attractive to the market if not in speculative terms.

For this reason, we intend to affirm that even in the post-pandemic city reconsideration, the key concepts of place-based approach and local development, referred to an inter-urban scale, represent the virtual coordinates which can be referred to in this renewal process, which is however only at the beginning.

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Chapter 3
The Concept of Proximity in Post-pandemic Architectural Thinking: 15-Minute City and Superblocks

Vasiliki Geropanta and Riccardo Porreca

Abstract The convergence of the climate crisis and the pandemic associated with the COVID-19 outbreak has exposed many weaknesses in the current fragile socio-economic and spatial structures of cities around the world. In this need to radically rethink the city, the principles of 'proximity' emerged in architectural discourse, promoting a notion of civic life within short distances to create sustainable, liveable and healthier urban spaces. In Europe, for example, '15-minute cities' and 'superblocks' seem to highlight important, if sometimes different, features of planning and policy efforts to economically restructure the city at the neighbourhood level and provide insights into the design of public space, in the post-pandemic period. Following on from the above, this paper will explore how these two new design models, through their structural elements and spatial characteristics, can help define proximity as a new strategy in design thinking in the post-pandemic city. To achieve this goal, the first part of the paper will provide an overview of proximity policies that have led to design adjustments in response to COVID-19. In the second part, a thorough overview is given of the two cases considered: the '15-minute cities' and 'the superblocks'. The third and final part of the paper summarises all the new design insights and the various lessons learned from the two cases in order to conceptualise a 'post-pandemic urbanism' and provide guidelines for the realisation of proximity principles.

Keywords Proximity · 15 Minute city · Superblocks · Post-pandemic urban planning

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3.1 Introduction

The ongoing pandemic has exposed many of the weaknesses of previous city models in addressing today's urban challenges and places future generations in an ambiguous situation (Batty 2020; Lennon 2021). While researchers have theorised and developed post-pandemic planning scenarios in the past (Eltarabily and Elgheznawy 2020; Helton 2020; LePan 2020; Nieuwenhuijsen 2016; Yu et al. 2004), the current reality requires a new perspective on how a city should function (Batty 2020). Given the new urban challenges and the multidimensional complexities that need to be addressed in order to find the best urban models for the future, we therefore wonder, in the words of Lennon, whether 'all our models will soon be overtaken by circumstances' (2021).

Many scholars today seek to define the post-pandemic city and contribute to the creation of design mechanisms that ensure quality of life beyond the challenges of the virus (Moreno et al. 2021). For example, smart city theorists (Liu and Chu 2010; Mahoney and Nardo 2016; Geropanta et al. 2021) claim that applied technologies could fundamentally help in the provision of proximity services. Furthermore, many scholars emphasise the potential and crucial role of urban street design in addressing critical situations, including social distance and related constraints (Eltarabily and Elgheznawy 2020; Pucci et al. 2021; Vecchio et al. 2020, 2021). Chiarotti et al. (2020) demonstrated the positive impact of urban walking and cycling policies during the strongest pandemic in 2020, and Barbarossa (2020) argued that this could be an opportunity to stimulate positive change in cities with a weak or absent culture of non-motorised urban environments. Honey-Rosés et al. (2020) confirmed the strong link between health and green and blue spaces, so a new post-pandemic city scenario must take this criterion into account, focusing on greening and microclimate control in urban clusters (Geropanta and Ampatzoglou 2022; Núñez-González et al. 2020). In particular, in the field of well-being and urban health, a number of researchers have highlighted many pioneering technologies that can achieve revolutionary results at the neighbourhood level and change our ideas about spatial planning (Thomas et al. 2022). As the early phase of the pandemic was characterised by severely restricted access to public spaces and buildings (Chen et al. 2020; Eltarabily and Elgheznawy 2020), scholars argue that the social significance and creative stimulation of public spaces (Low and Smart 2020) makes it imperative to rethink and design more flexible spaces to meet the new needs of the pandemic (Freeman and Eykelbosh 2020; Samuelsson et al. 2020).

What emerges as a common trend in many of the above examples is a focus on temporary interventions based on maximising the use of locally available resources, with proximity being the most important dimension (Kasraian et al. 2017). The literature shows that proximity is when 'the closeness to something is measured on a specific dimension' (Knoben et al. 2006, pp. 71–72). The geographical definition, also referred to as proximity, refers to a specific and measurable distance that should be planned and designed to move from car-dependent urban development to a pedestrian-friendly urban cluster (Cervero 2005; Gil Solá and Vilhelmson

2019; Handy et al. 2002). This reveals a planning paradigm that focuses on 'reduced travel distances, local living and the promotion of walking, cycling and public transport' (Gil Solá and Vilhelmson 2019, p. 1). The lockdown has severely limited urban mobility, revealing the crucial role of proximity in everyday urban life (Tricarico and De Vidovich 2021), as the role of neighbourhoods continues to improve, particularly as density, slow mobility and land use mix play a critical role in the provision of basic goods and services at the neighbourhood level (Curtis 2008; Gil Solá and Vilhelmson 2019; UN Habitat 2013; van Wee 2016). Finally, the post-pandemic framework proposes a new paradigm of urban living that focuses on improving accessibility to all services and needs, and promoting environmental and socio-economic sustainability (Gil Solá and Vilhelmson 2019). Paris and Barcelona seem to have adopted a very open attitude towards the creation of planning mechanisms that promote the radical thinking mentioned above by using proximity in the redesign of the city (Allam et al. 2021). Through a series of actions that are the result of a coherent rethinking of their urban artefacts (citation), both cities have proposed an alternative to urban planning. Paris promoted an idea for the city based on proximity services and the total reduction of the automobile (Hooftman et al. 2020), while Barcelona aimed at reusing public spaces and getting people to participate in the redesign (Bravo 2020). Both visions are based on pre-pandemic planning models (the 15-minute city and superblocks planning) (Rueda 2019) and seem to be at their peak right now. Therefore, they are both very relevant for understanding the link between the Covid outbreak and new spatial considerations for the post-pandemic city. Each of these new urban design concepts has important, if sometimes different, features in planning and policy efforts to achieve sustainable urban development that puts people at the centre: They reduce the health burden associated with current urban planning and transport practices, they reduce air pollution and noise, heat island effects and increase the amount of green space and physical activity. They also offer new planning approaches for the transformation of public space, including mobility plans, green networks, land use and housing.

In light of this development, the question remains unanswered as to how these current design ideas and best urban practises contribute to the new urban need for proximity in post-pandemic cities. To answer this question, this paper presents in the first part a series of actions that cities have taken in response to the pandemic for COVID-19 in this global emergency to highlight commonalities in global responses in terms of proximity. This will be followed by an overview of the two cases considered: the '15-minute cities' and 'the superblocks', the two most prominent cases using proximity-based reorganisation. In the end, all the findings and lessons will be brought together to conceptualise 'post-pandemic urbanism' from the point of view of proximity and to propose a set of planning tools that seem to be more resilient than others in the future city.

3.2 Methods

For this paper, we conducted a literature review on city transformations in relation to the pandemic COVID-19. This allowed us to understand the ephemeral changes that this global emergency has brought to cities around the world. In particular, we focused our review on the policies recorded in the OECD database, as well as on around 50 case studies around the world that have appeared in the last 2 years. After clarifying the new trends—policies in city organisation, we conducted a thorough analysis of the key documents on the case studies of the programme to find out the aspects of superblocks and 15-minute city that solve the pressure when confronted in a way that things can happen at the local level. The analysis of the two case studies looked at the key principles and reflected on their ability to track the emerging actions of the global response. Coming from two different disciplines: Urban Planning and New Technologies, we thought we could offer a richer reflection on this topic.

Although there is a very delicate and longstanding debate on the quality of housing typologies (which should be carefully addressed), which is about social equity (La Cecla 2008, 2015; Sabatini 1981; Sennett and Sendra 2020) and public health (Ghaffarianhoseini et al. 2018; Loftness et al. 2007; Ranson 2002; Zuhaib et al. 2018), this paper focuses on the urban level, in particular on land use and mobility criteria, as they can be analysed in depth from a proximity perspective, thus guaranteeing more coherent results.

3.3 Mapping Global City Response to the Pandemic Based on Proximity

During the pandemic, urban resilience for a higher quality of life was linked to a series of observations that promoted activities carried out a short distance from one's base. For example, land use planning was scrutinised as opposed to a fully mixed use environment, as many tissues were connected but no longer accessible (Moreno et al. 2021). The idea for relocating uses replaced the concept of 'what is allowed' here" with "what should be here" based on locally relevant transport needs. A summary of temporary urban services that emerged during the pandemic COVID-19, by Moreno et al. (2021), shows the temporary infrastructure changes that cities implemented against the Covid outbreak, from which we can take further ideas. For example, Berlin, Oakland, Philadelphia, Denver, Minneapolis, Vancouver and Chania implemented many bike lanes, while Dallas, Vienna and Rotterdam created new markets in response to traffic congestion and contagion (Moreno et al. 2021). In Table 3.1, we add to this research and show that while many cities adopted similar measures to control the Covid outbreak, they also implemented some temporary innovative proximity-based solutions as a form of urban response to this state of emergency. For example, the policy of lockdown led to a severe restriction of public transport in London (Barbarossa 2020) and similarly around the world (Rai et al.

2022), while in Italy, Latvia and Poland the work process was completely reorganised and people had to work far away from their workplace (Marino and Capone 2021; Marzano and Zając 2022). The same policies in Portugal, Ghent, Rotterdam and Montreal led to reforms concerning alternative methods of housing, such as the provision of AIRBNB houses for vulnerable groups or the relocation of workers whose homes were far from the city centre. Many services have been digitised and a range of delivery methods have been introduced in different cities. In Italy, the policy of limiting the concentration of people indoors led to a number of new outdoor restaurants, outdoor markets, temporary buildings outside pharmacies and clinics, and a number of efforts to digitise services that helped reduce congestion in hospitals and supermarkets and ensure that residents were able to access basic goods in their immediate vicinity. The policy of social distancing led to a number of small and large urban interventions, such as that of 'tactical urbanism' in the street space in Dublin. In Greece, the ability to authorise outdoor movement via SMS, introduced by the Greek government, created a platform for instant communication between the government and citizens and enabled radical citizen control. Similar infrastructures (ICT) in Ghent and Italy facilitate health and education activities. Another temporary infrastructure concerns the use of bicycle lanes, as established during COVID-19 in Italy, Berlin, Chania, Dublin, New York, Oakland, Philadelphia, Denver, Minneapolis, Vancouver, Bogotà and Seoul as an alternative to using public transport. Along the way, many other initiatives promoting alternative mobility options such as ridesharing, cycling and scooters have been set up in Edinburgh, Paris Rotterdam, Bogotà, Buenos Aires, Chicago.

3.4 15-Minute Cities, Superblocks and Emerging Variations in the Concept of Proximity

The 15-minute city is a planning model for the city in which most urban services and essential functions are within 15 minutes walking or cycling distance of residents' homes (Fig. 3.1). The 15-minute model was invented by Carlos Moreno (Moreno et al. 2021) to improve the quality of life of people living in densely populated areas where the number of cars on the roads is reduced and pollution is reduced. Today, the 15-minute model is on the rise and promotes a city made up of different landscapes and centres, all connected but internally independent. As a planning model, it promotes multi-centric urban development designed through a series of concentric circles emanating from the core of the city. Each of these inner circles marks a distance of 5, 10 and 15 min walk from this core, with land uses appropriately arranged, always in relation to the specific context.

Within a 5-min walk there are functions and facilities that meet the daily needs of residents, such as grocery shops, while within a 15-min walk there are weekly or monthly needs, such as hardware stores. Within 10 min there is usually a park, schools, clinics and other public facilities, with housing located between these places

Table 3.1 Relevant proximity-based urban action during pandemic COVID-19

COVID-19 policies	Urban changes in city functioning	Region	References
Lockdown	Limitation of public transports	London, Seattle	Barbarossa (2020), Rai et al. (2022) and OECD (2020)
	Smart working	Italy, Latvia, Poland	Merino et al. (2021) and Marzano and Zając (2022)
	Alternative housing provision	Ghent, Rotterdam, Montreal, Portugal	OECD (2020). https://www.bloomberg.com/graphics/2020-airbnb-short-let-reforms-lisbon/
	Food and pharmacy services delivery	Valmiera	OECD (2020)
Social distancing	Tactical Urbanism in street space	Dublin	Jasiński (2020)
Infrastructure (ICT)	Outreach campaigns	Greece	https://esngreece.gr/covid-19-faqs
	Heath digital app and platforms	Italy	Scrivano et al. (2022)
	Education	Gent	OECD (2020)
Limit of congestion indoors	Use of public space	Italy Ankara	Pereira Guimarães and Dessì (2021) and Erkılıç et al. (2022)
	Outdoor restaurants	Hoboken	Brandon (2020) and OECD (2020)
	Outdoor markets	Rotterdam	van Eck et al. (2020)
Non collective mobility	Bike lanes	Italy, Berlin, Chania, Dublin, New York, Oakland, Denver, Seoul, Minneapolis, Vancouver, Bogotà, Philadelphia	Barbarossa (2020), and Moreno et al. (2021). Covid_Mobility_Plan_22.5.20_FA_WEB.pdf
	Bicycle and walking zones	Edinburgh, París Rotterdam, Bogotà, Buenos Aires	Waller (2020) and OECD (2020)
	Education on alternative mobility	Chicago, Buenos Aires	OECD (2020)
	Electric-bicycle rent public service	Medellin	OECD (2020)
	E-scooter rental service	Middlesbrough, Rotterdam	OECD (2020)

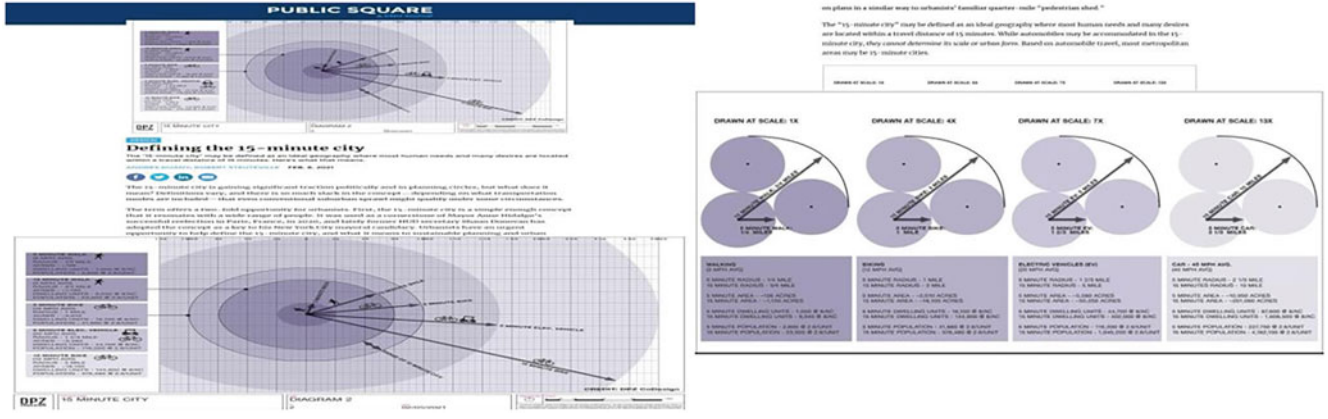

Fig. 3.1 Defining the 15 min city, Courtesy of Duany and Steuteville (2021)

and the core area. This proximity to basic services would help save time in transit, promoting sustainable mobility (Sisson 2020) and could lead to the idea of a city based on 15-min walkable neighbourhoods (Weng et al. 2019). From this perspective, land use improvements are often a key mobility benefit in this model. Similarly, a number of other important infrastructural changes are realised in this planning model: adoption of mixed-use housing models that promote compactness (Moreno et al. 2021), efficient use of resources like energy and water promoting ecological sustainability (Allam 2019), 'green and civic aspects in building and planning while at the same time enhancing the quality of life of the citizens including green spaces in the built environment, embracing use of green roofing and walls among others' (Moreno et al. 2021, p. 99).

In the case of Paris, the redesign of the city suggested six social functions included in each 15-min cluster, naming (a) living, (b) working, (c) commerce, (d) healthcare, (e) education and (f) entertainment and (Moreno et al. 2021) four structural planning priorities. The first one relates to ways of achieving proximity among all internal functions of the city. The second refers to the need for diversity, something that in Paris is promoted by applying mixed land uses to provide a wide variety of urban amenities nearby. The third is the urban density, meaning the necessary critical mass to support a variety of businesses in a compact area. The fourth and last is digitalisation, in ensuring the actualisation of the three other dimensions, a dimension that promotes a Human Centric Smart City model (UN-Habitat 2021).

All these neighbourhoods need to be so common that they are accessible to anyone who wants to live there.

Following this concept, the design requirements of this model consist of: (a) adaptable land use to meet the necessary life needs in each neighbourhood (living, working, providing, caring, learning, enjoying and finding fulfilment in life) (referring to both private and public space), (b) different housing types and affordability levels, with the convenience for everyone to live close to work. A third design requirement would be the application of flexibility in urban initiatives and social practises for appropriation in terms of ephemeral temporality—impetus for changing activities in public space at different times of the day. Abundant green spaces to ensure access for all to the natural environment and fresh, clean air. Cycling and walking networks are created, which also reduce the need for parking. Typically, smaller offices and spaces for retail, restaurants and co-working are created, allowing more people to work closer to home or in a virtual environment. Finally, each neighbourhood offers a unique set of conditions unique to that location. These include the relationship with neighbouring areas or buildings, the particular climatic situation and factors such as history and past activities.

On the other hand, superblocks is a concept for organising and designing the city based on dividing neighbourhoods into clusters. This system changes the street networks within 400×400 square metres to improve the availability of public space for leisure and community activities. The new layout is a low-cost and reversible redesign implemented in collaboration with residents.

Superblocks is seen by many (Graells-Garrido et al. 2021) as a description of Barcelona's 15-minute vision, and the 15-minute vision is often seen as the redesign

of a neighbourhood in clusters. However, superblocks are currently very much associated with the urban fabric of Barcelona, while the 15 min is largely seen as a planning paradigm to be applied in different urban landscapes (de Valderrama et al. 2020). What both cases have in common is that both urban models were conceived in 2016 but gained attention in 2020 as popular examples against the consequences of the Covid quarantine.

Barcelona's 15-minute vision includes a system that modifies road networks within 400 × 400 square metres to improve the availability and quality of public space for leisure and community activities, and to reduce air and noise pollution levels which are estimated to cause a large health burden (Mueller et al. 2017). Based on the fact that many neighbourhoods work on orthogonal grid patterns, but without this being a prerequisite for the implementation, the superblocks are 'cells inside the city, that pacify interior roads providing a local road network that is accessible primarily to active transport (i.e. walking and cycling) and secondarily to residential traffic with a maximum speed of 20 km/h' (Mueller et al. 2018). This new arrangement of the interior traffic reclaims public space for people, reduces motorised transport, brings more urban greening, reduces traffic and CO_2 emissions and mitigates the effects of climate change (Rueda 2019).

The superblocks create compact and connected neighbourhoods with mixed land use (Fig. 3.2). They promote the concept of pedestrianisation, a traffic policy of the 1960s to revive the inner city and to decrease air, noise and visual pollution (Kirova and Markopoulou 2021). From the various urban habitability design decisions, superblocks built around the notion of 'Ecological Urbanism', making the public spaces accessible to everyone, and promoting a way of life strictly connected with notions of sustainability and greening (Rueda et al. 2014). The new arrangement is a low-cost and reversible redesign, implemented in collaboration with residents.

3.5 Proximity in Post-pandemic Urban Planning Trends

In this section, we integrate the concept of proximity on the basis of our research components. As per the definition that now this concept is acquiring in the post-pandemic period the findings are the following:

- Urban proximity is defined as a short pedestrian and bicycle distance between two or more basic services and needs, such as supermarkets, green and public spaces, public-health points, etc. This distance could be perceived as walking time (15′) or as lineal range (400–800 m).
- In the areas that proximity is applied as a planning method, the result is that private car use is decreased while public and active transportation (walking and cycling) is increased creating new street identities, and leading subsequently to different city type development.
- The new planning method depends on step-by-step methodology to assess, design, operationalise and redefine public space, and public realm expression.

Fig. 3.2 Superblock and pedestrian spaces system in Barcelona. *Source* Archello (2019) and Bicycle Dutch (2017)

- Cars take up a lot of public space (road) network and parking that in all cases is given a new more inclusive identity, transferring life outdoors in areas where public realm could be divided inwards and outdoors equally.
- The Critical Success Factors (CSFs) that work with proximity in all cases seems to be the high rate of citizen inclusiveness and engagement, latent safety delivery and overall focus on well-being. Therefore, the theoretical outcomes can be defined through a new model that brings together New Urbanism, Public Participation, Inclusive Habitation
- Lessons learnt lead us to reflect on constraints related to Supportive Regulatory Framework, Territorial Divides and in some cases Digital Divide that are not fully yet addressed in the body of literature we examined.

Altogether, the landscape does not appear so fragmented when applying the concept of proximity in different places.

3.6 Conclusions

In this paper, we examined the various characteristics of the concept of proximity as it has been evolved the last 2 years through the various anti Covid policies and the planning models that best represent it.

More particularly, we identified and analysed 5 policies along with 16 changes they brought in the city addressing the above concept. Then we analysed the 15 model

city and the superblocks as two of the cases that work the best with these policies. The findings are of special interest to policy makers, to developers and other urban actors.

The overarching conclusion from this work is that proximity as a strategy to diminish the Covid outbreak is traversal both on the policy and on the urban planning level. There also emerged the role of technologies in implementing the proximity policies, creating a host of unexplored opportunities towards sustainable and healthier development. Working with these opportunities would require different and innovative ways of thinking and acting in urban planning. More particularly, we identified the following priorities that constitute the post-pandemic urbanism:

- The current crucial role of neighbourhood instead of metropolitan scale in designing and planning the city.
- Integrated technology driven applications that allow for alternative movement systems that are not vehicular dependent.
- Data-driven (GIS, Geocoding) decision making might allow for more inclusive and participatory processes creating thus a citizen—centric environment.
- The transformation of land uses is also a mobility intervention: mixed use and flexible land use systems in an area allow citizens to stay and solve daily needs locally and in short distances.
- Accessibility and proximity to public and green spaces is fundamental to prevent and manage pandemic crises, public-health risks and wellbeing.
- Smart working contributes to strongly limiting the unnecessary long movements in metropolitan areas, improving the quality of today's life, since the citizens gain time and health.
- Social distancing shows the crucial role of urban street design in providing safer and more inclusive public spaces, as well as the urgency to design a wider multimodal urban street system.

In order to visualise a post-pandemic urbanism based on these guidelines, specific actions are needed at the policy level that bring together the different elements. We can distinguish these actions in horizontal and vertical measures. For example, horizontally leaders need to make an effort in building an internal capacity to easily adapt to temporary changes like the ones that relate to proximity and based on the citizens' desires, to make these changes permanent. Permanent changes can rely on real time evidence to transform accurate and meaningful information into plans that help citizens. Furthermore policy measures can be taken on a vertical level. By looking at the changes that proximity brings in mobility, city leaders can provide resources that guide people through the differences that the new urban models are bringing.

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Chapter 4
Re-thinking Urban Open Space as a Tool for "Normality"

Rossella Franchino and Caterina Frettoloso

Abstract Each crisis opens new scenarios in which the concept of normality must be completely reviewed and redefined also in terms of resources and opportunities that can help design a future with a strong adaptive connotation. While the pandemic emergency has exposed our weaknesses on the one hand, on the other it has brought out our ability to react, to build positive dynamics starting from traumatic events. In other words, we had to adopt resilient approaches. Even in more strictly scientific terms, the pandemic has led us to adopt new schemes, to use new resources. It is precisely by sharing this approach, also experimented in recent research experiences, that the authors propose a series of considerations in which the urban open space is conceived as an articulated system able to provide not only an important reserve of space, compared to the more restricted living dimension, but also a tool to ensure a kind of "normality". The criticalities linked to social distancing represent, for the authors, an opportunity to experiment with differentiated modes of use, to imagine "*places in which to regain trust in others and re-establish a civic sense of belonging, for example through activities of "controlled" social aggregation, counteracting the loneliness of the new modes of living and working and guaranteeing a space of release from the spatial constraints of urban residences*" (LAND 2020). The idea is to define a model that works on a new quality and livability of urban open spaces, but especially on their relationship with neighbouring rural contexts, transforming each area into a spatial/functional element of an articulated network of open spaces that meets ecological-environmental, health and social needs.

Keywords Resilient approach · Health emergency · Open spaces network · Adaptive spaces

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4.1 Towards a New Normality

C. Frettoloso

Although the pandemic crisis has, especially in its initial phase, given people a great sense of insecurity and uncertainty, it has also brought out our ability to react, to build positive dynamics starting from traumatic events. In other words, the health emergency forced us to adopt resilient approaches.

Resilience requires a change in vision and above all in design codes. "*It is not just about the inherent ability of natural "things" to restore their equilibrium status after being disturbed: too easy! The challenge is bolder because resilience wants to remind us of at least two things. The first, that, like it or not, there are limits, more or less clear-cut, from which one cannot escape. The second is that there is someone who continues to disturb the balance of nature. And that someone is us, (…)*" (Mezzi and Pellizzaro 2016).

Boris Cyrulnik, psychiatrist, and psychoanalyst has repeatedly pointed out that being resilient means being able to transform a painful experience into learning, reorganising one's life and making this experience a formative opportunity (Cyrulnik and Malaguti 2005). Turning negative events into positive factors on which to build growth opportunities: resilience as a process to be built. Sharing the more recent concept of *transformational resilience*, "*resilience that is based on overcoming the temptation to return to 'before' and to restart based on quantitative growth alone*" (Caporale Pirni 2020), the need for a new concept of normality emerges, a highly dynamic normality in which it is the continuous adaptation that generates forms of balance between us and the world that surrounds and 'solicits' us. Within this resilient approach, as a process to be built, the theme of urban quality and living plays a key role in the definition of strategies for the adaptive transformation of anthropized contexts strongly oriented towards the components of collective and individual well-being.

To ensure the resilient behaviour of anthropized contexts in situations of anthropic and environmental criticality, it is necessary to work on the adaptive component of urban systems. According to this logic, adaptive urban reuse strategies, by allowing the creation of connective tissue through progressive, often punctual, and temporally diversified interventions, favour the improvement of housing quality. The public open space, as "*a potentially flexible management element of the city, about the uses and activities that take place in it and to the influences generated by the temporal and climatic factor*" (Boeri 2017), represents the concretisation of the quality of life of a specific context.

4.1.1 Interstitials Urban Spaces, Connection System and Enriched Boundaries: Urban Open Spaces Network Key Concepts

The role that urban open spaces have played during the different phases of the pandemic (Gehl 2020) has highlighted the need to strengthen and introduce "*wider recovery strategies, promoting the growth of urban quality, accessibility and usable permeability"* in which "*the redesign and differentiation of paths, the inclusion in networks and ecological corridors allow to insert these micro-spaces in an integrated environmental system in transformation*" (Boeri 2017). The model of urban open spaces to which we should strive pursues a strongly systemic approach in which the different existing and potential types of open spaces are organized as a network. To optimize the fruitive and environmental benefits of open spaces, it is strategic to work on connections so that they become not only transitional areas, perhaps including interstitial spaces, but true functional places for the city. Places where, by enhancing existing environmental qualities, the grey and green component (artificial/natural systems) is optimized and different regeneration and management strategies are experimented with, including through temporary and participatory projects. Sharing an anthropocentric vision of the project, each element of the urban open space network, whether nodes or connections, should guarantee conditions of psycho-physical well-being and, in general, liveability for those who use them (Pregill 2020).

If open spaces are the system on which the city must focus to respond to the needs of resilience, what scenarios can develop in a health emergency such as the one we are experiencing?

Probably from a methodological-planning point of view, starting from the lived experiences of social distancing, the answer is to be found in the search for new interpretative criteria of open spaces. Criteria oriented not only to the definition of dimensional aspects and aimed at creating conditions of safety and "separation", but rather to the adaptive component, in terms of fruition and comfort, of urban systems. Accessibility, permeability (physical-perceptual), and connectivity (technological and ecological-environmental) can become, in this logic, keywords on which to build the open space system as a resilient urban infrastructure. This concept of the network (Franchino and Frettoloso 2017), with its different model declinations depending on the performances to be optimized, attempts to respond to the need's framework linked to the still current pandemic crisis, reinforcing, on the one hand, the concept of connection and introducing, on the other, two important focuses relating both to the need to intercept residual spaces and to interpret the concept of margin innovatively.

"The forced confinement, obliging people to live close to their homes, led to the recognition of many 'interstitials' public spaces, different and heterogeneous in nature, which represented and, in many cases, allowed them to experience niches of freedom and contained sociality. It was these 'common territories' that guaranteed two aspects of performance during the most acute phase of the pandemic: the fact that they could be used in many cases as alternative routes to the traditional ones to

avoid overcrowded transits, but above all they were able to take on the role of places to relax and offer the maintenance of relational forms between neighbours, while respecting the necessary physical security" (Gori 2020). Being able to intercept, integrate and enhance these common spaces within the urban open space system is not only highly desirable but essential to the creation of a network that can provide "space reserves" but, above all, to infiltrate the often very dense urban fabric.

However, creating a system mainly means building connections, i.e., identifying both rules that clarify the interaction between several functional areas and which type of connection can guarantee a safe, non-impacting and comfortable movement also to define the relation, in terms of physical and perceptive permeability (Pregill 2020).

It will be important, therefore, to work on the possibility of contracting and expanding the collective space through, for example, flexible margins reinterpreted also as technological green systems, i.e., systems that not only have the function of improving the micro-climatic performance of a specific context but also act as a link with other natural systems/areas to ensure the conservation of habitats and to mitigate in structural, functional and landscape terms any impacts resulting from the presence of disturbance factors. This need for more dynamic urban open spaces suggests a reflection on the concept of margin, of boundary, which is an element of suture and, therefore, somehow penetrable (Lynch 1964) and definitively abandons the appearance of a line to become a system "enriched" and characterized by its "thickness". In this scenario, the margins will also be able to accommodate "active" and "productive" elements that provide for controllable and possibly time-diversified modes of interaction, thus also contributing to reducing the impacts of human activities. In conclusion, the health emergency is reinforcing the need for "reconnection" both with nature, a need strongly shared also by Agenda 2030, and with the other. In this sense then, the open space can provide significant answers not so much to establish a "social safety distance" but rather "*a space to build new social contracts for the future*" (Molinari 2020).

4.2 Urban Open Spaces Features

R. Franchino

The Covid-19 pandemic has predominantly highlighted the strategic role of public open space. Even during the first pandemic wave "*In Italy, the second country after China which was interested by the Covid-19 pandemic lockdown, the reopening of all public spaces happened after 2 months of closure. This allowed again "in presence" social interactions, although in respect of the physical distance, confirming the importance of these places for all people"* (Sepe 2021).

The pandemic situation has confirmed the need to equip urban areas with open spaces, but it is necessary to ask questions about their structuring and configuration.

> There is great uncertainty about how COVID-19 will impact future public space design, use and perceptions. How will our relationship with public space change? How long will the changes endure? […] Is the attention devoted to COVID-19 distracting us from the existential challenges of sustainability and climate change? Or, optimistically, will this global experience lead us to rethink the way we develop and (re)design our cities? (Honey-Rosés et al. 2020).

This health need has highlighted even more the importance of urban open space in urbanized areas, in addition to the already known social and ecological-environmental needs. While the need to provide urban areas with open spaces is becoming more and more evident, it must be taken into account that the massive anthropization that has characterized the last century and the beginning of the current one has unfortunately led to the presence of open spaces in urban areas being increasingly scarce.

Those currently present, moreover, are often in a state of degradation and in many cases even abandoned.

A first step, therefore, could be to redevelop existing urban open spaces in order to improve their quality and liveability and at the same time configure them as connection systems between the urbanized area and the surrounding natural one. In the context of the transformation of anthropized contexts, the reconversion of urban open spaces takes on a strategic role, especially if the reconversion takes the form of a renaturation in which processes that use the principles of nature take on a predominant role.

This assumes fundamental importance especially because currently many urbanized contexts are in conditions of environmental emergency about resources: water, air and soil. In this regard, in-depth studies are proposed relating to solutions that operate with environmental resources and that use the principles of nature which stimulate the natural potential of these resources. This approach can allow us to improve the carrying capacity of the territory to control urbanization phenomena with a sustainable impact on the ecosystem.

In this regard, it is necessary to conceive the territory as a dynamic system that allows the technological management of complex functions and, therefore, as a fabric that can control processes in such a way as not to reveal the boundary between the artificial and natural environments.

Anthropic activity with all the actions related to them produces a notable trace of the environment as a sign for future generations. It is therefore of fundamental importance to implement actions that limit this footprint. To orient the recovery interventions of areas compromised by previous anthropic activities according to this logic, it is necessary to operate in such a way as to increase the carrying capacity to absorb the anthropization phenomena with a sustainable impact on the ecosystem.

Thinking about the rebalancing of urban contexts, a key role is played by the environmental redevelopment of open spaces as their transformation is capable of activating particularly effective revitalization processes, especially if they occur in the presence of unfavourable ecological-environmental conditions.

4.2.1 The Case Study of Lago Patria in the Campania Region (Italy)

Based on the above considerations, the objectives underlying the redevelopment of urban open spaces must necessarily be to qualify life, protect health, enhance safety, and facilitate the relationships between the inhabitants. To approach the planning of activities for the environmental rebalancing of urbanized territories requires carefully identifying the possible interference between the natural and anthropogenic aspects with the issues related to the sustainability of urbanization, conservation of biodiversity, the controlling of the use of the land and territorial fragmentation (Franchino and Frettoloso 2017). The redevelopment interventions of the territory have to move with particular interest, among other aspects, towards the ecological conservation of biodiversity (Elmqvist et al. 2013) in order to safeguard the natural processes that form the basis of the survival of ecosystems. To arrive at an applicative definition of the concepts previously discussed, is presented below a redevelopment design proposal of three adjacent urban open spaces in Lago Patria in the Campania region (Italy) which, due to its highly urbanized features, presents itself as an interesting application case (Figs. 4.1 and 4.2). The results of the initial climate-environmental analysis relating to the urban open spaces studied allowed a preliminary understanding of the environmental issues of these areas. This has enabled the following to be calibrated appropriately the technological recovery interventions that improve the relations between the site and the environment with maximum sustainability capacity. The transformation intervention was conceived in relation to the control of the ecological environmental conditions of the open space, which are heavily compromised. For each of these urban areas, the application of appropriate and innovative systems nature based have been hypothesized that transform the areas, often characterized by degradation and degeneration, into completely renewed contexts.

4.3 Conclusion

This paper studied the redevelopment of the urban open spaces that assume a strategic role for the transformation of the anthropized contexts. All this only if the reconversion is an actual re-naturalization, with it activating the processes that use the principles of nature as a sustainable management model.

In particular we propose some considerations about the reconfiguration of urban open spaces so that they can respond not only to social and environmental needs but also to health needs following the Covid-19 pandemic. In this regard the urban open space is conceived as an articulated system able to provide not only an important reserve of space, compared to the more restricted living dimension, but also a tool to ensure a kind of “normality”.

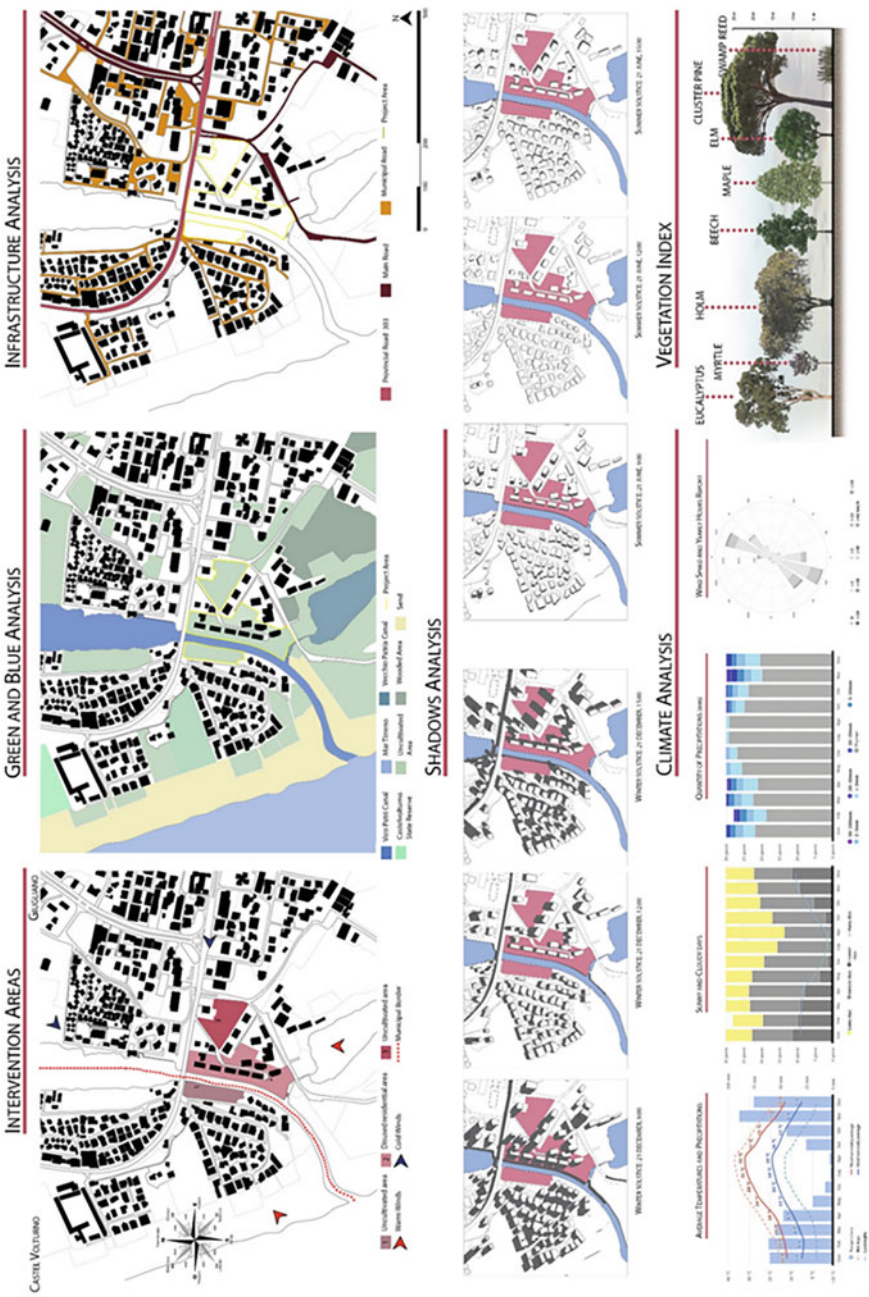

Fig. 4.1 Urban open spaces redevelopment_initial analysis (courtesy of P. Orsi, S. Soprano, A. Verde)

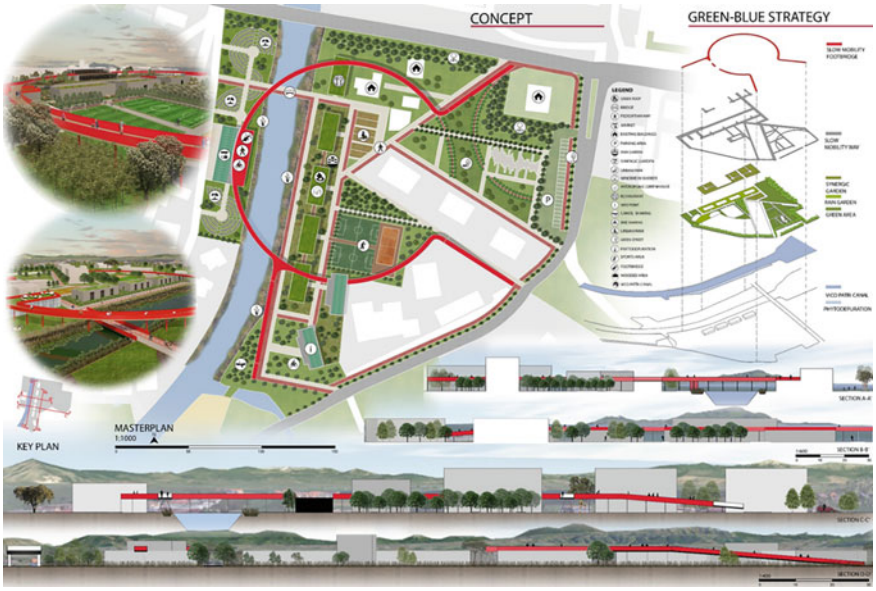

Fig. 4.2 Urban open spaces redevelopment_concept (courtesy of P. Orsi, S. Soprano, A. Verde)

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Chapter 5
The Contemporary Coast as an Urban Amphibious. The Complex Relationship Between City–Sea Interface and Urban Coastal Society After the COVID-19 Crisis

Ivan Pistone

Abstract The contribution aims to explore the concept of *urban coastal society*, a community intimately connected to the coast and to the sea, in the context of the socio-spatial and climatic-environmental critical issues that characterize the development of large coastal cities during the past pandemic situation. In spatial and functional terms, the urban shore could be considered as an *urban amphibious*, that is, the urban area where the land and the sea physically meet, in relationship with the ability of the city and the coastal community to constantly adapt to these two systems. It is an aggregator of *coastal commons*, shared resources whose importance is fundamental for the adaptation of the coastal society to external impacts. Anyway, its integrity appears to be fragmented since it is composed of variegated elements (port areas, production plants, urban beaches, insecure or abandoned spaces) that can also be considered as pieces of a potential green–blue infrastructure. In this sense, the concept of city–*sea interface* can be mobilized, as the physical, ecological, social and functional contact area between the edge of the city and the edge of the water: it can be considered as an expression of the urban amphibious, a space in which different ways of experiencing the coastal life of the city are juxtaposed, with a strong need for flexible management. These premises require us to investigate how to plan and manage 'blue spaces', considering them as potential quality public areas along the urban shore: during the Covid-19 pandemic, this necessity becomes even more absolute in relation to the evolution of social needs that require a greater amount of public space to guarantee to each user valuable social spaces while preventing contagion. Coastal areas therefore take on an even greater social and therapeutic value in large coastal cities.

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Keywords Urban amphibious · Urban coastal society · City–sea interface · Socio-recreational uses · Ecological planning · Health planning · Coastal social needs · Coastal commons

5.1 Introduction: The Contemporary Urban Coast

The research aims to analyse the link between urban coastal society and the city–sea interface that hosts it: in this sense, the urban coast assumes the role of an urban amphibious, due to its adaptability to external impacts and changes, especially in a complex situations faced by communities, like the Covid-19 pandemic. The objective is to explore how urban planning can intervene on coastal public spaces (existing or potential) of the city–sea interface, in order to resew its fragmented structure, in social and recreational perspective, allowing users to access to the urban sea equally and directly and increasing the quality of life in large coastal cities. In fact, although the study of urban coastal areas is a well-known research topic, especially in terms of sustainability, urban regeneration, abandoned industrial areas, port and rear-port areas, urban shores are also characterized by a very high landscape value, coherent with an intrinsic socio-recreational value that can still inspire different uses (Green 2010).

Over the last century, coastal transformation has mainly concerned the modelling of urban waterfronts, the enhancement of logistical and economic requirements, and the recovery of the coastal aesthetic value. However, the current condition of the urban shores brings out the need to focus more on the issue of coastal social needs (Porfyriou and Sepe 2017). In fact, it is true that the community evolves in relation to coastal changes. Urban coastal society is deeply connected with wide-ranging topics, such as environmental and ecological risks; to these are added the critical issues related to land consumption, a very rare but necessary resource to ensure equal fruition of public places for recreation and socialization along urban coasts; an inevitable consequence is a growing spatial and environmental injustice inversely proportional to the community need for quality coastal public spaces, also in relation to the need for social distancing during health emergencies (Mega 2016).

It is therefore essential to face the issue of social needs in relation to proximity public spaces along urban coasts. At the same time, the research is confronted with the problem of services provided by urban shores to the physical and psychological health of citizens and the cultural offer; environmental risks are linked to these aspects, as phenomena such as coastal erosion, floods, sea-level rise affect the way of living the contemporary urban shore. These problems are clearly comprehended within the macro-category of land use and landscape management, and by extension within urban planning.

The proposed methodology is based on a study of the main theories linked to urban coastal areas, in order to investigate the relationship between recreational uses of coastal interface and the contemporary social demand. This analysis tries

to elaborate a theoretical framework for a geographic-spatial study related to the physical and functional characteristics of the public space of the city–sea interface.

5.2 The Coastal Society and the Relation with the Urban Amphibious

It is possible to define the *urban coastal society* as a community intimately connected to the coast, as the urban area of first interaction between settlements and the sea, and to the coastal water, essential in the ecological transition process and fluidly linked to the urban system whose shores are shaped by the uses of the community (Osbaldiston 2018). Urban coasts, especially those of larger cities, provide a wide range of 'urban services': housing functions, benefits to health, socio-cultural and job opportunities, transportation, alongside the numerous ecosystem services produced in these complex cities, such as good water quality and the regulation of microclimates. Nevertheless, the contemporary city, and in particular its coastal areas, turns out to be a source of stress and social anxieties, due to the frenetic rhythms to which the urban ecosystem undergoes and transforms: therefore, the socio-recreational value of urban coasts is essential for the urban coastal society, influencing liveability, cultural environment and appearance of coastal cities.

The ever-changing nature of urban shores reflects the diversified needs and experiences of the community, requiring a high degree of socio-spatial flexibility. The evolution of the coastal identity is connected to both time and space dimensions, influencing the enormous coastal symbolic power and making a unique classification of urban coastal society very hard to establish (Gillis 2012). From a spatial point of view, the coasts are rarely configured in a straight line: this fact influences the social relationship with the sea and the organization of the cities, as the community, and consequently the urban agglomeration, tend to be enclosed in compact structures that inspire a feeling of protection from the maritime vastness and the direct and constant contact with the open sea. In this perspective, it is meaningful to deepen the notion of *urban amphibious*: this concept indicates the urban area of contact rather than the separation line between the land and the sea, recalling the ability of the city and its community to constantly readapt to these two systems, both in spatial and functional terms, highlighting how the urban coastal society is confronted with the benefits (but also the critical issues) that are linked to the coastal development (Worthington 2017). It is interesting to investigate the connection between the evolution of the coastal city and the functional opportunities that the coast offers, as well as its physical factors influencing the coastal community. Within the aforementioned urban amphibious, it is possible to identify different types of coastal-urban forms, or configurations that the coast of maritime cities assumes in relation to the morphology of the place, the environmental characteristics of the marine space and how society articulates its actions on the sea, for the sea and from the sea (Land 2016). The urban amphibious attracts investors who aim to invest on the urban shores, due to their touristic appeal

and landscape amenities. However, from an ecological point of view, it is impossible to ignore problems like coastal erosion and sea-level rise, as well as flooding.

Furthermore, a solution involving the strategic retreat of coastal communities is not practically and sociologically feasible, as the extent of the aforementioned critical issues is difficult to imagine, the available space is very scarce and the identity values of coastal society are not replicable. At the same time, the current pandemic situation amplifies the social need for public space: for this reason, the urban coast seems to be the ideal place to meet these community necessities both from an aesthetic and landscape point of view and from the point of view of the health of citizens, considering the therapeutic value that maritime areas possess. In fact, shores are the main, if not the only, areas of contact between coastal society and nature in mostly urbanized zones of contemporary cities (Gascon et al. 2017).

It is therefore legitimate to ask ourselves how to approach these urban transformations in a technical and sociological way to favour a less uncertain future development for coastal society, considering that cities are not infinitely available to change. In any case, it is possible to say that contemporary cities are still searching for a design and governance model that allows them to efficiently deal with the critical issues related to the development of their own shores, in terms of social challenges but also environmental risks. (Acierno et al. 2021; Arcidiacono and Ronchi 2021). In response to this lack, the urban amphibious support cities along the shore with *coastal commons*, shared environmental resources on which the city depends and whose importance is a priority for the development of coastal communities (Berkes 2015). The coastal commons must be framed in a socio-ecological perspective in which the human system, including socio-economic well-being, and the biophysical system are in a relationship of cultural, environmental and normative reciprocity. The communities therefore have a fundamental role in terms of governance, in relation to their expectation for coastal development but also to the equal fruition of resources. Coastal commons appear to be connected to a triple dimension: the geographical dimension is linked to the use of resources; the time dimension deals with management and planning development; the socio-political dimension is connected to the functional organization of the coast and stakeholders. The coastal society and the urban coast have an adaptive capacity to face external socio-ecological impacts, such as climate change or socio-spatial issues: if these changes are manageable, the structure of the urban community will adapt without changing its identity characters; otherwise, there will be a transformative response with positive or negative outcomes, in relation to the speed of changes and the quality of the interventions (Armitage et al. 2017). This concept is linked to the notion of urban ecosystem services that the coastal society benefits from, representing a sustainable key to the issues of social coastal uses.

5.3 The City–Sea Interface: Social Value of the Urban Amphibious

The urban amphibious does not only refer to land areas. This peculiar urban entity can be included in the macro-category of geographical 'interfaces': it is in fact an area in which two interrelated subsystems (the city and the sea) influence each other in a reciprocal manner, constantly redefining the coastal area (Acierno et al. 2021; Pittman and Armitage 2015). The phenomenon of coastal urbanization can fit in because it can be observed both on land and on the sea. From a geographical and functional point of view, the urban coast is therefore configured as the peculiar habitat of the coastal society. Each user then becomes stakeholder for economic but also residential, social and recreational needs, shaping the coastal ecosystem, exposing precise expectations about its transformation, and attributing particular perceptive characteristics to it (Turri 2002). The complexity of the coastal interface also depends on the variegated fragments that compose it, which can be classified into a range of juxtaposed spaces: the most urbanized ones are less prone to urban transformation, such as port or industrial areas and dense city zones; the less anthropized ones are more flexible from an operational and urban design point of view, such as natural spaces like urban beaches, green–blue parks along the coasts, poorly equipped open spaces, but also abandoned areas or public places perceived as unsafe by the population. The elements of the latter category, in particular, can be read as an opportunity for sustainable social development, as potential components of a multifunctional green–blue infrastructure. It is very important to consider these specific instances for reorganizing the spaces of the urban amphibious for the coastal society, rethinking their functions and facilitating their management and use, according with the current social and recreational needs. These necessities involve a smaller attention to large public spaces dedicated to tourism and visitors, emphasizing instead the importance of proximity and quality public spaces that allow citizens to live and come into direct contact with the sea and the coasts of their city (Pittaluga 2018). This is particularly important in this moment of pandemic which highlights the relevance of wider public spaces and personal distancing.

Coastal urbanization is considerably relevant due to its direct relationship with the sea, in a spatial, time, visual and functional sense. In this perspective, the concept of *city–sea interface* can be introduced. It represents the coastal space within the city where the urban ecosystem and the marine ecosystem come into direct physical contact, amplifying littoral social, ecological, and functional relationships (Acierno et al. 2021). This interface extends along highly urbanized land areas and along heavily used marine spaces, constituting a significant spatial and functional continuity (Robert 2019). At the basis of the theory, there is the hypothesis that the portion of the city closest to the coastal water is the most affected by the maritime element in the urban environment: the two systems are therefore intimately connected, constituting a unitary spatial, social and ecological entity. Its structure is not fixed, but it is articulated over time, according to the social and environmental changes that

the urban coast undergoes; moreover, it is characterized by relatively small spatial dimensions, on both land and water sides of the coast.

From a dimensional point of view, the city–sea interface can be schematized in three strips of variable width, as shown in Fig. 5.1. The *sea edge* indicates the area of water closest to the shore; its extension is linked to the geomorphological structure of the coast and to the depth of the seabed: in fact, for socio-recreational uses, it is mandatory to consider the limits imposed by bathing safety or technical characteristics of floating installations (such as platforms or similar), as well as local regulations, directives and administrative boundaries. The *maritime city edge* is between the sea and the first transit road parallel to the coast: it is the coastal land strip closest to the water system and, for this reason, particularly important from an environmental and ecological quality point of view; its extension is determined by the effective distance that runs between the sea limit and the road, so it is possible to observe a very wide area as well as a reduced zone that may even disappear in some cases, in relation to the shore morphology; it is interesting for the potential presence of public or semi-public open spaces in very close relationship with the sea, even if also the built environment can have a crucial importance, due to its spatial and visual correlation with the urban water. Finally, the *extended city edge* is considered the most extreme part of the city–sea interface: it has a fluctuant geometry and a variable dimension and depends on the presence of significant green areas or open spaces connected to the coast, with low value of population density.

The city–sea interface can therefore be considered as an expression of the urban amphibious: it is in fact a space in which different ways of experiencing the coastal life of the city are juxtaposed, from a recreational, commercial, economic point of view. In the same way, the flexibility of this area recalls the concept of the amphibious, dealing with the environmental evolution of coastal urbanized area. However, it is relevant to consider the proper management and localization of human activities, not only in space, but also during time. This is due to the progressive disintegration of the margins between the various spaces along the shore, in the land and in the maritime context. The coastal character appears discontinuous, which is why a reticular approach should be offered, considering economic-productive, environmental and cultural aspects, influenced by the gradual dissolution of the traditional boundaries of urban coasts, and by the effects of social inequality. This is particularly meaningful in relation to how the new post-Covid coastal community experiences sociality in everyday life, absorbing the social impact and adapting to evolving uses of coastal public places and to the ecosystem resources the they can provide: it is therefore important for urban planners to analyse in detail the spatial composition of the city–sea interface with particular attention to places of sociality to be recomposed as a new infrastructure at the service of coastal society.

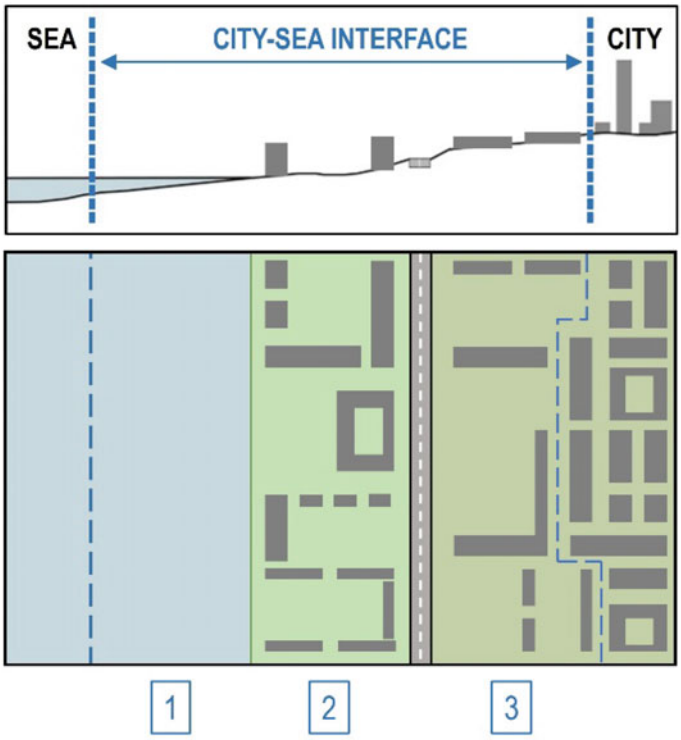

Fig. 5.1 Width of the city–sea interface. Part 1 is the sea edge, part 2 is the maritime city edge, part 3 is the extended city edge (*source* author)

5.4 Geographic-Spatial Analysis. Reinterpreting the City–Sea Interface

The city-sea interface is the result of complex interactions between natural processes and human activities. Urban growth and natural risks related to the maritime environment create new challenges for coastal management. Quantifying and visualizing short-term evolution can be useful to study the city–sea interface, in relation to environmental and anthropogenic impacts; identifying neuralgic areas susceptible to risks but suitable for sustainable transformation and mapping socio-ecological vulnerabilities are fundamental steps for responsible planning and management of urban coasts (Hardin et al. 2014). The complexity of these spaces can be reinterpreted through the analysis of the structure of the city–sea interface and its spatial and functional organization. The digital transposition of the urban amphibious can in fact help to better understand the usability of the public areas for the coastal society, but also what are the physical-functional constraints that prevent efficient and equal spatial functionality. The geographic-spatial analysis is therefore a useful approach to investigate the

issue of accessibility to the public space of the coast, in relation to its social, environmental and geophysical aspects. The pandemic situation has in fact shown that human settlements often lack adequate spaces for recreation; the apartments are now too tight after the lockdown period, so it is essential to consider the socio-ecological value of the urban amphibious: this parameter is difficult to quantify, so it is difficult to implement it in modern coastal cities (Kleilein and Meyer 2021).

For these reasons, a *spatial data model* is proposed. It is a tool that allows to geolocate spatial information and geographical phenomenon or function in the coastal space. It is useful to represent spatial components in the form of geometric objects with precise features (Neteler and Mitasova 2004). It is indeed appropriate to ask ourselves how to manage the complex urban amphibious, without fully understanding its physical and functional composition. Its efficiency depends on various factors: physical, natural and socio-economic variables interact with each other at different scales and in different times, requiring a multidisciplinary approach. Urban coastal environment appears to be sensitive to the interests of coastal users who are often in conflict and could be better managed thanks to a geographic-spatial study (Gourmelon 2003).

From a methodological point of view, it is necessary to define the scope of the spatial research. For this reason, the first step is to select some research criteria to prevent the research from being too wide but also to establish priorities in data collection. In this ways, it is possible to define a hierarchical information structure: each layer is fundamental to understand an aspect of the city–sea interface. Space–time aspects are therefore combined with various attributes in order to decode the coastal territory in a semantical way, elaborating an understandable and coherent framework, suitable for in-depth research (Tambassi 2019).

The main objective of the proposed approach for a spatial data model dedicated to the urban amphibious is the analysis of the social and ecological elements of the city–sea interface in order to highlight the socio-recreational potential of these places. It is relevant to study which social uses directly linked to the sea are practiced along the urban coast, as well as the effective supply of coastal ecosystem services, particularly linked to the psychophysical well-being of citizens and the use of coastal cultural and natural amenities; this is connected to the analysis of the current morphological structure of urban coasts as well as the formulation of reasoned hypotheses regarding its possible future evolution. As shown in Fig. 5.2, the hypothesized structure can be articulated according to groups of layers schematized in the following way (Gourmelon and Robin 2005). *Base maps* will include aerial photographs, topographic maps, three-dimensional models and georeferenced maps. *Geophysical and natural system* will collect data related to the physical structure of the coast, including beaches, natural areas, cliffs, as well as the quality of the water, but also piers or other structures that modify the coastal profile. *Anthropic system* incorporates the built environment (buildings classified by height, period and type, productive plants, services like hotels or sports facilities, public spaces, abandoned areas, historical and cultural heritage) and mobility infrastructures, both light and heavy. *Uses of the urban coast* refers to the different functions that can be developed in the various coastal areas, together with information about the *spots of specific*

recreational practices, which identify social and recreational activities related to the urban sea; furthermore, *accessibility and visibility* group is considerably interesting, because of the analysis of direct accessibility to public spaces on the coast (free access, access with a ticket, private access, physically or legally denied access) as well as indirect accessibility and visibility constraints. In the *administrative elements* group, the administrative limits on a municipal and sub-municipal scale, as well as the protected areas or the existing urban plans along the city–sea interface, are gathered. Finally, *health and demographic data* analyse the sociological composition of the urban coastal society, in relation with pandemic indicators, like the percentage of infected and vaccinated people, the presence of outbreaks but also environmental pollution that seems to influence new infections (Bianchi and Cibella 2020): this is particularly relevant for coastal areas because the proximity to the sea mitigates respiratory diseases, strengthening the socio-recreational and therapeutic value of the city–sea interface for users (Charlier and Chaineux 2009). This framework is flexible, offering the possibility of being implemented or adapted according to the aims, strongly focusing on the sociality along urban coasts.

0. Base maps
Aerial photographs - 1970 - 1980s / 1990s - 2000s / 2010s - 2020s
Topographic maps
Georeferenced maps (for coastlines, built and natural environment and functions) - 1970 - 1980s / 1990s - 2000s / 2010s - 2020s
High resolution 3D model

1. Geophysical/ natural system
Coastline: - 1970 - 1980s / 1990s - 2000s / 2010s - 2020s
Terrain/ relief/ topography
Water depth
Dykes
Jetties
Rocks
River mouths
Beaches
Water quality
Relevant vegetated areas
Public green areas

2. Anthropic system
Built environment
Buildings (by type, height, period)
Productive plants
Public services (es. hotels, sport facilities)
Open public spaces (e.g. squares)
Abandoned industrial sites
Historical monuments/ elements
Underwater heritage
Mobility infrastructure
Light mobility - Pedestrian path - Cycle lanes - Electric tramway
Heavy mobility - Road system - Railway/ train infrastructure

3. Uses of the urban coast
Socio-recreational coastal areas
Water leisure areas
Commercial areas
Residential areas
Industrial areas
Port areas (Commercial/ leisure)
4. Spots of specific recreational practices
Fishing spots
Bathing spots
Nautical associations
Cala/ Public access to the sea for boats
Cultural activities (subaquatic museum…)
Running/ cycling areas

5. Accesibility/ visibility
Accessibility analysis (direct access)
Free access to public space
Access conditioned by tickets/ services
Private access
Physically impossible access
Legally impossible access
Visibility analysis (indirect access)
Constraints to viewing the water/sea - Plain fence/ wall - Trees - Building - Boats racks/ Storage

6. Administrative elements
Neighbourhoods
Census sections
Municipality limits
Port admnistrative limits
Municipal sea water limits
Plan of land properties
Plan for beaches/ coastline management
Municipal urban plan/ Land planning docs.
Natural/ Protected areas
7. Health and demographic data
Total resident population
Population for gender
Population for age (each 5 years)
Distance of the house from the sea
Pandemic indicartors
Percentage of infected people
Percentage of vaccinated people
Covid-19 outbreaks
Environmental pollution

Fig. 5.2 Proposed criteria to build a spatial data model for the city–sea interface (source: author)

5.5 Conclusions

The contribution is related to studies conducted by the author during his doctoral research, in relation to the specific criticalities of large coastal cities. The theme of urban coastal society, its sociological composition and its relationship with the resources offered by the urban amphibious could be seen as a key for interpreting the issue of coastal public space. This is coherent with the definition of city–sea interface, as described in this research, and appears particularly important in relation to the development of the coastal community, characterized by contrasting social needs and by the necessity of the right amount of space to avoid contagion. A geographic-spatial analysis is then suitable for decoding the socio-recreational potential of the urban amphibious.

This approach tries to gather physical-functional data and could provide a methodological basis for social analysis on the field. The aim is to define indicators to reinterpret the relationship between urban coastal society and spaces for sociality and recreation along the urban shore. In this sense, the research is trying to understand how the coast is used and by which urban users in order to reorganize the governance of the urban amphibious and make it more efficient. This could result in less conflicts of interest in the urban coastal society and in more equal accessibility to the sea resource of the city. The theme of the use of coastal public space, especially from a socio-recreational perspective, is therefore connected to the understanding of the tools for designing the city–sea interface at a local scale: these urban planning approaches should certainly be readapted in relation to the pandemic condition that cities and their coasts are living. Research perspectives aim to further deepen the social planning of the coast, as an important theoretical but also methodological output for the urban coastal society.

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Chapter 6
European Coastal Areas and Opportunities for Sustainable Transformations in Post-Covid Society

Antonio Acierno

Abstract Currently, the development of coastal urban planning and landscape design must confront the existing contrasts between the urban areas along the shore (including ports, industrial areas, residential areas) and the natural spaces of cities. European coastal landscapes, relating to the sea but also to rivers and lakes, are very often characterised by various functions and suffer from strong friction between the uses that citizens would like to develop along the coasts and logistical and commercial needs. At the same time, tourism is increasingly affirming itself as a fundamental economic pillar that inevitably influences the dynamics of development and evolutionary patterns of urban shores. However, the Covid-19 pandemic has altered social, economic, cultural and productive relationships and connections. In post-Covid society, the need for open spaces is higher than before, especially along the coast in order to access the sea as a natural place of great importance. Added to this is the greater demand for proximity open spaces by the post-Covid society, so that residential areas are directly connected with healthy places on the coasts, well known for the benefits to human health. The value of water recreational activities is in fact measured through the various positive effects on citizens' well-being, in relation to physical exercise and mental well-being, which is one of the main reasons for pursuing the widest possible access to the sea. This paper aims to explore the value of ecological planning for national and international coasts, trying to analyse whether contemporary cities are effectively managed and designed to meet the economic and socio-recreational expectations of the users. The awareness of the effects of health-related environmental and socio-economic challenges, exacerbated by the current climate, economic and pandemic crisis, is a fundamental key to rethink urban planning approaches to improve the quality of life in our coastal cities.

Keywords Coastal cities · Open spaces · Healthy planning · Green blue infrastructure · Nature-based solutions · Ecosystem services

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6.1 Introduction: Coastal Areas as Space of Opportunities

The European coastal areas are characterised by various morphologies with the presence of hills, cliffs, rocks, beaches and ports, the latter very often situated in the middle of a high densely urbanised areas.

The urban and landscape planning have to necessarily consider the relations and possible conflicts between urbanised areas, such as ports, industrial and residential areas and natural ones. Coastal landscapes, including the river coasts, across Europe are often characterised by competing land uses where settlements and infrastructure, especially road and train networks, are located. Conversely, the tourism industry is also a major driving force with its own development dynamics and typical spatial patterns.

In the post-covid society the demand for open spaces is growing, especially on the coastline for the access to the sea as a very strong natural place. Moreover, the need of open space of proximity near the residential areas and of the well-known benefits of the coastal areas for health are increasing in the post-covid society. Water-based recreation has various positive effects on human health and well-being—in relation to physical exercise and mental well-being, which is one of the main reasons to pursue the widest possible access to the seaside (Bolund and Hunhammar 1999). The coastal area is also an important and often vulnerable habitat zone for flora and fauna which brings additional demands on such areas and also places them at risk from damage and degradation. Moreover, the natural risks, such as coastal erosion or landslides together with flooding, due to the current climate change, reclaim a special attention in designing green/blue infrastructure to solve the landscape fragmentation (Weissenberger and Chouinard 2015).

These fields of investigation are a central focus in my research developed in recent years at international and national level. Particularly I was engaged in three different projects.

Firstly, at international level, in the Erasmus + project "*WAVE. Water Areas Vision for Europe*" (2020–22), developed together with other European universities, the research tried to understand if the coasts of some European cities are actually designed and managed to meet the economic and socio-recreational expectations of citizens. For this reason, the research investigated specific areas of the sea/river cities, based on similar characteristics that allow for comparison (Constanta on the Black Sea in Romania, Tallinn on the Baltic Sea in Estonia, Naples on the Mediterranean Sea in Italy and Freising in Germany). To answer this question, the team analysed the coastal urban dynamics and the planning of these spaces, examining the efforts of public policies to ensure accessibility to coastal functions for all users and permeability between the coast and the rest of the city.

Since the waterfront influences the conformation of public spaces along the coast in relation to their use and perception, the research aims at integrating this theme in the ecological/landscape design through approaches such as green–blue infrastructure. The goal is to reconnect the heterogeneous fragments of contemporary sea/river coasts from an environmental and functional point of view, in order to support

the drafting of efficient planning for these areas, proposing hybrid and sustainable recreational spaces where punctual interventions can ensure greater social benefits (Bell et al. 2022; Badami and Ronsivalle 2008). Secondly, another developed international research was the Galileo project "*Re-SEA-ourcing CITY. City-sea interface as a resource for people: urban regeneration in the context of ecological transition*". The project is based on the partnership between the Department of Architecture of the Federico II University of Naples and the CNR IRISS, for the Italian part, with the CNRS (Centre National De La Recherche Scientifique) and the University of Aix-Marseille, for the French part. The aim is to analyse the city–sea interface looking at the opportunities for the regeneration of urban coasts. The focus is the reading of the coasts of large cities in a socio-recreational and landscape-environmental key for sustainable management and efficient planning (Acierno et al. 2021). The proposed research aims to compare the urban coasts of Naples and Marseille, exploring opportunities for enlarge the use of urban beaches and green open areas, places able to offer benefits and amenities for citizens, especially in post-covid era (Pilkey et al. 2011). The regeneration of the fragmented strips of green areas along the sea represents the idea of creating an extension of residential/commercial neighbourhoods for healthy open space useful for some particular diseases but also for creating opportunities to feel safer in emergency periods during covid crisis.

Thirdly, at national level, another proposal (not yet started) from an Italian team composed of five universities (University Alma Mater of Bologna, University of Siena, Polytechnic of Milan, Polytechnic of Turin and University Federico II of Naples) is aiming at investigating the relationship between the presence of green blue infrastructure and health of citizens. Only Naples, among the 5 cities analysed, is sited on the coast and characterised by a specific climate for the presence of the sea able to carry many benefits to people.

The awareness of the combined effects of the above-mentioned health-related environmental and socio-economic challenges, exacerbated by the climate, economic and COVID-19-related current crisis, it is fundamental to rethink urban planning approaches to enhance quality of life, health and well-being in our coastal cities.

Many studies provided evidence around the proximity to urban green areas and the reduced incidence risk of many chronic diseases, i.e. obesity, diabetes, mental health (Astell-Burt et al. 2014). Furthermore, a large number of studies investigated the linkages between park attractivity and physical activity (Gascon et al. 2017).

Such a body of studies evidences the need for carefully planning, distributing and designing a network of multi-functional and multi-scale Green and Blue Infrastructures (GBI), that are defined as '*a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services such as water purification, air quality, space for recreation and climate mitigation and adaptation. This network of green (land) and blue (water) spaces can improve environmental conditions and therefore citizens' health and quality of life'* (European Commission 2013).

In fact, the quantity and quality of urban GBI and their related accessibility are not always fairly distributed across urban areas, especially on the coasts (Kim et al. 2019). The evidence of the scarcity of green open areas near the sea is under clear

observation: on the coast port, traffic, commercial activities are more frequent than the leisure or relax ones. While studies concerning the perceived well-being and quality of life in relation to urban GBI are growing, the studies about the health chronic illness (e.g. type-2 diabetes, neurodegenerative illness and asthma), socio-economic indicators and urban GBI indicators in European cities are still poorly explored.

There is a strong need to understand how and where urban GBI and their services should be managed to deliver on multiple benefits to citizens. This subject remains poorly investigated and difficult for policymakers to incorporate into local policies and plans (Geneletti et al. 2020).

The main aim of the proposed research is to better assess the distribution of GBI to support urban planners and decision makers in taking decisions over land use priorities and regeneration opportunities, supporting social, environmental and health-related justice. The research aims at investigating and understanding the relations between urban morphology, GBI presence and quality, the socio-economic profile of the population and the incidence of specific diseases in populations in coastal cities, to provide recommendations for planning healthier and higher quality cities. The research will be focused on the impact of GBI planning (in terms of quantity, location and quality) on citizens' health and well-being to be verified among different coastal cities with different dimensions, latitudes, climate, socio-economic characteristics, living conditions and health-related issues and behaviours (Völker and Kisteman 2015).

The proximity of open spaces to residential/commercial areas near river or sea is a central issue in the post-covid society because it guarantees the opportunity to move around in green areas with limited risk. Moreover, the recreational activities developed in open spaces near water areas, as beaches or river coasts, are more effective than other open spaces sited in metropolitan cities (Moreno 2020).

The growing demand of coastal open spaces from urban users confirms the supposed basis of the research.

6.2 The Case Study of Naples

The case of Naples is interesting in comparison with other European cities located in central Europe. The climate is Mediterranean with mild and rainy winters and hot and sunny summers refreshed by the sea breeze. The best socio-economic conditions are found in the widespread urban system; the zones farther from the sea host less affluent sections of the population. Since many urban areas are closely related with the coastal and marine environment, the case of Naples will be exemplary in this sense. The case study of Naples offers the chance to study the relationship between the sea and the arise or decrease of incidence of particular pathologies. The proximity to the maritime element will in fact be the basis for a comparative gradient between coastal and inner zones, from the point of view of environmental benefits and spatial distribution of different social groups (Acierno et al. 2021; Vitale 2006).

Fig. 6.1 Main areas of Naples coast (Map data ©2021 Google)

The analysis in progress started from a selection of study areas on the coast of Naples: Bagnoli-Coroglio; Posillipo, Riviera di Chiaia, Molo S. Vincenzo, Port area, San Giovanni A Teduccio (Fig. 6.1).

The six areas were classified through the main features related to the natural characteristic or the use. Particularly Bagnoli and San Giovanni a Teduccio were classified as disused industrial land in regeneration, Posillipo is a green and residential area, Riviera di Chiaia is similar to an urban beach area, Molo San Vincenzo is an unused area to be classified as area in transition, finally the port area with the presence of different activities (passengers' traffic, commercial traffic, shipyard, containers docks).

The most relevant areas for the research are the urban beaches and all the natural open spaces, equipped or not, suitable for recreational uses where people are in touch with nature. In such a manner, citizens are able to develop open air activities and benefit from the contact to the sea.

The most natural area on the Neapolitan coast is Posillipo composed of cliffs and green areas where there a few beaches, usually privatised and consequently very difficult to access. The Riviera di Chiaia (Fig. 6.2) is an urban waterfront, in many parts only for pedestrians, where citizens and tourists can walk and spend their time, especially during the night for the large offer of restaurants. The urban beaches, despite the existing rules about their management and improvement, are very few and mainly concentrated in the middle of the Neapolitan coastline, even if not all of them are freely accessible by the users.

The coast, as in many ancient European cities, has a long history with a deep stratification of uses and land modifications, with a rich landscape but degraded in many parts. From S. Giovanni a Teduccio on the east to Bagnoli on the west, the Neapolitan coast is articulated in different landscapes and occupied by many

Fig. 6.2 Urban beach in Chiaia (Cosentino 2019)

activities considering the presence of the port and commercial/passenger traffic. It is evident a difficulty for population to access the sea and the beaches such as other open spaces useful for walking and relaxing. Moreover, access to the sea for recreational and leisure uses is particularly limited because of the presence of the port activities, the specific orography and often the privatisation of beaches.

The history of Naples' coast in last two centuries declares a progressive transformation with a growing degradation of public spaces. Some parts were less compromised and maintained the original naturalistic and landscape features, like in Posillipo and Chiaia, but other parts, as the former industrial areas, as Bagnoli and San Giovanni a Teduccio, experimented a deep modification in terms of access to the natural resources (Giovinazzi and Moretti 2010; Clemente 2011).

The areas of Bagnoli and San Giovanni have been for many decades the sites of industrial settlements which are now in abandonment and only partially reconverted. In both areas, the local population, composed by working class, claim green areas for young and elderly people such as the bathing use of beaches. In Bagnoli, during the last thirty years many plans and projects were produced but no one was carried on and it is a waiting area for transformation yet. In the east, the situation is more difficult because the port authority would expand its quays to meet the growing demand for container transport on huge ships, clashing with the aspirations of the users (Palmentieri 2016; Coppola 2020).

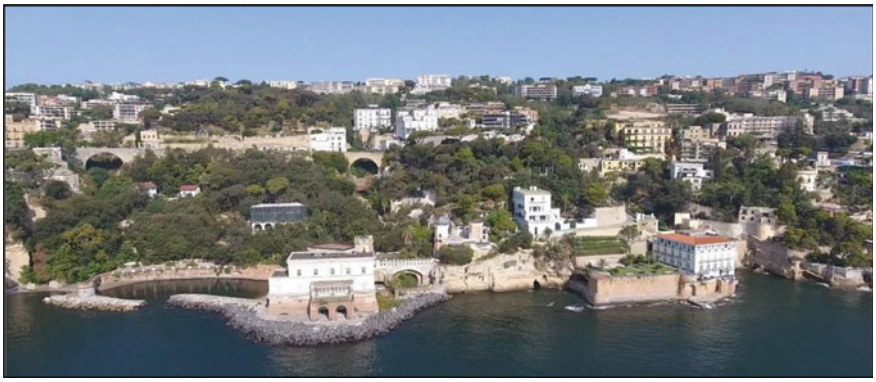

Fig. 6.3 Posillipo's coast (Image data ©2021 Google)

Along the coast from the east to the west, except for the two previous disused industrial areas, there are the other four interesting areas with high landscapes and historic values.

The Posillipo area up to Mergellina has an amazing landscape which is difficult to access considering the orographic features and the high fragmented system of private properties (Fig. 6.3). The coast is high and often rocky except for a few small coves which unfortunately allows access only to residents.

Mobility is difficult for the composition of the roads network consisting of narrow streets and limited parking areas. It represents a natural space mainly used by citizens sited in the district which is composed mostly from the wealthiest classes of the population. Moreover, many areas present high risks of landslides and the free access to them is not allowed despite the constant illegal use.

The area of Chiaia represents a real urban promenade and is characterised by low artificial rocks and small stretches of beach in which citizens are used to go for bathing. The waters are partially suitable for bathing, and the beaches are poorly or not at all equipped even if many Neapolitans have no doubt about considering the opportunity to swim in the sea there. After Chiaia, on the east side we find the area of Santa Lucia which is rich of restaurants, pubs and some cultural landmarks (Castel dell'Ovo, Borgo Marinari) attracting many tourists in the zone. From Santa Lucia, is it possible to reach by foot in a few minutes the San Vincenzo pier, the historic dock going into the sea for two kilometres and offering an amazing view of the city from the water. The pier at the moment is abandoned and inaccessible, except in occasion of events. In the last two decades, many re-development projects have been produced to give free access to the public space equipped with many recreational facilities for residents and tourists. The coastal area from Molo Beverello to Vigliena is occupied by the traffic/commercial activities and shipyard located in the port of the city.

All the areas analysed in the three above-mentioned research projects were studied in relationship with the recreational use opportunity and healthy benefits to citizens in terms of natural characteristics, anthropic uses and planning regulations. In the

Fig. 6.4 Naples' map representing the urban beaches and their level of equipment and bathing water (Commune di Napoli 2010, public source)

planning documents for Naples there is limited attention to the use of the open areas near the coast for giving opportunities to the population while the focus is mainly on the attractiveness for the tourism industry, despite the consequent degradation of natural resources (Papa 2010).

The municipal administration seems to have little stakes in the fate of public uses and coastal bathing representing a weak strategy for the city especially looking at the future needs related to post-covid society. The Regional Management Plan for Coastal Areas (Regione Campania 2019) is the only planning tool for the uses related to leisure and tourism in coastal areas but is limited to providing a few rules for the granting of concessions and the use of beaches. The metropolitan plan of Naples (Fig. 6.4) can represent one of the major opportunities for the management of proximity leisure areas along the coast in the perspective of building a territorial framework for bathing activities, equipped and green areas.

6.3 Conclusion

The two research projects are losed at the moment, while the third one is only a proposal, and we are collecting data about natural, physical and anthropic features together with the study of planning documents on the coast. The future lines of the research program are oriented to listen the local population about the social needs and aspirations using a specific questionnaire developed for the aims of the research. The expectations about the use of open spaces and nature near the coast with particular attention to the healthy benefits related to some diseases but also for the covid fears will analysed (Roggema 2020).

Moreover, the main aim of the research is to extract useful indicators for the description of the coastal areas and their potentialities for recreational and healthy uses. For gaining it the results of the analytical phase, based on the collection of physical/socio-economic data, integrated with the findings of the questionnaires, will be discussed highlighting the core features of coastal areas in terms of recreational/healthy benefits.

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Chapter 7
Ecosystem Services and Green Communities: Local Answers for the Revitalisation of Inland Areas in Post-Covid Era

Massimo Angrilli and Valentina Ciuffreda

Abstract The paper aims to develop a reflection on the strategic importance of green communities, starting from the concept contained in Italian Law 221/2015, on the role that ecosystem services (MEA, Ecosystems and human well-being: synthesis. Island Press, Washington, 2005) can play in the planning of natural areas and in the management of commons. The paper also intends focusing on those ecosystem services that could be central in the post-Covid era, considering the importance given to the quality and health of the mountain environment and to the opportunity for a repopulation boost. The contribution proposes two scales of application: the first is a hypothesis of use of the ecosystem services offered by the municipal area of Pacentro (AQ), located in the territory of the Maiella National Park in Abruzzo, as a development tool, able to counteract the economic and demographic impoverishment process, which has characterised the Central Apennines for over a century, and at the same time attract new residents from the metropolitan coastal area; the second is the result of ongoing research, applied to the inland areas of Abruzzo, and intends investigating the potential of participatory processes and in particular hopes for the creation of associations of local authorities, with a view to increasing sustainability, capable of recognising the value of the rural and mountain territories, to be exploited in a balanced way, their main resources, including first and foremost, water, woodland and landscape, exploring the ways whereby these factors can be transformed into active policies for the protection and enhancement of the territorial heritage, while highlighting the strategic role that urban planning can assume. The paper will underline the importance which a wide environmental census and measurements of the extent and condition of the stock of natural capital assets can take on, underscoring the financial value of ecosystem services as a potentially new driving force for the economy of mountainous areas. In this regard, the contribution

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will also highlight the potential of Payment for Ecosystem Service flows between inland areas (ES providers) and urbanised valleys (ES buyers), in order to avoid the impoverishment of the natural ecosystem and recognise the role of the landscape foundation of community identity.

Keywords Green communities · Ecosystem services · Inland areas · Natural capital · Wooded areas · Mountain · Environment · Landscape

7.1 Introduction

The inland Apennine areas of our country are affected by a manifest contradiction. On the one hand, they are considered marginal and neglected, while on the other, they are of the utmost importance as regards the conservation of natural resources. Biodiversity, drinking water, biomass and many other ecosystem services[1] are provided by the highlands, which human beings have gradually abandoned, leaving settlements and cropland and thereby permitting the woodland to thrive and occupy increasingly more extensive land areas.

The recent emergency linked to the SARS-CoV-2 epidemic has brought these values back to the forefront and the debate on whether depopulated or abandoned mountain areas could be newly inhabited by people inclined to leave the crowded cities to escape the future risks of new epidemics (Featherstone 2020), has gained momentum. During the lockdowns, numerous cases were observed of people moving out of the cities, attracted to the rural and mountainous areas of the country by a better quality of life, but also by the quality of the air and water and the absence of pollution.

This return of interest in villages offers an important opportunity for those studying the possibilities of economic revival, and in this perspective green community strategies acquire further relevance. This opportunity must be seized and a way must be found to quantify such natural capital and economically assess the ecosystem services it offers, including those aimed at the well-being and health of the inhabitants. The mapping of ecosystems and their systematic accounting, together with the inclusion of specific guidelines for the strategic development of green communities in land-use planning, are priority measures for economic assessment and entry into the voluntary market, in which a specific ecosystem service is sold to a buyer for a monetary consideration. This form of exchange, termed PES (Payment for Ecosystem Services), could convert environmental values, currently not taken into account by the market, such as water quality, into financial support for natural capital managers, thus ensuring the maintenance of many ecological functions offered by Natural Capital.

[1] Ecosystem services are subdivided into provisioning/sustaining services (of food, materials and energy obtained from ecosystems); systems for regulating ecosystem functioning; and cultural services, associated with the benefit obtained from recreational uses of ecosystems or natural assets.

After defining the legislative framework of the situation in Italy, research presents two fields of application. One at territorial scale, which outlines the naturalistic characteristics, the actions underway and the resources that make the Maiella National Park a potential driving force for the application of green community principles. The other, at municipal scale, concerns the inclusion of Green Community policies in the new municipal urban planning instrument (currently being formed), conceived as a tool to counter the process of economic and demographic impoverishment, with a census of the natural capital and ecosystem services that become part of the cognitive apparatus of the plan and its strategic aspect.

7.2 Institutional Framework

7.2.1 Italian Law 221/2015

At national level, the most important regulatory reference for green community policies is article 72 of Law 221/2015, which, in addition to introducing into Italian law numerous *"environmental provisions to promote green economy measures and to reduce the excessive use of natural resources"*, states, in paragraph 1, that the Department for Regional Affairs and Autonomies, in agreement with other departments, shall promote the preparation of the national strategy for green communities.[2]

The national strategy aims to identify "*the value of rural and mountain areas which aim to make a balanced use of their main resources, primarily water, woodland and landscape, and to open up a new subsidiary and exchange relationship with urban and metropolitan communities, so as to be able to set up, in the green economy phase, a sustainable development plan, not only from an energy, environmental and economic point of view, in the following fields: (a) integrated and certified management of the agro-forestry heritage, including through the exchange of credits deriving from the capture of carbon dioxide, biodiversity management and certification of the wood supply chain; (b) integrated and certified management of water resources; (c) energy production from local renewable sources, such as micro-hydroelectric plants, biomass, biogas, wind power, cogeneration and bio-methane; (d) development of sustainable tourism, capable of enhancing the value of local production; (e) energy efficiency and intelligent integration of plants and networks; (f) sustainable development of production activities (zero waste production); (g) integration of mobility services; (h) development of a sustainable farm model which is also energy*

[2] To this end, the Department has set up a round table with the Ministry of the Economy and Finance, the Ministry of Infrastructure and Transport, the Ministry of Cultural Heritage and Activities and Tourism, the Ministry of Agriculture, Food and Forestry and the Ministry of the Environment and Protection of Land and Sea.

independent through the production and use of energy from renewable sources in the electricity, heating and transport sectors[3].

The institutional debate generated following the enactment of this law has highlighted a number of crucial aspects of the strategy, both in terms of the size of green communities, and of defining the factors which will determine their success in the field of application.[4] The first strategic issue is the definition of parameters for setting up the communities; to this end, it is desirable to use the aggregations of municipalities already operating in marginal contexts, such as Associations of Municipalities, former Mountain Communities, protected areas, parks and Local Action Groups (GAL), thus pooling resources and actions for the "green" qualification of already-operating communities. By building on existing initiatives, the green community can act as a multiplier factor, capable of reinforcing the green economy measures already taken, while at the same time limiting the excessive use of natural resources.

The second strategic issue is the need to integrate the green community strategy with other national strategies on related issues, first and foremost the national strategy for inland areas, but also the national energy strategy, the national strategy for the circular economy, the Italian biodiversity strategy and the strategy for the architectural heritage. This will make it possible to integrate coherent and synergic actions, including in order to find resources and make up for the lack of funds allocated by Law 221/2015.

7.2.2 The National Recovery and Resilience Plan. Opportunities for the Post-2020 Phase

The recent publication of the National Recovery and Resilience Plan in Italy has rekindled interest and debate on green communities and ecosystem services. In fact, in Mission 2 'Green Revolution and Ecological Transition', funds amounting to EUR 140 million have been allocated for 30 green communities (Mission M2C1 on Circular Economy and Sustainable Agriculture, Investment 3.2).[5] As a whole, the NRRP proposes development guidelines aimed at reducing the gap between mountain and urban areas, the latter playing a leading role in economic, social and institutional processes. In addition to the fragility of inland and mountainous areas, the fragility also exists of small municipalities, which are mainly located in the Alpine

[3] Law 28 December 2015, no. 221, art. 72 "Provisions on environmental matters to promote green economy measures and to reduce the excessive use of natural resources. Official Journal General Series no.13 dated 18-01-2016). https://www.gazzettaufficiale.it/eli/id/2016/1/18/16G00006/seq".

[4] Department for Regional Affairs and Autonomies. Public consultation for the formulation of the National Green Communities Strategy.
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[5] National Recovery and Resilience Plan. #nextgenerationitalia. Definitively approved on 13 July 2021 by Council Implementing Decision, which transposed the proposal of the European Commission.

and Apennine areas. As many as 69.7% of Italian municipalities are small ones with less than five thousand inhabitants. In the light of the new scenarios foreshadowed by the pandemic, we need to rethink rural and mountain centres as places to live and work, enhancing their natural, social and building capital, and going beyond the nostalgic vision whereby they are relegated to being just Sunday tourist destinations. As is well known, in addition to their important natural capital, mountain centres have a significant stock of underused houses. According to UNCEM estimates, 1 house out of 3 in small municipalities is uninhabited, and the recovery of part of this heritage (15%) could be worth 2 billion euros.[6]

The NRRP is therefore the first major opportunity to implement the green communities strategy established by Law 221/2015, the principles of which anticipated the European "Green New Deal".

In addition to the green communities strategy, two other legislative initiatives have also played a role in the allocation of NRRP funds to mountain centres: Law 158/2017 "Measures for the support and development of small municipalities, as well as provisions for the redevelopment and recovery of the historic centres of the same municipalities"[7] and Legislative Decree no. 34 dated 3 April 2018, "Consolidated Act on Forests and Forestry Supply Chains" (TUFF).[8]

This latter law, which constitutes the framework for guiding and coordinating silviculture and forestry sectors, is particularly relevant for the purposes of this paper, and is also relevant because of the rate of increase of the forest area on national land, equal to about 54,000 ha/year,[9] which has increased woodland cover by more than 600,000 ha in 10 years, equivalent to about 2% of the national territory. The TUFF is in fact aimed at: "improving the protective and productive potential of the country's forest resources and the development of local supply chains connected to it, enhancing the fundamental role of silviculture and placing public interest as a limit to private interest"; all objectives perfectly in line with the aims of green communities.

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[6] Data taken from the Report "*Mountains and green and intelligent territories in the National Recovery and Resilience Plan*", published in March 2021 by UNCEM (National Union of Mountain Municipalities Communities and Entities).

[7] The focal point of Law 158/2017 is the establishment of the Fund for the structural, economic and social development of small municipalities, with a total allocation of €100 million, from 2017 to 2023. For the use of the resources, the preparation of a National Plan for the Redevelopment of Small Municipalities is envisaged. Some of the aims of the plan are the environment and cultural heritage, the mitigation of hydrogeological risk, the safeguarding and urban redevelopment of historic centres, the securing of road infrastructure and schools, the promotion of economic and social development and the establishment of new productive activities.

[8] The Consolidated Act on Forests and Forestry Supply Chains (Tuff)) represents the new *national framework law on silviculture and forestry supply chains*, defining unitary regulatory guidelines and sector coordination for the Regions and the competent Ministries.

[9] Data source: "Protection and valorisation of the Italian forest heritage. A challenge for the future". Document produced in the framework of the National Rural Network Programme 2014–2020, by Raoul Romano. Available online: https://www.reterurale.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/16437.

7.3 Context

7.3.1 Mountain Areas, Forests and Ecosystem Services

According to data from the National Inventory of Forests and Forest Carbon Sinks (INFC 2015), the recovery of woodland from 1971 to 2011 affected about 3.5 million hectares of land, mostly subtracted from agriculture and grazing. In the years between 2005 and 2015, this woodland expanded further and today Italian forests cover a total of more than 11 million hectares,[10] compared to 4 million in 1930, with a forestry coefficient (the ratio of forest area to national territory) of around 39%. In the inland areas, there are as many as 9 million hectares of woodland, which today give a substantial helping hand to the country, avoiding EU sanctions, inasmuch as they "[…] contribute massively to the fixation of carbon dioxide, covering a large part of the budget which at national level is annually accounted for to meet the commitments made in the Kyoto Protocol" (Marchetti 2017, p. 33).

What to do with this natural capital and how to take its value into account in policies aimed at revitalising inland areas post-pandemic? Despite being essential services for human life, in fact, their importance is largely underestimated, as they are not traded on the market and have no price to indicate their social value. An implicit appreciation of their value did however come from what happened in the wake of the pandemic, with the desire of many urban dwellers to move closer to areas where woodland offers guarantees on air quality and sanitation.

However, a methodology needs to be developed which, after having surveyed and quantified the available natural capital, enables it to be assessed in monetary terms. This must be done by mapping ecosystems and accounting for the services they provide, together with the inclusion of specific guidelines for the strategic development of green communities in regional planning.

This methodology must take into account what the Italian Natural Capital Committee, in collaboration with ISPRA and ISTAT, is doing in its annual reports, with the aim of assessing *ex ante* and *ex post* the impact of public policies on the physical state of natural capital. Subsequently, an estimation of the monetary value of the ecosystem services produced could quantify, using different methods (shadow price, substitution price, hedonic price, avoided costs, etc.), the remuneration due to providers for the tangible and intangible benefits obtained (Marino 2017).[11]

[10] The latest survey of the Ministry of Agriculture, Food and Forestry Policies, published in the dossier "Tutela e valorizzazione del patrimonio forestale italiano" (Rome, 2017), mentions 9,297,078 ha of forest, plus 1,813,237 ha of other wooded land, for a total of 11,110,315 ha, distributed over an area of 30,132,858 ha, or 35% of the national land area.

[11] In this regard, see the project *LIFE + Making Good Natura—Making public Good provision the core business of Natura 2000* (2012–2016).

7.3.2 *Woodland Heritage and Inland Areas*

Everyone knows that woodlands offer environmental services to the benefit of the land area as a whole, even the more urbanised valley and coastal urban centres: carbon fixation and storage, soil protection, water regulation, landscape and biodiversity conservation are just some of the numerous benefits provided. From this point of view, it will be necessary to investigate the opportunities related to the compensatory relationship to be established between territories that disperse and territories that produce ecosystem services, especially in the perspective of the new exchange relationship between urban and rural centres in the post-Covid era.

Indeed, it is only possible to consider the value of natural capital, which is abundantly present in mountain areas, in a logic of cooperation and exchange with urban and metropolitan communities, which are the main beneficiaries of ES.

In this perspective, the view whereby the highlands are marginal and peripheral to urbanised lowland areas should be set aside to make room for a new paradigm that considers the two entities as part of an enlarged and cohesive region, where exchanges take place in a balanced way.

Figure 7.1 helps us to demonstrate that the areas identified by the National Strategy for Inland Areas coincide almost totally with the areas of distribution of woodland, and that this heritage plays a crucial role in reducing air pollution. This is an observation of some interest in the context of the debate that the pandemic has raised on the role of air pollution in exacerbating the risk of contracting Covid-19 and other respiratory diseases.

The air-quality benefits of woodlands are not confined to inland rural and mountain areas, but extend beyond them to urbanised stretches along the coast, which suffer from air pollution problems.

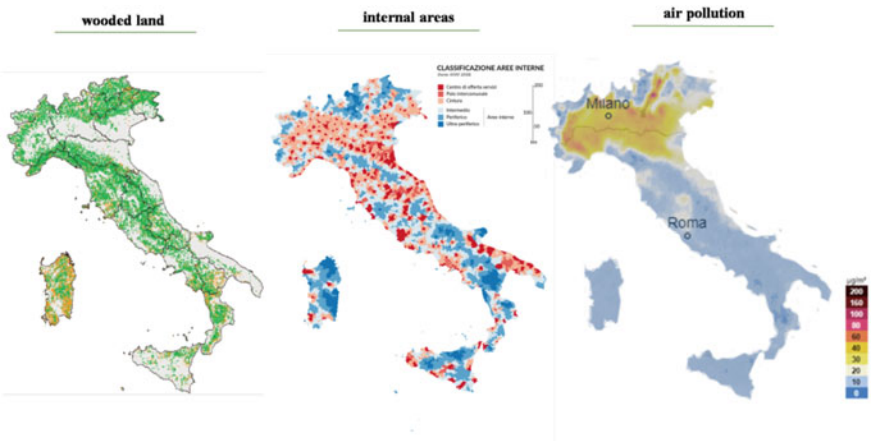

Fig. 7.1 Comparison of woodland areas, inland areas and air pollution (*source* authors)

Although in Italy no precise and widespread mapping of the value of the ecosystem services provided yet exists, it has been estimated that[12] two-thirds of the value of ecosystem services are produced in inland areas, which represent, as already stated, 60% of Italian municipalities. The demand for ecosystem services expressed by inland areas amounts to about one fifth of the total provided ES, so the surplus is all to the advantage of urban areas and the metropolitan system. Achieving a new balance between the great wealth of natural capital and the growing impoverishment of human and economic capital is one of the great challenges of the National Strategy for Green Communities. This is a challenge that regional planning must be able to take up immediately, directing interest and expectations in the post-2020 phase towards a concrete vision of revitalising housing, for example by laying the foundations for recovering the heritage of abandoned houses present in significant quantities in many mountain centres.

7.4 Strategies

7.4.1 Natural Capital in Territorial Planning

In which field can the discipline of town planning and the study of the landscape can be placed in relation to natural capital? The answer to this question is partly contained in the relationship between the environmental system, with its natural capital providing ecosystem services, and the socio-economic system, which not only benefits from these services, but also exerts pressure such as to compromise their qualitative and quantitative status.

It is in this relationship that policies come into play, which can and must break this link. Clarifying this aspect is the second report on natural capital,[13] which emphasises the importance of territorial planning, called upon to concretely guide actions linked to the transformation and management of the territory, with special focus on protected areas, calling for integrated planning and coordinated management of ecosystem services, with the involvement of local communities, scientific research and interregional cooperation. As evidence of the importance that natural capital assumes within planning decisions at every scale, from local to national, it is noted that in 2022, Parliament introduced the protection of biodiversity and ecosystems as fundamental principles in the Constitution (CCN 2022). In fact *«[...] the opportunity to initiate non-controversial planning, management and co-operative planning with local communities is the real breakthrough that has occurred in recent years [...]. Local communities play indeed a central role and their presence [...] guarantees the quality of ecosystems, economic development and widespread care of the territory.»* (Pierantoni and Sargolini 2020, p. 29).

[12] For more in-depth information on the topic, see: Borghi (2017) *Piccole Italie*, Donzelli, Rome.

[13] CCN—COMITATO CAPITALE NATURALE (2018), *Secondo Rapporto sullo Stato del Capitale Naturale in Italia*, Rome.

The complexity of the definition of ecosystem services leads to a broader reflection on the concept of service, no longer regarded as «nature subjected to human needs». Hence, the most appropriate definition, as suggested by Magnaghi (Poli 2020, p. 12), would be that of "ecosystem use value", with economic evaluation no longer considered a simple form of commercialisation of nature (Costanza 1989), but simply a way to manage natural capital more efficiently, at both public and private levels.

7.5 Applications

7.5.1 The Abruzzo Region and the Maiella National Park

The concentration of natural capital in inland areas highlights the paradox, mentioned at the beginning of the paper, regarding the idea of marginality. Inland areas (Agenzia per la Coesione Territoriale 2013) are defined as marginal because of their distance from the places where services and places of production are concentrated; but from the point of view of the provision of ecosystem services these same areas are in a position of absolute centrality, a condition able to trigger opportunities for revitalisation based on the management of natural capital. As has been said, one of these opportunities is represented by the movement of people who, during the pandemic, chose to move their place of residence, albeit only temporarily, from the cities to rural and mountain centres.

On the basis of these assumptions, the research project defined the experimental area by overlapping thematic maps (Fig. 7.2) of the Abruzzo region. The first overlap compared the geography of the inland areas with that of the associations of municipalities operating within the region, in view of their participation in Project Italiae, which intends launching a series of experiments on the theme of Green Communities, supporting the Department for Regional Affairs and Autonomies in the construction of the national strategy. A second overlap concerned the associations of municipalities and the perimeters of parks (regional and national), thus enabling potential synergies to be exploited between policies for the management of common services and policies for the conservation/enhancement of natural resources. A third overlap was made between protected areas, national and regional parks and areas where river contracts are being promoted for the regeneration of river basins, the latter being a form of voluntary collaboration between municipalities around a common asset. The construction of a matrix (Fig. 7.2), which crosses the geographical areas affected by the various methods of sharing common objectives mentioned above, is the starting point for identifying areas in which to experiment with green community policies in a mountain–rural–urban continuum.

From an initial interpolation of data, the territory of the Maiella National Park and that of the Sangro river basin emerged as possibilities for vast area experimentation. Interest in the Maiella National Park area is also supported by the findings of the

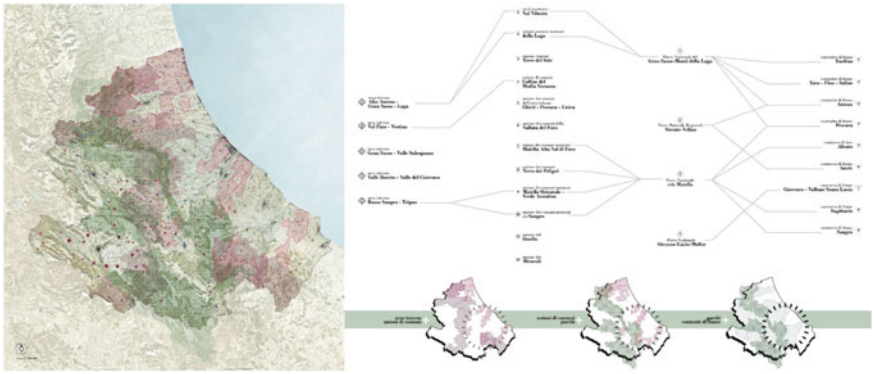

Fig. 7.2 Preliminary studies for the creation of a green community in Abruzzo (*source* authors)

third report on natural capital, in which the Abruzzo park appears to be virtuous due to its low rate of land consumption and the diversity of its ecosystems.

7.5.2 The Natural Capital Census in the Municipality of Pacentro

On a more local scale, the municipal area of Pacentro (AQ) was identified as that on which to focus experimentation. There were two main reasons behind this choice. The first is geographical: the municipality of Pacentro lies within the perimeter of the Maiella National Park, thus enabling the observations and hypotheses made on a small and large scale to be related. The second is of a more pragmatic nature: in the municipality of Pacentro, in co-planning with the Maiella National Park, the new PRG (General Town-Planning Scheme) is being drawn up, and a census of natural capital and disused housing stock has been carried out with a view to their possible use in a new post-2020 economic and social cycle. The national green communities strategy was considered by the working group involved in drafting the plan.[14] As an opportunity to experiment with innovative ways of managing wooded and agricultural open land. The natural capital of the municipality is placed at the centre of its future socio-economic development, its being believed that Pacentro, like the other rural and mountain centres rich in biodiversity in the Majella area, should promote initiatives for the economic, non-disposable development of environmental resources.

Among such initiatives, post-Covid residential promotion was also considered, taking advantage of the heritage of uninhabited houses in the historic centre and also of the interest shown by many foreigners towards this centre (many of whom have been living in the Pacentro municipality for some time).

[14] Studio Landsite: Arch. Rocco Corrado (appointed designer), Sabina Minnetti with Laura Ciccanti; Scientific Consultant Professor Massimo Angrilli, with Arch. Valentina Ciuffreda.

On the basis of these reflections, the experimentation in the Apennine area of Pacentro has produced investigative works such as the census of natural capital (Fig. 7.3), which distinguishes woodland areas (divided into municipal and private woods), pastureland (also distinguished according to the owner's status) and agricultural areas with tree crops; a census of abandoned real estate, which aims at cataloguing buildings that have been uninhabited for a long time and are in a dilapidated condition, in order to reintegrate them into the vital fabric of the town, through processes of redevelopment and enhancement for residential, commercial, craft and tourist-receptive uses. Finally, through a strategic vision project, the plan considers the green community of Pacentro as a policy for contrasting abandonment processes; a way of supporting forms of tourist development compatible with the care and maintenance of existing environmental and landscape values and with the correct conservation and use of the woodland heritage and of primary resources, and in particular of water resources (Fig. 7.4). The census shows a considerable capital of water resources, together with the large heritage of woodlands and pastures that still today reflects the agro-sylvo-pastoral vocation which over the decades has characterised the territory of Pacentro, a town like many others in the mountainous interior of Abruzzo which was until the middle of the last century linked to sheep farming, its events and the lifestyles it determined.

On the basis of the Plan documents, in the future it will be possible to establish a platform where bilateral agreements can be drawn up between entities benefiting from ecosystem services and the agro-forestry world, including areas of land used

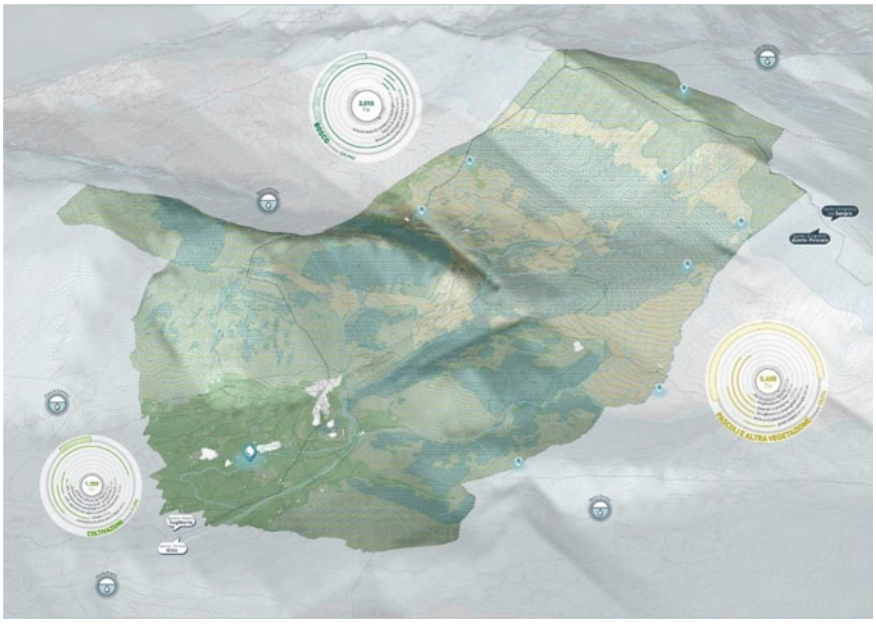

Fig. 7.3 Natural capital census map (*source* authors)

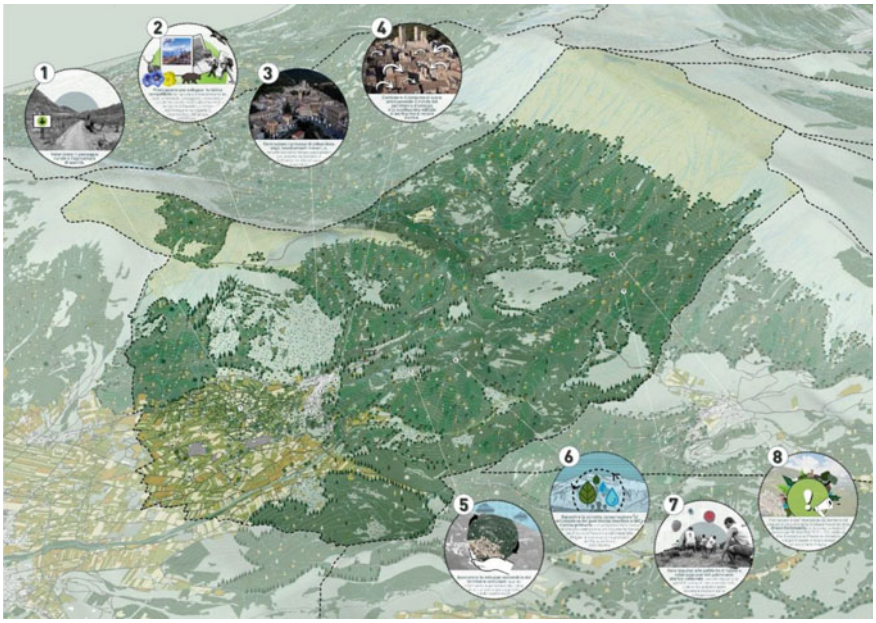

Fig. 7.4 Guide vision and sector strategies (*source* authors)

for woody agricultural crops. The latter, through virtuous practices, should commit to maintaining and possibly increasing certain types of ecosystem services on offer, particularly those relating to supply (such as the production of drinking water, wood materials for construction or combustion, etc.) and regulation (such as climate regulation, hydrogeological stability, etc.). Those farmers who wish to participate should take on the task of carrying out one or more identified activities and be paid according to the types of ecosystem services they provide. At the same time, the GHG emitters interested in buying should pay for the services they receive. An example of this would be a possible agreement between water service companies (buyers) and forest owners in the catchment area (providers) for the latter to undertake, in return for payment, to manage woodland according to good practices that ensure the constant conservation of water runoff quality and quantity over time (LifeMGN 2016).

7.6 Conclusion

Although research is still under way, it is possible, at this stage, to anticipate some conclusive considerations. The first derives from the experience of the PRG (Town Planning Scheme) of Pacentro, which has highlighted the difficulty, when working on the natural capital of a single municipality and in the absence of a wider territorial vision, of grasping the right dimension of problems and opportunities. This is the

reason why article 72 of the environmental agreement, as already mentioned, assigns the task of drawing up a sustainable development plan for green communities to associations of municipalities rather than to individual ones. Unfortunately, it must be noted that in many geographical areas there is a continuing difficulty in setting up associations of municipalities, or other forms of aggregation and coordination. This is due both to an anachronistic desire for self-determination on the part of small towns, often inherited from history (towns in the Apennine mountains bordering each other almost always have difficult relations), and to a lack of willingness to cooperate and share long-term programmes. These factors complicate and often condition the ability to look beyond one's own administrative borders.

The second consideration concerns the relationship to be established between ordinary Territorial Planning and the Sustainable Development Plan for Green Communities (PSSGC). Because the latter is a strategic tool aimed at identifying resource management objectives (water, forestry, agriculture, energy) but also at foreshadowing forms of development in the tourism, construction, mobility and production sectors, involving public and private (and other) stakeholders in these activities, its role in relation to territorial planning (individual municipalities or associations) will be very important. For these reasons, the regions and autonomous provinces will have to very carefully specify the forms and ways whereby the PSSGC is to deal with issues where potential overlaps may exist with territorial planning decisions. At the same time, it is desirable that there be dialogue and integration between the instruments; if the PSSGC are to all intents and purposes strategic plans, then they will be unable to manage the conformative aspects of land use, and will necessarily have to refer these to ordinary territorial and urban planning.

The integration of GC policies in planning could result in the greater effectiveness of the policies themselves, the full implementation of which will require the preparation by territorial and urban plans of new analysis and project documents—such as the aforementioned census of natural capital—and others relating to the issues of sustainable building and production systems and the provision of infrastructures for the modernisation of mountain contexts. Furthermore, in the case of green communities that fall within park borders, it will be appropriate to compare and possibly reconcile the proposals of the PSSGC with those of park plans.

Finally, a very important issue is the relationship between mountain GCs and the urban and/or metropolitan area of reference: in the perspective of a new post-2020 normality, this relationship can only be one of strategic alliance towards common objectives, including the need to bridge the gaps that currently exist, first and foremost that of access to services (health, education, mobility) but also the digital divide, which, as is well known, greatly penalises mountain centres; and then that of access to the world of work for young people. Without these prerequisites, the media wave that has turned the spotlight on mountain centres as possible places to live and work, as an alternative or complement to the large urban and metropolitan centres, will end up as a transitory practice, mainly involving workers in the most advanced sectors with good financial resources and (often) a second home in the countryside/mountains from which to telework only at certain times of the year (and only for professions suited to this way of working).

In the application case discussed here, which mainly includes the municipalities included in the perimeter of the Maiella National Park, it can be seen that the demographic variation in the period 2011–2017 stands at −4.21%,[15] against −7.83%[16] of the Basso Sangro Internal Area -Trigno, demonstrating the fact that the presence of the Park, with all its associated services, represents an important added value. The difference between the two percentages, albeit based on a restricted sample, raises a series of observations on the value that an area characterised by such strong biodiversity brings to living in these places and to the economy that can be consciously activated. Although the phenomenon of depopulation is much more complex and requires a multisectoral and multilevel analysis to be understood and limited, as has already been done for years through the National Strategy for Internal Areas, it should be remarked how recently the processes linked to residence and the binomial life-work, as described above, have favoured repopulation, or at least slowed the abandonment of these geographical areas. The reasons behind this trend are many: «a first identity/value countertrend in which the internal areas impose themselves in the collective imagination as authentic Italy; the return of young people, who start coming back to inland areas and to earn a living there, combining knowledge, even on the technological frontier; the aspiration of the urban professional bourgeoisie, which looks at these territories as possible places of life» (Barbera and De Rossi 2021, p. 255). The phenomenon already underway has been amplified by the pandemic and post-pandemic period 2020–2021, a moment in which the relationship between urban areas and inland areas has been redesigned, sanctioned by the flow of people, as many have chosen to return to live in small towns, appreciating the higher quality of life.[17]

Although we do not have sufficient elements of evaluation to establish whether this trend will be confirmed over time, we can empirically look overseas at a similar phenomenon, already begun in the early 2000s, which can make us cautiously confident and allow us to hope that this trend towards brain gain, thanks to the push of targeted strategic guidelines, can progress and increase.[18]

The search for isolation and a healthy environment are certainly valid motivations, but much more is needed to make this trend a new, stable and lasting normality, and

[15] Source: Census Istat 2011–2017.

[16] Source: Organizational Area Dossier—The National Strategy for Internal Areas and the new institutional arrangements—Internal Area Basso Sangro-Trigno, Abruzzo Region https://ot11ot2.it/sites/default/files/aree-interne/dossier/Abruzzo%20-%20DAO%20Basso%20Sangro%20Trigno.pdf (Accessed 05/19/2022).

[17] The situation described is photographed by the analysis of Istat data on a municipal basis relating to the internal migration balance, that is to the transfers of residence to and from another Municipality in relation to the resident population, analyzed in relation to the years 2019 and 2021, reported by the newspaper Il Sole 24 Ore https://www.ilsole24ore.com/art/il-covid-spinge-i-centri-minori-e-accelera-fugagrandi-citta-AE7KJIWB (Accessed 05/20/2022).

[18] Reference is made to an article dated 09/17/2019 that appeared in the New York Times: https://www.nytimes.com/2019/09/17/opinion/rural-america.html (Accessed 03/06/2022).

not just a new form of seasonal residence. In this sense, green communities offer a more solid perspective, not romantic but based on a sense of community and work.

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Part II
COVID Inducted Changes in Design Strategies and Building Typologies

Chapter 8
Design Strategies for Re-Thinking School Environments Post-Covid

Enrico Sicignano, Pierfrancesco Fiore, Carmelo Falce, Emanuela D'Andria, and Rossella Marmo

Abstract With the Sars-CoV-2 pandemic, a number of critical issues emerged related to the worldwide shortage of adequate facilities to handle an emergency of such severity. Public buildings, due to their strategic role in contemporary society, present great challenges in terms of spatiality, functionality and logistics. The pandemic's speed and gravity did not lead to timely operational arrangements, particularly with regard to the most crowded buildings. This is the case of school buildings, which, due to their use, are considered places of high pandemic proliferation. That is why action protocols have imposed physical distancing, with the aim of reducing the contagion risk. For this reason, from the very beginning, the most common strategies in the world of education included the stopping of in-presence service delivery, favouring the use of remote connection. The objective of this paper is to identify design parameters for the construction of new school structures or for the adaptation of existing school structures, in order to allow the continuity of teaching functions even under secure conditions. To this end, the research starts by comparing the directives and regulations implemented by a number of European countries on the basis of organisational and behavioural criteria in order to ensure that teaching activities can be carried out in complete safety. This preventive survey provides basic information which, by virtue of the specific conditions of applicability, can be deepened to evolve into behavioural, technological or spatial-functional indications in order to adapt school services and spaces in the event of future needs.

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8.1 Introduction

The SARS-CoV-2 virus, due to its sudden spread and unexpected rate of contagion, has put a strain on the health systems of countries all over the world. In parallel with the vaccination campaign, it is advisable to avoid the proliferation of the virus through strategies aimed at reducing interpersonal contacts. In fact, it is objectively recognised that this respiratory syndrome is mainly spread by respiratory droplets with a diameter of < 5 μm, which are responsible for the transmission of the virus in question when subjects presenting respiratory symptoms are in close contact—less than a metre apart - (WHO 2020). Numerous studies (Domingo et al. 2020; Hadei et al. 2020; Klompas et al. 2020; WHO 2020) have looked at the mechanisms of viral transmission via airborne microparticles known as micro-droplets or aerosols (size ≤ 1 μm). The greatest danger arises from prolonged exposure to infectious particles, especially in enclosed and inadequately ventilated spaces.

For example, as reported by Nishiura et al. (2020), the infection rate in a confined space is 18.7 times higher than in an outdoor environment. In addition, Hu et al. (2020) show an increased chance of infection in the presence of an infected person for people in crowded buildings for relatively long periods of time. In these cases, scientific research confirms that, in the absence of mechanical ventilation (MV) systems, it is advisable to at least resort to natural ventilation (NV), a method historically used to combat epidemic diseases (Morawska and Miltono 2020). For this reason, the American Society of Heating, Ventilating, and Air-Conditioning Engineers (ASHRAE) and the Federation of European Heating, Ventilation and Air Conditioning Associations (REHVA) have provided appropriate recommendations on the control of ventilation systems in closed and crowded environments (ASHRAE 2020; REHVA 2020).

At the same time, prior to the vaccination campaign, in addition to constant ventilation of rooms in public buildings and shared spaces, the only strategy aimed at containing the risk of infection was interpersonal physical distancing, understood as the need to ensure a distance of 'at least 6 feet (about 2 arms' length) from other people who are not from your household in both indoor and outdoor spaces' (CDC 2019). However, different European countries have adopted different provisions in order to avoid excessive disruption of training and teaching methods. On the other hand, the Sustainable Development Goals (Web-1) 3 and 4 of the UN 2030 Agenda call for 'good health and well-being' and 'quality education' respectively, jointly highlighting the need for safe learning spaces that contribute to reducing health risks. From these guidelines derives the need to change the behaviour of users of school facilities and adapt the spaces used to the new educational, social and health demands placed on educational environments, including in health emergencies. Rather, the emergency condition could represent an opportunity to rethink

and redesign the spatial and functional organisation of existing schools, taking into account educational, health and functional aspects. Consequently, starting from the impossibility to build new school structures in a short time, this study provides the first results of a research started at the Architecture Laboratory of the Civil Engineering Department of the University of Salerno regarding the definition of new design strategies for the rethinking of school environments. In order to adequately characterise the intervention strategies, it is necessary to subdivide them into areas of applicability linked to "behavioural" aspects, requiring the collaboration of the users of the school facilities in order to avoid incorrect practices; "adaptive", with the aim of arranging a different organisation of the teaching spaces; "systemic", to act on the purely technological components of the building.

8.2 European Countries' Action Strategies

Even before the spread of the contagion, school environments were designed in accordance with precise dimensional references. For example, the Italian school system, in accordance with the Ministerial Decree of 12 December 1976, the Ministerial Decree of 26 August 1992 and Law no. 23 of 11 January 1996, assigns dimensional standards to each level of education. These standards—which, first and foremost, consider the safety of the users—derive from pedagogical, organisational and administrative criteria. On the basis of these determinations, Table 8.1 shows a summary of the size criteria of the Italian reference system. Starting from the legislative indications adopted by each country regarding the organisation and distribution requirements of school environments, each State has established different lines of action and indications in order to guarantee the regular performance of educational activities in safety. In-presence teaching at all levels of the education system was one of the first activities to be suspended due to the health emergency-despite the fact that Covid-19 proved to be more dangerous for older age groups—(Grek et al. 2021). Digital education has been and still is a limiting measure, since there are already negative effects with clear repercussions in terms of training and psycho-physical well-being, compared to the expected benefits (Web-2). The various European countries have worked constantly to guarantee the continuation of teaching in the classroom, albeit at different times and in different ways, adopting, in borderline cases, the system of emergency or digital teaching, alternating it with openings and closures on a one-off basis, depending on the course of the infection curve.

For example, in countries such as Romania, between 2020 and 2021, schools were obliged to suspend lessons for around 32 weeks and only 60% of students were able to access lessons online. In Slovakia, only 60% of students had the means to access online classes (Web-3). In the UK, one in five students had no access to the Internet. A recent UNICEF report confirms that at least one third of pupils worldwide were unable to access distance learning (UNICEF 2020). On the other hand, in countries such as Sweden, some remote learning methods or hybrid forms of education had already been implemented prior to the pandemic (European Commission 2019). It

Table 8.1 School building standards

Standard	U.M.		Kindergarten	Primary school	Secondary school	High school
Gross sur. area/section	[m^2/s]	min	198	153	201.50	166
		max	210	167	275.50	307
Total gross sur. area/ student	[m^2/s]	min	6.06	6.11	8.06	6.65
		max	7.00	6.68	11.02	12.28
Net surf. area/student	[m^2/student]	–	1.80	1.80	1.80	1.96
Inter-floor height	[m]	–	3.00	3.00	3.00	3.00
% external green area	[adim]	–	66.6%	66.6%	66.6%	66.6%
Minimum area width	[m^2]	min	1.500	2.295	4.050	6.620
		max	6.750	12.550	16.600	33.900

is for this reason that mixed systems of education, also known as integrated digital didactics, are starting to be experimented more and more frequently in different European countries, as in the Italian case (Web-4).

The reference framework presented provides information on European strategies for tackling the pandemic problem, with reference to the world of education. It should be pointed out from the outset that the measures to prevent contagion are constantly being updated in line with new scientific evidence or the numbers of the vaccination campaign. Table 8.2 summarises the organisational and preventive measures taken in the school systems of some European countries. On the basis of the information examined, it is clear that the main measures are physical distancing and the widespread use of personal protective equipment such as face masks. Indeed, according to an ECDC report (2021), the combination of distance, hygiene and testing strategies make a significant contribution to reducing virus transmission in schools. To this end, in order to reduce the risk of airborne/droplet transmission and consequently avoid the suspension of school services, European countries have resorted to various measures such as restricting access to symptomatic persons, physical separation, the use of masks, constant sanitation of environments, proper hand hygiene, and adequate air changes. With regard to non-pharmacological prevention measures, interpersonal distancing is the most common. This measure is managed by considering different indices in the reference countries: in Italy the distance between each student is 1.00 m and 1.90 m^2 per student; in France the area per student is about 4.00 m^2; in Spain and Germany the distance is set at 1.50 m, while in the United Kingdom it is at least 2.00 m. In the case of education, physical distance is understood as the minimum distance between desks or, as in the Italian case, between pupils' mouths. If, with regard to interpersonal distancing, clear discrepancies and different approaches have already been identified according to the country of reference, the situation is even

more confused with regard to the use of personal protective equipment. With regard to the use of face masks, there are different indications: although in Italy in September 2020 the use of the device was not compulsory if a distance of at least one metre was guaranteed, subsequently the use of masks became compulsory. In Spain, the use of devices is compulsory from the age of six; in France it is compulsory regardless of age; in Germany, the use of the device is at the discretion of the individual Laender (also with reference to infection rates); in the UK, the compulsory use of the protective device is a decision to be taken by the management of the individual school.

If interpersonal distancing and the use of personal protective equipment are the 'basic procedures' adopted worldwide to contain the contagion (before and even after the advent and spread of vaccination strategies), it is worth highlighting that the countries of the European Union responded heterogeneously to the health emergency connected to the first and second 'waves' (OECD 2021), with reference to the world

Table 8.2 Organisational and preventive arrangements in some European countries

Country	Italy	Germany	Spain	France	UK
Distancing	1.0 m, 1.8–1.9 m^2/student	1.5 m	1.5 m	1.0 m, 4 m^2/ student	2 m
Facemask	Compulsory from 6 years of age	At the Laender's discretion	Compulsory from 6 years of age	Compulsory	At the school's discretion
Additional precautions	Regular and sufficient air exchange	Forced or natural ventilation of classrooms	Temperature measurement at the beginning of the day	15 min ventilation every 2 h	Forced or natural ventilation of classrooms
	Natural ventilation of classrooms	Installation of mobile air purifiers	Frequent ventilation	Temperature measurement	Regular room sanitization
	Flexible forms of face-to-face teaching	Fast antigenic tests 2 times per week	Groups of stable cohabitation for kindergarten and primary education		Division of classes by halving the number of pupils
	Sanitization in the presence of an overt case	Formation of stable groups of 15 pupils	Setting up of the responsible for the management of COVID		
	Frequent hand hygiene	Frequent hand hygiene	Hand hygiene at least 5 times a day		

of education. Certainly, during the first wave, digital teaching methods were widely used, resulting in the closure of school facilities, causing both organisational-didactic problems (school staff were not adequately prepared for this eventuality) and access to education (Web-5). On the basis of this evidence, considering that digital teaching methods are more effective for children with greater learning autonomy and that the risk of infection transmission is very low among younger children, European countries were more cautious about closing schools as a result of the second wave (Van Der Graaf et al. 2021). Together with the use of face masks, interpersonal distancing and distance teaching methods, sanitising environments has been one of the simplest and most widely used interventions since the epidemic began. However, it is now believed that there is a greater possibility of transmitting the virus via the air rather than through contact with infected surfaces (WHO 2021), so it is appropriate to focus attention on aspects relating to the quality of indoor air and its sanitation, ensuring the correct and sufficient ventilation of environments. In parallel with maintaining healthy indoor air, it is appropriate to focus on the behavioural practices of users of school facilities and the internal organisation of these buildings. For these reasons, the following section will present considerations on design approaches concerning the retrofitting of existing school facilities or the design of new buildings.

8.3 Design Criteria for Rethinking School Environments

The normative and scientific evidence reported represents the starting point for the definition of design criteria that are useful both in terms of rethinking/adaptation of existing school structures, but also in the design of new buildings, in the light of the upheavals caused by the pandemic. Specifically, this study proposes solutions that can be adopted quickly to respond promptly to unforeseen and unpredictable situations. It is clear that the design of specific interventions can only be carried out with reference to a concrete practical case. Consequently, design parameters will be proposed which are not related to the distributive-functional characteristics or to the specific architectural character of a reference building. This hypothesis stems from the awareness of the wide variability of the design variables in function of the adaptive tendency found in each school building, of the level or grade of education, but also of the specific course of study (especially with reference to higher education institutes). For this reason it was considered appropriate to base the action protocol on the three components, in our opinion, essential to the performance of school functions in continuity, in accordance with the scientific references in the sector of interest.

As shown in Fig. 8.1, three areas of application have been identified: behavioural, adaptive and systemic, with the aim of acting simultaneously on user behaviour, on the adaptability of existing learning spaces and on the identification of technological systems suitable for the purpose.

Firstly, the need to act on good practices implemented by school users is highlighted. In addition to recommending the constant sanitation of environments,

Fig. 8.1 Fields of research and application (*source* authors)

temperature measurement at the entrance to schools, hand hygiene several times a day, the possibility of carrying out quick antigenic tests on a random basis, the implementation of public transport services to reduce overcrowding and many other behavioural or logistical measures, it is possible to adopt action protocols that provide for the decentralisation of teaching activities in emergency cases, allowing them to be allocated to ad hoc structures. This is the case of the Metropolitan City of Bologna, which organised classroom teaching for 1600 students from three higher education institutes in Hall 34 of the Bologna Exhibition Centre, with 75 classrooms (Web-6) made of prefabricated soundproofing panels and arranged along three main axes to simulate a miniature city. The particular aspect to be emphasised is the organisation of the spaces, both inside and outside, which makes it possible to avoid problems related to overcrowding by channelling incoming and outgoing flows through the numerous accesses available and the diversification of the routes. This solution could be applied in Italian schools equipped with gymnasiums or outdoor spaces that can be converted into educational functions with the use of modular structures. In fact, referring to the Italian case, it is possible to state that 38.8% of school buildings are equipped with gyms (Fondazione Giovanni Agnelli 2019) that can be adapted to these functions, if necessary. In the event that school facilities are not equipped with indoor or outdoor spaces to be adapted in case of emergency, it is possible to resort to optimising the equipment available, perhaps by increasing the number of accesses/exits, diversifying routes or, alternatively, identifying routes with a single direction of travel, staggering entry/exit times, using alternative accesses, providing adequate road signs, and barring entrances to infected persons. On the basis of these indications, it is evident that, in relation to the behavioural parameter, many practices have already been implemented. However, it should be emphasised that behavioural aspects represent a category that is difficult to control, since it is necessary to rely on the discretion and personal sensitivity of each user.

Adaptive actions, on the other hand, by affecting the distributive-functional characteristics of school buildings, represent a more controllable design component. These aspects are intrinsically linked to the seating arrangements and school furniture that closely influence the cognitive processes of the users (Tobia et al. 2020). The use of flexible and adaptable furniture, the use of single or double desks, the reconfiguration of the setting of classrooms to meet the needs of teaching activities, and seats that can be dismantled and assembled represent issues that have now taken a back seat to the pandemic emergency. On the basis of the evidence that emerged from the ratification of the spacing indications provided by European countries (Table 8.2), an areal parameter was introduced, in compliance with national regulations, from

which it could be possible to implement a 'new' sizing of classrooms, in light of the limitations imposed by the pandemic. Therefore, 4.00 m^2/student can be considered, so as to have a distance between the mouths of the students sitting at the desks of about 2.00 m (depending on the study stations used: single or double). It is clear that this 'minimum requirement' is a suitably achievable parameter in the design of new school facilities. However, in relation to the refurbishment of existing facilities it is more complex to interface with the dimensions of available classrooms. In order to intervene in schools, it is appropriate to question the propensity for adaptability and flexibility of spaces. Since the needs highlighted by the pandemic highlight the demand for independence of the functional areas of schools, it is necessary to intervene through adaptability and reorganisation criteria. The reception, connection and transit areas, the entrances, the atrium and the administrative blocks, the canteen, the library, the areas strictly intended for sports or social activities, the laboratories, the areas for practical activities, although they are indispensable spaces for carrying out teaching activities, due to the current contingent phase, need independence of function and use. The compartmentalisation of these spaces and the possibility of reorganising them requires measures to be implemented directly in the design phase of these spaces. The idea could be to adopt sliding, modular, closable and soundproof partition walls that would guarantee the adaptability of the spaces not only to the needs of spacing, but also to meet the new teaching requirements. Undoubtedly, open-plan spaces such as gyms are more suitable for this type of intervention.

The systemic scope, on the other hand, embraces the technological components of school buildings that contribute to the maintenance of good health conditions, also containing the spread of COVID-19 contagion. The healthiness of indoor air can be related to the monitoring of CO_2 concentrations between indoor and outdoor—I/O—(Schell et al. 1998; Schibuola et al. 2021). This data provides information on Air Changes per Hour (ACH), which is essential for the IAQ (Indoor Air Quality) not only in relation to ordinary conditions, but also in emergency situations, such as the current one. In this regard, Schibuola and Tambani (2021) recommend the use of autonomous high efficiency air handing units (HEAHU) to be installed inside existing classrooms and subjected to natural ventilation conditions, favouring the reduction of the R0 contagion index (currently considered by the health authority as a reference index to ensure the regular performance of activities in public buildings) and the lowering of energy consumption to 70%. The movement of air flows and its consequent exchange is a necessary, but not sufficient condition for the use of indoor public spaces. In order to further improve indoor air conditions it would be advisable to set up active systems, which can be integrated into existing buildings if necessary, that allow for the differentiation of incoming and outgoing air flows. In order to reduce the uncontrolled dispersion of pathogens, it is useful to adequately direct the air flows inside the school environment: a simple and effective solution consists of providing inlet vents positioned in the lower part of the classroom and extraction vents in the upper part. This configuration allows the formation of an upward air flow that eliminates air stagnation and decreases the concentration of pathogens, especially at the height of the mouths of seated students.

8.4 Conclusions

Although this research is in constant evolution, linked to the constant developments of the pandemic framework and the updates of the regulatory one, it was possible to make initial considerations on the intervention strategies implemented in some European countries to mitigate the risk of contagion in school facilities. The strategies identified fall into three areas of action: organisational, technological and spatial-functional, and refer both to the adaptation of existing school structures and to the definition of parameters to be taken into account when designing new buildings. Differentiating the action programme on the three levels—behavioural, adaptive and systemic—makes it possible to act contextually and synergistically on the aspects that mainly concern teaching and the correct use of school environments. The next steps of the research foresee the specialisation of the standard indices according to the different destination of the school environments, the degree or level of education, the adaptability of the school structures that can be analysed.

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Chapter 9
An Inclusive Response to COVID-19: Transforming Learning Environments

Fjolla Ibraimi and Nuran Saliu

Abstract Covid-19 restrictions have upended normal life flow, completely changed education systems, affected our mental health and social relationships. Educational institutions all around the world had to switch to remote and hybrid learning; many students abandoned their learning environments and had to learn from home. As expected, the crisis showed that distance learning isn't for everyone, children need guidance from a teacher and shared activities with classmates, for a fruitful learning process. As the world is slowly adapting to life in a pandemic, policymakers and educators in North Macedonia, were challenged to reopen schools or offer an appropriate online learning model. Beyond much discussion about where learning will take place, another question appeared: How to improve and reinvent schools to fulfill the needs of all students now and in the future? Besides causing difficulties, the global health pandemic delivered a clear picture of what works and what doesn't for pupils. It opened our eyes to existing inequalities and all challenges that need to be addressed. As new approaches to designing learning environments are required, we cannot return to the world as it was before. School designs with a renewed focus on the physical, mental, and emotional well-being of children constructed over the pillars of access, equity, and inclusion, are the future of a reformed teaching system. The built environment should ensure the safety of students, educators and staff, and act to the improvement of education and children's well-being in a (post) pandemic world. It is imperative that schools present a positive inclusive environment where children can explore and learn while feeling safe, equal and accepted. In the process of providing guidelines and suggestions for redesign or reuse of educational facilities, first and foremost one must begin with the evaluation of existing school infrastructure. Based on building codes and regulations, direct observation of 12 schools in Macedonia, and analysis of disabled user's needs, this research focuses on rethinking how buildings are designed, how architecture can reshape spaces and user experience, ending

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up with design guidelines and suggestions about how the classroom of the future should look like.

Keywords Covid-19 · Education · Inclusion · Safety · Learning environments · Design

9.1 Introduction

Education is a right that belongs to all children, regardless of their gender, disability, poverty, ethnicity, or language. Even with legal frameworks and human rights activists trying to fight injustices and raise awareness of the advantages of inclusion, education systems across the world are far from enabling an effective education and equal opportunities for all children (Stubbs 2008).

North Macedonia, taking after other countries, is determined to strengthen social inclusion by providing better educational opportunities for children with disabilities and is integrating these children into the regular education system (Stankovska and Memedi 2020). However, due prejudice, absence of coordinated legal regulations, poor management with accessibility and assistive technology, and a lack of understanding about disability and inclusion, children and youth with disabilities in North Macedonia experience significant barriers to learning (Hunt 2020).

While difficulties in the learning process have been constant issues, the pandemic emphasized systemic inequalities, resulting in the further exclusion of children with disabilities. Many studies point out that even the little progress that had been made toward inclusive education now has been endangered by the COVID-19 situation (Beaujolais et al. 2020).

Since in these circumstances, it is more than clear that the educational system but also the school facilities themselves need changes, and the difficulties faced by students are more highlighted, the opportunity to learn from this situation presents itself; to understand what future education reforms must include, and present new ideas for inclusive education and solutions for all the crises (such as COVID-19) that await us in the future.

This research consists of a series of actions or steps; from understanding the impact of the COVID-19 pandemic on education (while discussing school closures and inequalities in access to education in the country) to continuing with an evaluation of primary school environments in RNM, in terms of accessibility and inclusion (recognizing the current status of primary schools and the barriers in accessing education), ending with the guidelines that need to be followed for these premises to be transformed into inclusive environments.

9.2 Learning During Physical School Closures

The closure of educational institutions, as one of the preventive measures against Covid-19, affected the lives of many learners, more than 1.6 billion, according to UNESCO. Since learning in physical environments was not possible, most countries tried to solve this problem by switching to online learning. The effectiveness and usefulness of this process were an important topic for many researchers in the field of education, social life and mental health (Chaturvedi et al. 2021).

Considering that the pandemic seemed to have no end, North Macedonia, as well, made a fast transition from face-to-face classes to distance learning. The development and planning of online classes were entrusted to individual schools, sometimes even teachers, who due to their level of knowledge and skills for the use of technology, had great difficulties managing the situation. By trying to avoid learning losses, unequal learning opportunities for children from low-income families and children with disabilities were created (Petrevski et al. 2021).

Beyond the attempts of teachers and schools for positive outcomes, online learning developed with many problems and disadvantages and most importantly affected the level of learning (Fig. 9.1). Even before COVID-19, schoolchildren in North Macedonia have observed inequalities in education. Understanding the difficulties they faced during the pandemic, from the impact on the learning process to the well-being of students is a helping hand in supporting their access to education (Petrevski et al. 2021).

During this period, many studies researched issues faced by school, teachers and pupils with regard to access to education. Problems with the sharing of equipment, internet connectivity issues, and lack of computers were among the difficulties

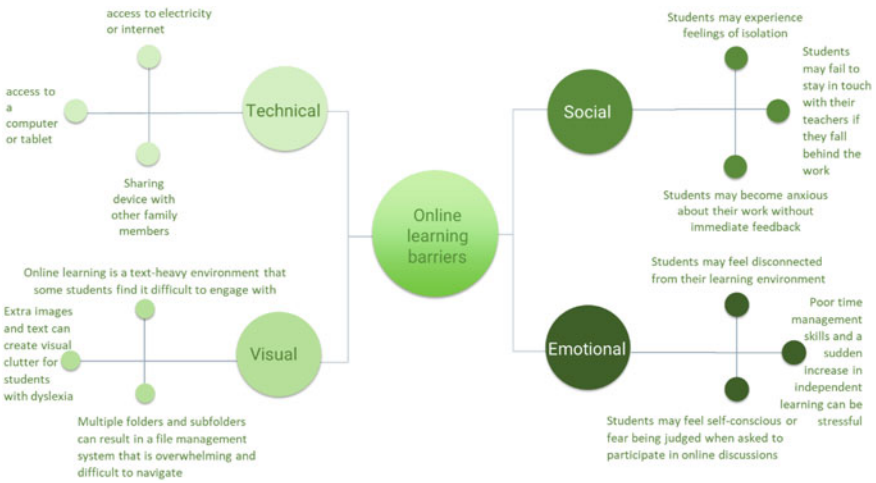

Fig. 9.1 Online learning barriers to inclusion (adapted from: studyseed.co.uk 2020)

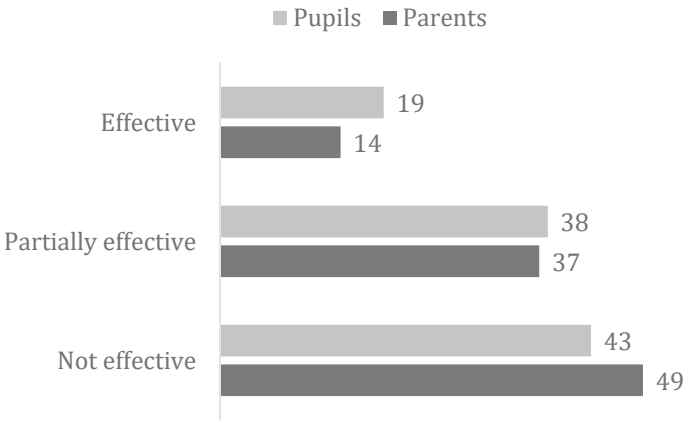

Fig. 9.2 Appraisal of the effectiveness of distance learning (*source* UNICEF 2021)

that were reported the most, especially among Roma pupils and pupils from low-income families. Lack of assistive technology was a serious problem for pupils with a disability. Children were not satisfied with the results of online learning, they claimed that class interaction inspires them to collaborate, work harder and socialize, which is hardly possible in an online class (Chaturvedi et al. 2021). Parents, as well, evaluated distance learning not effective or partially effective (Fig. 9.2) (Petrevski et al. 2021).

While many schools provided lessons to help children's learning at home, they didn't incorporate the needs of vulnerable groups, as children with disabilities. These children were neglected when planning emergency education policies, which has resulted in a number of negative effects on their learning process. The situation with COVID-19 highlighted many problems that come with distance learning for children with special needs; the lack of accessible technology, their need for emotional support, and the unpreparedness of their parents for home-schooling. The 2020 academic school year, was a good reflection of the prejudicial treatment of these children in education, and there were important lessons to draw from this situation. COVID-19 reminded us of the importance of incorporating disability needs when designing the education policy for emergency responses (Jia and Sani 2021).

The problem lies in the fact that, not only during the pandemic but also during the normal development of studies, the needs of children with disabilities are often overlooked. And after this crisis situation is over, and the children can return to school, will they return to a learning environment that will help the educational process or to an environment that, thanks to its physical characteristics, will be one more obstacle in their development and education.

To get a clearer picture of what a welcoming and accessible learning environment should look like, the following chapter of this paper focuses on the principles of designing environments that include everyone.

9.3 Including Everyone-Accessibility and Universal Design

A society that aims to provide all children with equal conditions for education and equal opportunities for professional and personal fulfillment, must start by creating flexible learning environments that increase access and encourage the participation of all, in particular its most vulnerable populations, like students with physical and sensory disabilities (Carabajal et al. 2017).

When designing school facilities, accessibility should always be given importance. As Yilmaz (2018) states: "Everybody must use the built environment independently and equally." The school environment, whether in the interior or exterior, must support children with special needs in the process of their physical, sensory and cognitive development (Degenhardt and Schroeder 2016).

Ensuring the accessibility of the physical environments goes beyond building access ramps, it is about facilitating movements within the whole chain of events from the way to school, movement within the building, access to the classroom, to the canteen, multifunctional hall, or sanitary facilities, to playing and evacuating the school in case of emergency (Fig. 9.3). As with all chains, one missing link cancels the benefits of all the others, in order to make access possible the chain must be complete (Plantier-Royon 2009; Topping 2014).

9.3.1 Getting to School

The road from home to school is an adventure in itself for young children. During this journey, they may encounter obstacles, such as high traffic, rapid movement of vehicles, and lack of sidewalks and road signs. When a child has special needs and encounters any of the above-mentioned obstacles, the journey to school becomes much more difficult. For this reason, routes leading to the school must be safe for all children, away from traffic, and well maintained (Topping 2014). Particular attention should be paid to audio, visual and tactile signals, to help guide children with disabilities and at the same time protect them from traffic hazards (Hawkins et al. 2014).

Fig. 9.3 The accessibility continuum (*source* UNICEF 2014)

9.3.2 Entering the School

The purpose of inclusion is that children with special needs feel equal to their peers and in the school environment this equality should be evident from the entrance to the school. If these children cannot use the same entrance as others, they will be psychologically affected and end up feeling different and unequal. To avoid this happening, the entrances should be wide, easy to operate, easily identified, and free of steps (Topping 2014).

9.3.3 Moving Through the School

Horizontal and vertical movement affects the accessibility of the whole building. If the corridors are not wide enough to allow two people in wheelchairs to pass by, or there are changes in levels that impede their movement then accessibility is automatically lost. For people with visual impairments paths of travel should be free of wall-mounted objects (Topping 2014). Since there are people with mobility difficulties, the distances between the main activities should preferably be as short as possible. Besides corridors, the means for vertical movement such as stairs, elevators and ramps should be planned in detail (Abouelsaad and Shafik 2017). Tactile patterns at the top and the bottom of each flight of stairs are a prerequisite for the safety of pupils with visual impairments. Handrails on each side of the steps provide support for children with restricted mobility (Bright 2017) .The ramps should also be wide, at least 1.2 m, not too steep, but as practical as possible, and have enough space for movement and rotation at the beginning and end of the ramp (ISO 2011). A choice of routes should be provided where changes in level appear (Mistrey 2011).

9.3.4 Entering and Using Classrooms, and Other Spaces

The design of classroom doors affects not only students' access but also the evacuation process and their safety, so, doors must be designed according to standards. The shape and dimensions of the classrooms should allow different activities, free movement, and participation in activities for all children, regardless of their disability or impairment (Topping 2014).

For children with autism, due to problems with sensory perception, it is preferable to have several types of larger and smaller spaces (Leestma 2015). Evacuation in case of emergency can occur without problems if the design of learning environments allows their use without assistance. Visually clear structure in the classroom, adequate wheelchair storage, and circulation/turning spaces are some strategies that help in this regard (Bucholz and Sheffler 2009).

Disabled children need adequate furniture and equipment so that they are not limited to participating in all activities that take place in the classroom. The shape of the furniture, dimensions, height of the work surfaces, treatment of the corners, and materials used should all be planned according to the needs of their user (Hawkins et al. 2014). The whiteboard's framing cannot be white or the color of the wall and chalk or markers used must have a strong contrast with the board, for pupils with visual impairments and perception difficulties (Topping 2014).

9.3.5 Water, Sanitation, and Hygiene (WASH) Facilities

All children need accessible, usable and functional WASH facilities. At the minimum one of these facilities must be equipped with helpers, grab rails and hosts, and have enough large space for entrance, circulation and turning of a wheelchair (Abouelsaad and Shafik 2017). Unisex accessible toilets are preferable as they allow more flexibility for people who require assistance (Hawkins et al. 2014).

9.3.6 Playing

We all know the positive effect that nature has on the development of children, through various games they not only learn a lot about the environment around them but can also have fun and relax (Wilson 2008). So, it is important to provide accessible outdoor environments, that can be used by children with restricted mobility, children with visual or hearing impairments, autistic individuals, etc. Wide pathways, accessible ramps, inclusive equipment, and sensory materials must be considered in play areas (Topping 2014).

9.3.7 Evacuating the School in an Emergency

Emergency escape procedures, especially for children with SEN and disability, may be particularly challenging. Therefore, personal evacuation plans should be planned for each child with disabilities (Topping 2014). For all children to be evacuated fast and safely, elevators must be very large, and all exterior doors should be easy to use or automatic (preferably sliding). A mix of voice alarm systems, visual alarms, and vibrating paging systems is of great importance for the hearing impaired, visually impaired, and other disabled people (Hawkins et al. 2014).

9.4 Inclusive Education in North Macedonia

North Macedonia plans to acknowledge existing gaps in education and address inequalities by reforming the education system. In "The Education Strategy of the Republic of Macedonia and its Action Plan" inclusion of primary schools is envisaged as one of the key points to enable equal rights for all children. A number of projects, some supported by foreign humanitarian organizations, have been undertaken to support the inclusion process in primary education (Stankovska and Memedi 2020).

In previous research, with reference to the inclusion of children with disabilities in regular education in our country, there was an attempt to address the level of accessibility in some of the schools in Tetovo, Gostivar, Skopje, Kichevo, and Struga, by using different research methods like observations, interviews and surveys of administrative, educational staff, children, and parents of children (Ibraimi 2021).

As illustrated in Table 9.1, the study of the current state of the schools' accessibility was based on the design principles of Topping (2014); the table is formulated with some questions that assisted in the evaluation of positive and negative aspects of the current state of schools. Observations of the condition of roads and sidewalks helped to understand the difficulties children encounter on their way to school, analysis of the type of surfaces used, the size of the doors and the presence of ramps and stairs, assisted in the identification of opportunities for entrance and movement. Questions related to the positioning of classrooms, WASH facilities and other spaces, their size, used furniture, and opportunities for emergency evacuation were also part of the survey. The positive data extracted from this research was that, in all schools, classroom doors were wide enough for the access of children with limited mobility, desks and other furniture could be moved and organized in different ways to adapt to the curriculum, as well as the number of students in the classroom allowed unimpeded evacuation in emergencies (Ibraimi 2021).

Considering the width of the corridors the movement in the school could develop freely, and identification of WASH facilities was clear thanks to the signs used, but these facilities in 9 of the schools were not suitable for use by people with disabilities. While children had no problem entering the classroom, the same cannot be said for entering school. In none of the cases studied the entry was free of steps, which means that the presence of entrance ramps is necessary, but observations show that 5 schools lacked entrance ramps so the entrance of students with disabilities became impossible without assistance. The process of getting to school also turned out to be very difficult, starting with inadequate materials used for roads and sidewalks, their maintenance, traffic safety, and the lack of audio and visual signals to help orient children with visual impairments, etc. (Ibraimi 2021).

According to the data collected, the results are far from satisfying. Every part of the accessibility continuum from getting to school to evacuation must be carefully handled and all options for improvement should be considered for these schools to be transformed into inclusive environments.

Table 9.1 Implementation of accessibility continuum design requirements

Schools design requirements	01	02	03	04	05	06	07	08	09	10	11	12
Are the routes used to reach the school well-maintained and free of obstacles?	√	√/ X	√	√	√/ X	√	√	√/ X	√	√	√	√
Are sidewalks or designated pathways provided along the entire route?	√/ X	√	√	√/ X	√	√	√	√/ X	√	√	√/ X	√
Is the ground surface at the entrance and within the school area firm, even, level and well maintained?	√	√	√	√/ X	√	√	√/ X	√/ X	√	√	X	√
Is there space for a sitting area with overhead protection that is connected to a wheelchair-accessible route?	X	X	√	X	X	√	X	X	X	√	X	X
Are paths to play areas wide enough to allow a child using a wheelchair to pass another child or adult?	√	√	√	√/ X	√/ X	√	√/ X	√/ X	√	√	√/ X	√
Are both visual and audio alarms provided?	√	X	V	√/ X	X	√	√/ X	X	√/ X	√/ X	X	X
Is the main entrance free of steps?	√	X	X	X	X		X	√	X	X	X	X
Is a ramp provided where there are changes in floor levels/ heights?	√	√	√	X	√	√	X	√	√	√	√	X
Are WASH facilities identified with signage that is clearly visible?	√	√	√	√	√	√	√	√	√	√	√	√
Are the hallways wide enough to allow a child using a wheelchair to pass another child or adult?	√	√	√	√/ X	√	√	√	√	√	√	√	√
Are doors wide enough to allow a student using a wheelchair to enter?	√	√	√	√	√	√	√	√	√	√	√	√
Can classroom desks and tables in classrooms be moved if needed?	√	√	√	√	√	√	√	√	√	√	√	√
Classrooms are not overcrowded and children are able to leave quickly?	√	√	√	√	√	√	√	√	√	√	√	√
Do some classroom desks and tables have knee-space clearance for children who use wheelchairs?	√	X	√	X	X	√	X	√	√/ X	√/ X	X	X

(continued)

Table 9.1 (continued)

Schools design requirements	01	02	03	04	05	06	07	08	09	10	11	12
Have signs been provided to identify rooms and amenities?	√/X	√/X	√	√/X	√/X	V	√/X	√/X	√/X	√	√/X	√
Do signs have color contrast and text provided in larger-sized fonts?	√	√/X	√	√/X	√/X	√	√	√	√/X	√/X	√/X	√/X
Are handrails provided?	√	√	√	√	√	√	√	√	√	√	√	√
Vertical circulation includes ramps and lifts, suitable for people with disabilities	X	X	X	X	X	X	X	X	√	X	X	X
Are accessible toilets integrated with regular toilets?	X	√	√	X	X	√	√	√	√/X	X	X	√

Since elaborating instructions for each of the links in the above-mentioned chain is a long and complex process that cannot be included within a paper, seemed necessary to address only one link of the accessibility continuum in this research, while other elements are expected to be treated in future papers until a complete transformation of these school buildings is achieved.

9.5 Transforming Learning Environments

The need for the transformation of learning spaces emerged with the advent of COVID-19, and especially when some of the children started going back to school. In North Macedonia, according to the plans for the safety of pupils and staff, a minimum of 1.5 m distance between pupils was required in classrooms, which resulted in the change of classroom arrangement, reduction of the number of pupils in the classroom, and a series of other changes. So, since change is inalienable, why not take into account the needs for accessibility and equity during these transformations and thus have an inclusive response as a solution to the problem we face.

Being aware of the problems that exist in our schools as well as having access to many guidelines that help design inclusive spaces, why not improve school facilities to meet the needs of children with disabilities? According to Topping (2014), "Integrating accessibility into the design of schools is usually viewed as being very expensive, adding significantly to the construction cost.", and this often turns out to be one of the main reasons hindering school improvement. However, even without making major interventions to existing infrastructure, it is possible to provide greater accessibility in the school environment for students to move freely, learn, and participate in activities beside their peers.

Concerning this statement, came across the idea to find an optimal solution within the boundaries of the existing learning environments, by using only facilities that

were available, reducing the number of pupils in the classroom, and trying different layouts and furniture arrangements.

Figure 9.4 presents three of the most common samples of classrooms found in the analyzed school buildings. The first row illustrates their current state, while the second row illustrates optimal solutions that were derived from social distance requirements set by COVID-19 and standards for movement without barriers. For respecting these objectives, the solution to the first example relies on a screen device (furnishing) to separate the paired students from one another, while in the following examples, the classroom layout is based on a 1.5 × 1.5 m grid, and the seats are positioned in the intersection points.

Diagrams demonstrate that, when applying social distancing metrics, classrooms are limited to about half the number of students that would typically be accommodated, which increases the planning value of m^2 per pupil and enables solutions for a more accessible environment. Children who use wheelchair or sticks can move and navigate easily within the classroom, they have access to different seating positions, access to teacher's desk, blackboard, are able to make use of cabinets, etc.

However, these solutions are only helpful for children with mobility impairments, if a school has a high proportion of children with SEN and disabilities, which is reasonable for inclusive schools, additional provision is needed to design a fully inclusive classroom that caters to children with sensory, social, emotional, and health difficulties (Fig. 9.5).

Whether planning a new school or renovating an old one, besides classroom size and layout, designers must be careful in the use of color, light, texture and audio

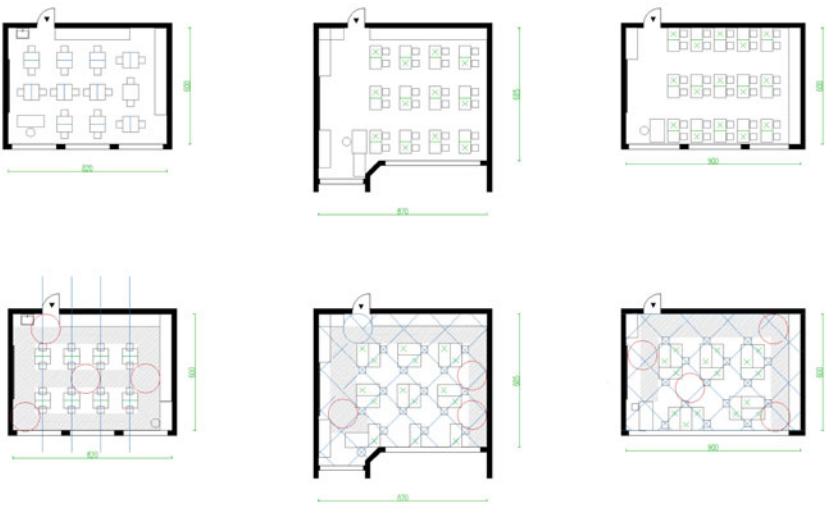

Fig. 9.4 Classrooms in existing school buildings versus potential solutions (*source* the author)

Fig. 9.5 Inclusive classroom components (*source* the author)

elements, to meet the different architectural and sensory needs of all pupils. Lighting and acoustics affect not only the development of the learning process but also the movement and orientation of students.

Abouelsaad and Shafik (2017) emphasize that even beyond the attempts for an accessible design, often the school building cannot meet the needs of all children, as there are cases when their requirements may be in conflict with each other, but the best option is to offer solutions that are flexible and enable adjustments when needed, provide choices and constant control (Abouelsaad and Shafik 2017).

We must seize every opportunity given to us for inclusion, as schools that are accessible and usable by every child, are an ideal example of how a well-designed environment can influence the development and the learning process.

9.6 Conclusion

The consequences that Covid 19, in particular the closure of schools, had on the education system are abundantly clear. Academic learning loses, deterioration of the emotional and psychological state of pupils, bolder discrimination and isolation of children with special needs, are some of the negative impacts that the pandemic had

on our lives. Teachers, parents, and even pupils themselves are aware that distance learning was not effective.

Since children with special needs have been neglected constantly, now is the time to take action to help their education. To accommodate the needs of children with disabilities an interconnected system of design requirements must be completed. It is extremely difficult to find a model to meet the requirements of all pupils, as sometimes their requirements may conflict with each other. Distinguishing existing barriers and finding realistic solutions according to everyone's needs is a challenge many designers are currently facing. Based on observations carried out, institutions in North Macedonia are not adequate for the practice of inclusive education. Whatever the cost of incorporating accessibility into existing schools is, it could not be more valuable than the right of children with special needs to learn together with their peers. As architects, we have a responsibility to design learning environments that are hospitable to all and effectively stimulate the development of children with disabilities.

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Chapter 10
Study of a Mobile Medical Testing Unit in the Context of a Historic Urban Area

Enrico Pietrogrande and Alessandro Dalla Caneva

Abstract The authors studied the design of a prototype for a mobile medical testing unit in a specific historic urban context. The initiative was a response to a request made by the University of Padua to its professors and technicians for the generation of ideas suitable for combating the Covid-19 pandemic during the worst period of this medical emergency. The medical testing unit, designed for a wider context, was initially studied for the purpose of providing medical tests and check-ups for the University of Padua student population and the personnel employed by the university. It is appropriate for use in the virtual city composed of the numerous sites where University of Padua activity is articulated, facilitating medical check-ups, and anticipating and fighting epidemiological phenomena where they are found. In terms of reassuring the students and their families, the results can be significant. The project was themed on the basic module being flexible so as to facilitate the use of space for new needs resulting from a health crisis and to respond to an evolving crisis situation and the consequent need for functional adaptation. The medical testing unit also constitutes a sign that the University of Padua is present in the territory: the finishing of the cladding panels was studied in order to express the identifying elements and publicity referring to the university itself. The medical testing unit, which can be deployed in the piazzas of larger towns as well as in small villages, is able to move medical personnel and units in loco from the traditional institutional sites while at the same time relaunching the concept of the presence of the university in the territory.

Keywords Medical testing unit · Medical tests and check-ups · Pandemic event · Historic urban context

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10.1 Introduction

The Covid-19 virus was recorded for the first time in Italy on the 31 January 2020. The diffusion of the epidemic was immediately different in each of Italy's eighteen regions. The rates were high in northern regions, intermediate in central ones, and lower in the South.

During the first period of the emergency, the University of Padua requested its professors and technicians to generate ideas suitable for contrasting the Covid-19 pandemic. The University of Padua asked the teaching staff to read the phenomenon of Covid-19 from the point of view of an interdisciplinary logic able to marry different languages, skills, and knowledge together. As a response to the request, the authors of this presentation studied the design of a prototype for a mobile medical testing unit, specifically thought for historic urban context.

The mobile medical testing unit presented below was designed as a preventive instrument which constitutes a specific public place to carry out the Covid-19 medical check-ups. Its specifications were to be temporary in its definition of a determined public space, and to be mobile so that it could be moved according to a pre-planned medical programme. It is appropriate for use in the virtual city composed of the numerous sites where University of Padua activity is articulated, facilitating medical check-ups, and anticipating and fighting epidemiological phenomena where they are found. In terms of reassuring the students and their families, the results can be significant.

The project was founded on a flexible basic module to facilitate the use of space for new needs resulting from a health crisis and to respond to an evolving crisis situation and the consequent need for functional adaptation. The functional specification constitutes the starting point for the development of the project, but it does not constitute the formal solution, which depends on the way the public perceives the appearance and form of the general idea of the pavilion.

The idea of the mobile medical testing unit reflects formal needs identified as being essential, such as the basement and the autonomous volume set on and supported by the basement. An example of this is the design and layout of the National Gallery developed by Mies van der Rohe in Berlin (Carter 1999).

Components in the formal solution of the mobile medical testing unit also meet the need to constitute a formal element able in its repetition and combination to define urban places possessing a spatial quality.

10.2 Components of the Mobile Medical Testing Unit

The components of the mobile medical testing unit are the following: basement, autonomous volume, cladding, and structural septum. The civil or public value is brought about by the superelevation of the medical space on a basement. It is

composed of a platform with steps characterised by a wooden load-bearing construction covered by wooden panels. The metal panel adaptors on which the mobile medical testing unit sits are hidden under the wooden floor (Fig. 10.1).

The space is defined by starting from a square-shaped module (Fig. 10.2) whose repetition means there is some flexibility in deciding the size of the mobile medical testing unit depending on the specific needs it has to meet. The modular flexibility means the space can be implemented to face the new needs the medical emergency may require as the situation evolves, and so new functional adaptations are needed.

The 2.20 × 2.20 m base module pattern is defined by a steel structure according to a beam-column design. The vertical development may vary, allowing a maximum height of 2.75 m (Fig. 10.3). The medical space is crowned by a galvanised steel

Fig. 10.1 Insertion of the mobile medical testing unit in the urban context. Rendering: Padova, Capitaniato square, Faculty of Arts and Humanities

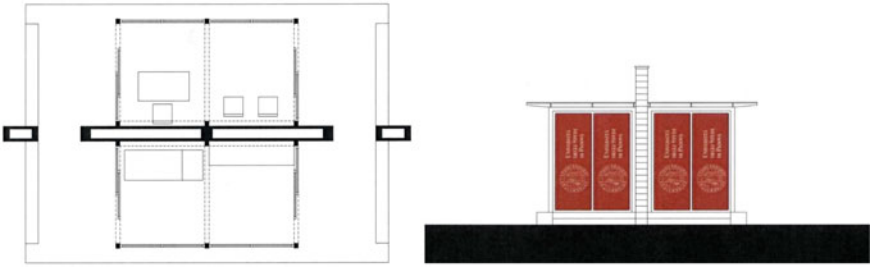

Fig. 10.2 Mobile medical testing unit, pavilion type 1. Plan and façade showing the twin entrances or exits (*Source* Authors)

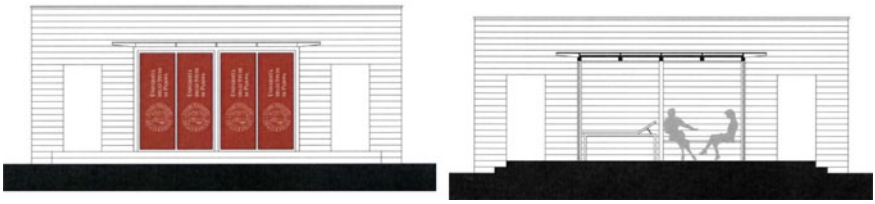

Fig. 10.3 Mobile medical testing unit, pavilion type 1. Façades and section alongside of the partition septum (*Source* Authors)

Fig. 10.4 Composition scheme of the façade of the pavilion type 1 (*Source* Authors)

covering supported by a system of metal beams. The problem of excessive sunlight is solved by making the covering overhang by half a metre (Fig. 10.4).

The trilithic metal structure represents the structural framework which has the cladding attached to it. The cladding is made of glass on the steel framework. The glass is only transparent when looking through it from the inside to the outside and serve to connect the inside with the external environment avoiding people suffering claustrophobia inside the mobile medical testing unit. The entire surface of the glass panels has been treated so that the logo and general identification of the University of Padua can be placed on them.

The structural septum is a cable partition acting as a duct composed of a load-bearing structure covered in wooden floorboard. On the one hand it serves as the technical compartment housing the plant and equipment, and on the other hand confers an urban role on the mobile medical testing unit. The partition is in fact the wall that defines the urban places through its arrangement (Fig. 10.5).

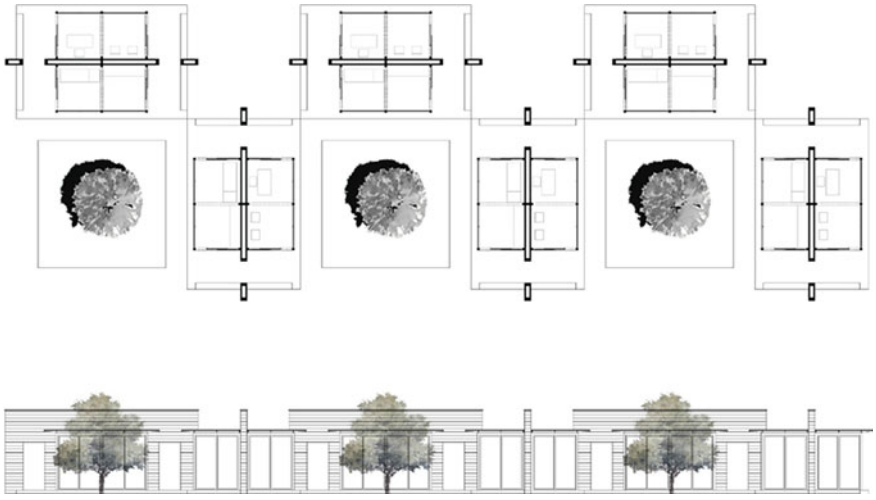

Fig. 10.5 Spatial compositions based on the juxtaposition of the basic type 1 pavilion (*Source* Authors)

10.3 Functional Walkways and Organisation

The basic type 1 mobile medical testing unit has space for Covid-19 medical testing articulated in two completely autonomous environments separated by the septum/wall inside which the plant and equipment required are housed. The two environments have parallel entrances on one of the sides orthogonal to the septum, and exits on the opposite side at the end of a linear walkway. This reduces the physical meeting of people tested to a minimum and consequently the possibility of infection. The people make two queues a long way apart that converge towards the two distinct entrances, and they exit without coming near to those who are waiting. The doors are sliding ones, open automatically, and correspond in width to the size of the module, 1.10 m.

10.4 The Pavilion as a Planning Theme

The ambiguous nature of the pavilion as a typological theme was pointed out by Martina Landsberger (Gandolfi 2018). This ambiguity is born out of the semantic definition of the term pavilion. On the one hand, it means an idea of a place defined by the action of covering with a roof, and on the other it is an independent object, autonomous of any building.

The idea of pavilion presented here refers to the second definition more than the first for two reasons in particular. The first is strictly connected to the current theme of the Covid-19 pandemic. The pavilion is isolated as it is a metaphor for isolation, the social distance that people must keep between them. The second is due to its

urban character, that is, the isolated object can be removed and relocated to various points in the city and thereby establishes truly urban relationships, constructing set scenes in the life of mankind. So the pavilion becomes an instrument for constructing urban places endowed with aesthetic quality.

The history of architecture is full of architectures referring to the pavilion theme (Samson 2015). Without taking a historical view of pavilions in general, the authors propose the sources of inspiration for the emergency pavilion presented on this article.

The planning project has looked to several models such as the Temple of Jerusalem (Goldhill 2011), the Frederick the Great Monument, the pavilion of the Orianda Palace by Karl Friedrich Schinkel (Phillip 2000), the Walhalla by Leon von Klenze (Wöss 2016), the National Gallery by Mies van der Rohe and the De Blas house by Alberto Campo Baeza. These examples refer to different functions, but they all share the same idea. They are isolated, autonomous buildings placed on a podium to accentuate their presence in their natural or artificial context. Their form interacts with the context and constructs a place (Figs. 10.6, 10.7 and 10.8).

The emergency pavilion forming the subject of this paper therefore contains this idea because it is a small elevated autonomous volume raised on a base. The character of the base evokes the idea of elevation to distinguish the object, not to make it monumental. In fact, the monumentality belonging to sacred historical buildings

Fig. 10.6 Pavilion references from the history of architecture. Temple of Jerusalem, Monument to Frederick the Great in Berlin (Friedrich Gilly, 1796)

Fig. 10.7 Pavilion references from the history of architecture. Orianda Palace in the Crimea (left—Karl Friedrich Schinkel, 1938) and Walhalla Temple near Regensburg (right—Leo von Klenze, 1830–1842)

Fig. 10.8 Pavilion references from the history of architecture. National Gallery in Berlin (left—Mies van der Rohe, 1962–1968) and right De Blas House near Madrid (Alberto Campo Baeza, 2000)

now seems to be anachronistic. Fortunately, at the time of writing architecture does not aspire to eternity because eternity is a concept which we have no reason to occupy ourselves with.

10.5 Conclusions

The finishing of the cladding panels—glass on a metal framework, measuring 1.10 × 2.75 m and monodirectional in transparency from inside to outside (Fig. 10.9)—was designed to bring into view all of the identifying elements and publicity referring to the University of Padua.

The mobile medical testing unit, that can be placed both in the larger piazzas of important towns and in the smaller places of little villages, allows the transfer to the surrounding region from the traditional institutional locations of medical personnel and departments. In this way re-inventing the concept of the presence of the university teaching department into the territory.

The mobile medical testing unit can also be appropriately used in the virtual city composed of numerous locations in which teaching activity is articulated, permitting medical check-ups, anticipating and fighting epidemiological phenomena, involving the student population and personnel employed by the university, even if only

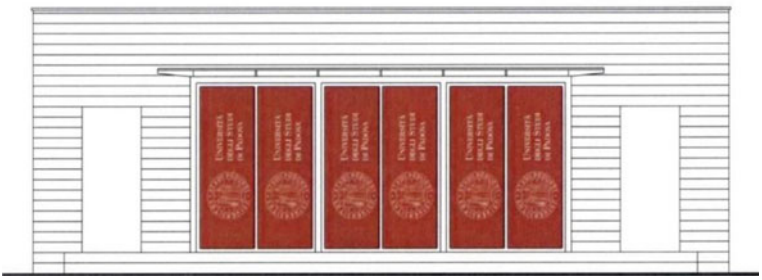

Fig. 10.9 Mobile medical testing unit, pavilion type 2, façade (*Source* Authors)

for study samples. Currently, the mobile medical testing unit could be used for vaccination operations.

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Chapter 11
Building Post-Covid Zero-Net Energy Shelters with Shipping Containers

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Abstract Almost 40% of all energy is consumed by buildings; therefore, there is a high demand for the construction of sustainable residential units with zero or low energy consumption. This study presents a proposal for a green building design for a touristic village located on the Ionian Sea coast. The project brings to Albania a new concept of building sustainable houses by reusing shipping containers. This design aims to build self-sufficient vacation houses that are ideally suited to an 'off-grid' rural setting and, at the same time, can be used as shelter in case of a pandemic. The energy is generated entirely by the solar panel system, which is placed on the roofs of houses. The project includes a water harvesting system that will provide the water for each house and also a gray water system collection, which can be used for gardening. Warm water is provided by a solar water heater. The project is based on the evaluation of the capacity of one shipping container to fit several living activity zones. Modular units are joined together in order to provide different housing typologies suitable for all types of families. The project utilizes the concept of the reuse of the shipping containers that can be found locally, the transportation of them by sea, and the conversion of them into prefabricated living cells that can be easily assembled on site. The autonomy of the house, the use of renewable energy, the recycling of wasted materials, and the speed of construction contribute to the resiliency of the housing design and make it suitable for application in emergency situations.

Keywords Shipping container · Modular design · Off-grid · Vacation house · Resilient house · Renewable energy · Sustainable design · Shelter

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11.1 Introduction

The growth of the population and global warming are becoming two of the most discussed topics nowadays (Barnard 2017). The population has been growing for years, but the problem is that it directly affects the density of large cities. The perfect example is Tirana, where pollution and noise are becoming unbearable, and everyone nowadays looks for a getaway to spend a weekend near the beach or on the mountain where nature is quiet, and the air is fresh. Global warming is affecting the entire world, but in Albania, only recently have people become aware of how important it is to build sustainable buildings. The COVID-19 pandemic is a recent global event that directly influences the everyday lives of people all over the world. It impacted everyone's lifestyle and showed that most spaces are not currently suitable for changing sanitary requirements.

The aim of this work is to promote ecological and sustainable houses and to demonstrate all the benefits of modular construction. Building one- and two-story-high houses from shipping containers and using other recycled materials helps reduce waste and the carbon footprint of the house. Building typologies are developed with the use of units that combine bedrooms, a kitchen, a living area, a dining area, and a bathroom. Some houses have an extra room that can be used as an office, a painting studio, or an activity room.

Shipping containers can be taken from Durrës Port. These containers have remained unused for years. This project helps them to discard these unused containers and put them to use by building ecological houses. The selected containers have modular dimensions of 12 or 6 m long, and different housing typologies can be assembled depending on the space offered on site by nature.

Over the decades, tourism has become one of the most important sectors in the world. The Mediterranean region, with its history and natural beauty, has become one of the most popular tourist destinations in the world. The Albanian Riviera is one of the most beautiful and picturesque regions of the country. With the development of infrastructure, beaches such as Palase, Jale, and Llaman were reached by tourists. Qeparo village is one of the oldest villages on the Riviera, and lately it has become one of the most visited by the locals and tourists.

11.2 The Concept of Sustainable Container House

Sustainable houses are houses that are environmentally friendly, energy efficient, comfortable and should use renewable energy, filtered rainwater, and recycled materials (Tuohy 2004). Sustainable houses have a different characteristic of construction that allows them to be assembled in a faster way. One of the aspects of a resilient community is the management and response to disasters, and design with modular prefabricated units can be a solution for event mitigation and recovery (Byrne 2019). For green architecture, reuse of shipping containers became one of the emerging

trends (Truman 2016). Container architecture is constantly developing and exploring new dimensions, such as residential construction, which includes everything from small single-family houses to multi-story structures with hundreds of containers stacked one over another; commercial facilities; small urban units, such as public toilets; office premises; museums; education facilities; and post-disaster emergency settlements (Shen et al. 2020). The dimensions of the standard shipping container are suitable to host any of the living activities, and within one container, several functional zones such as kitchen + dining, bedroom + bathroom, and living room can be combined. There is a lot of flexibility in the functional design of one unit, as well as multiple ways to combine modules (Elmokadem et al. 2019). Due to their wide availability, modularity, possibility of transportation, and fast construction, shipping containers can be used as resilient post-disaster shelters. The only social issue with such an application is the fact that not every family agrees to live in the shipping container (Zhang et al. 2014). Still, container buildings are ideal for temporary houses, such as vacation houses, where inhabitants select their own duration of stay.

There are 17 million shipping containers around the world, and 11 million of them are left unused in ports. They have standardized dimensions and a unified structural system that is designed to allow the containers to be stacked, one on top of another. The lifespan of one unit can last from 10 to 30 years (Radwan 2015). Shipping containers can be considered relatively inexpensive in comparison with usual construction materials. However, they are not produced in order to be used for architectural purposes, and the adaptation of one container may include the installation of windows and doors, thermal insulation, plumbing, and wiring works, which require some professional skills (Anagal and Dhongde 2017). The removal of the boundary panels or their replacement with windows results in the weakening of the entire container structure; therefore, there is a need for reinforcement (Grbowski and Kałdunek 2017). The interior design of the container house is not different from the conventional one, and the same finishing materials such as drywall, gypsum boards, hardwood or laminate flooring, and standard furniture can be used (Moore et al. 2015).

Construction of a sustainable zero-net-passive house on the base of shipping containers requires the same approaches as conventional ones, such as thermal insulation, the installation of photovoltaic panels, rainwater collection, and wastewater management. A study from Canada shows that the construction of a passive container house is 28% more expensive than the standard house due to the high cost of thermal insulation (Bowley and Mukhopadhyaya 2017). For the Mediterranean climate of Albania, with minimal insulation needs, this difference is reduced. A great contribution of the shipping containers to the environment is that they are going to be reclaimed and upcycled, which will reduce CO_2 emissions in comparison to the construction using traditional techniques (Madkour 2017). Zero-net energy building also includes several innovative technological solutions, starting with the energy control monitoring system, the photovoltaic panels' system, and the wind generator. An important addition is the solar water heater panels. All the house equipment and appliances need to have high energy efficiency. The US Department of Energy aims to

reduce residential energy consumption from 40 to 100%; however, it is agreed that it is not yet feasible to make every house zero-net (Hemsath et al. 2011). The difficulty in harvesting solar energy is that it is seasonal and depends on the climate of each particular place. But the goal of a zero-net sustainable vacation home at the Mediterranean cost is achievable since it is planned to be used during the summer with the maximum solar radiation available. Building elements, such as double-glazed windows, window shutters, eco-friendly thermal insulation, durable roof materials, and energy elements, such as solar heaters and photovoltaic panels, must be integrated in a way that combines simplicity of installation with the highest reduction of energy demands (Brostrom and Howell 2008).

11.3 Development of the Container House Settlement

11.3.1 The Project Site

The project site is located near Qeparo, 82 km from Vlora and 40 km from Saranda. The site is on the right side of the national highway Vlora–Saranda on the north and on the south is the newly built promenade and the seaside (Fig. 11.1). On both sides of the site, there are secondary roads that make it accessible. The biggest part of Qeparo is located in a flat green area, and the old part of the village is uphill. It is mainly covered by olive trees. The surrounding area has mostly one- and two-story buildings, which are residential buildings, vacation houses, hotels, restaurants, and bars. There are also some camping areas for tourists who want to experience a unique way of vacationing.

Fig. 11.1 Views to the site and the site location (*Source* Authors)

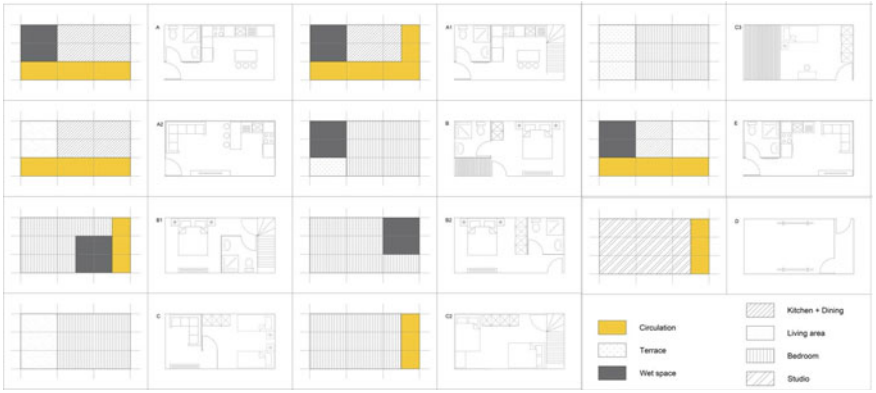


Fig. 11.2 Unit typologies (*Source* Authors)

11.3.2 Unit Typologies

One shipping container is designed to host all the living activities that are common to the needs of a family. There are 11 designs of such modules (Fig. 11.2). The spaces inside the containers are divided with the use of a 3 × 6 grid, which gives a unit of 100 × 80 cm. Residential spaces start from the smallest unit of 1 × 2 grid modules, which are used for the circulation; 2 × 2 module is used for the bathroom and for the activity space (kitchen module, dining space, sofa of the living room); 2 × 3, 3 × 3, and 3 × 4 modules shape the bedroom, or the big living room; and 3 × 5 module is used for the double bedroom or studio space.

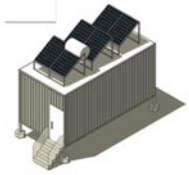
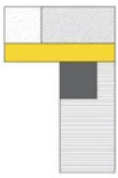
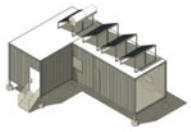
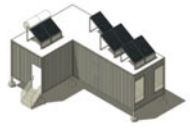
11.3.3 House Typologies

From the eleven units, there are twelve different house typologies, starting from the smallest, which has one unit, to the biggest, which has five units. The houses are designed to have different capacities. They range from one- to two-story, with various room arrangements and designs. The area of the house varies from 18 to 90 m^2, with the capacity to host 1–7 residents. The plans for each typology, 3D views, spatial distribution, total area, and number of residents are given in Table 11.1.

11.3.4 Modular Land Use Plan

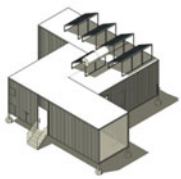
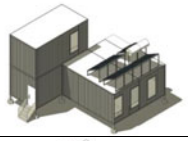
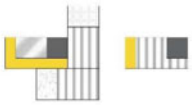
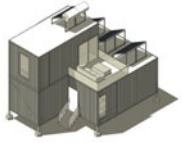
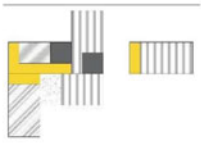
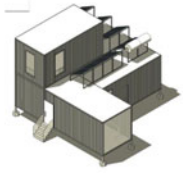
The site is located near the main road, and it has two secondary roads on both sides of the site to make it accessible for each unit house. Firstly, the site is divided into 20 × 20 m squares, forming a grid. The reason behind this decision is that 400 m^2 is very

Table 11.1 Housing typologies and their main parameters

Typology number	Spatial zoning	Unit plan	3D view
Unit: 1 Modules: A Area: 18 m^2 Residents: 1			
Unit: 2 Modules: A2 + B2 Area: 36 m^2 Residents: 2–3			
Unit: 3 Modules: A + C Area: 36 m^2 Residents: 3–5			
Unit: 4 Modules: A + C Area: 36 m^2 Residents: 3–5			
Unit: 5 Modules: A+B+C Area: 54 m^2 Residents: 5–7			
Unit: 6 Modules: A + B2 + C Area: 54 m^2 Residents: 5–7			
Unit: 7 Modules: A1 + B1 + C Area: 54 m^2 Residents: 5–7			

(continued)

Table 11.1 (continued)

Unit: 8 Modules: A1 + B1 + C Area: 54 m^2 Residents: 5–7			
Unit: 9 Modules: A + B2 + C + D Area: 72 m^2 Residents: 5–7			
Unit: 10 Modules: A1 + B + C + C2 Area: 72 m^2 Residents: 7–9			
Unit: 11 Modules: A1 + B1 + C + C3 Area: 72 m^2 Residents: 6–9			
Unit: 12 Modules: A1 + B2 + C + C2 + D Area: 90 m^2 Residents: 7–9			

Source Authors

suitable for building a house, including interior and exterior spaces. After forming the grid, the site is further divided, and the spaces that are used for the houses are divided from the spaces with the existing trees. There are five different common areas: the swimming pool area, the playground, the relaxing area for the seniors, the common garden, and the area where the citrus trees will be planted (Fig. 11.3).

To go more in detail, the site is divided into a 5 × 5 m^2 grid. This method is used to differentiate the green area (trees), empty spaces (grass and gravel), and the footprint of the house. Each house has a road that connects it to the secondary road. Each property has a private parking spot, an outdoor space, a garden, and green areas.

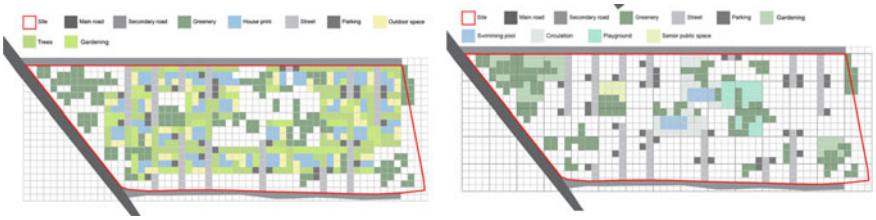


Fig. 11.3 Distribution of the private spaces (left) and public spaces (right) (*Source* Authors)

11.4 Calculation of Photovoltaic System and Water Heating System

11.4.1 PV Panels

The design goal of the photovoltaic system is to produce the energy needed for the entire summer season. For each house, standard equipment such as a refrigerator, stove or oven, microwave, coffee maker, toaster, washing machine, TV, iron, hair dryer, air conditioner, and personal items of the residents such as a laptop and phone charger are taken into consideration. The energy consumption is calculated based on the number of residents for each house typology. The proposed system is a battery system for the off-grid situation but is connected to the grid in case there is a power outage. Knowing that Qeparo has approximately 300 sunny days per year, this system is the best solution.

The application PV-Solar Power System (Al-Haddad 2014) is used to calculate how much energy is needed for each household per day. The application requires a list of equipment, the duration of work per day, and the average wattage per appliance. After calculation, the overall amount of energy in watts for each house is shown, as well as the capacity of PV panels, the number of batteries, and the battery capacity. The results of the calculation are shown in Table 11.2.

For different housing typologies, the necessary number of PV panels increases from 5 to 10 units, depending on the size of the house and the expected number of residents. In the majority of cases, it is also needed to have four batteries, but the capacity of the batteries is different depending on the size of the dwelling unit.

11.4.2 Water System

Taking advantage of the local climate, a rainwater harvesting system is selected to provide water for all the homes. This system contributes to the overall sustainability of the settlement and is self-sufficient. The roof area of the housing units is used to collect water, which is sent to partially buried tanks for storage. The amount of water that a four-person family uses is about 300 L per day, which makes 9 m^3 per

Table 11.2 Energy parameters of housing typologies

Typology number	System voltage, V	PV panels' power, W	No. of panels	No. of batteries	Battery capacity, A
Unit: 1	24	5710	5	2	813
Unit: 2	48	7580	6	4	1080
Unit: 3	48	6270	5	4	893
Unit: 4	48	6270	5	4	893
Unit: 5	48	9020	7	4	1280
Unit: 6	48	9160	8	4	1305
Unit: 7	48	9160	8	4	1305
Unit: 8	48	9160	8	4	1305
Unit: 9	48	12,100	10	4	1725
Unit: 10	48	9750	8	4	1390
Unit: 11	48	9970	8	4	1350
Unit: 12	48	12,100	10	4	1725

Source Authors

month. Qeparo does not receive much rain during the summer season, but water can be collected during the other seasons. The gray water system includes the water used in showers, sinks, and washing machines. It can be filtered and collected in a tank that can be used to water the garden and the green areas. The hot water is provided by a solar hot water heater. One regular water heater consumes 1500 W per hour and works for an average of 5 h per day. Two solar water heaters can satisfy the demand for hot water for each housing typology.

11.5 Conclusion

The purpose of this study is to design sustainable and passive houses with shipping containers. There are large amounts of shipping containers that are left unused around the world. The focus of the entire project is to work with reused materials and provide a more sustainable and eco-friendlier lifestyle. Houses are designed to be self-sustaining, which means the use of renewable energy, which is harvested from the sun using solar panels, and the water is collected from the rain. Filtered wastewater can be used for other purposes, such as gardening. These sustainable housing standards ensure the highest level of energy efficiency and comfort, while their small footprint reduces material use and environmental impact.

This project is the starting point for the promotion of building sustainable houses along Albania's seaside. These kinds of houses fit well with the flora of the Riviera. The buildings are built using modular units, which are assembled directly on site. The owners are able to move their houses from region to region. This idea may attract

more attention, not only from the locals but also from tourists. This initiative may help the economy and promote sustainable and temporary construction with minimal inputs from nature instead of typical concrete Albanian buildings. Container houses can be considered in the long term; this is a better investment for owners and for the environment. This type of transportable modular and easily assembled architecture can also be used for the construction of isolated houses or remote shelters, which became relevant again in COVID-19 post-pandemic times.

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Chapter 12
Prototyping a Peripheral Coworking Space in the Post-Covid Era: Proposal for an Architectural Competition

Anna Yunitsyna, Mina Di Marino, Chiara Tagliaro, Karel Smejkal, and Ernest Shtepani

Abstract Coworking spaces (CSs) have been demonstrating their ability to act as multifunctional, safe, and healthy hubs. Over the last decade, there has been a boom all over the world, especially in developed countries. On the contrary, developing countries still lag behind in implementing such spaces. However, coworking spaces may significantly contribute to the economic and social progress of developing countries that have been challenging several issues resulting from rapid urbanization and difficult living and working conditions, mainly in peripheral areas. The main aim of the study is to explore how coworking spaces can contribute to solving these problems in the peripheries, which can attract people after the pandemic, considering the move out of the biggest cities and the increase in employees and freelancers working remotely. Firstly, the study presents a general overview of coworking spaces in both Western Europe and Eastern Europe, including Norway, Italy, Russia, and Albania. Then, the study discusses possible scenarios for the expansion of coworking spaces in urban peripheries and peripheral areas that would be beneficial for the local communities and economy, and it would fill a void in the current provision of these service spaces throughout the territory. The study suggests designing a prototype

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for an educational and coworking hub that can be quickly installed in the urban peripheries. The prototype for coworking will be based on standardized construction, be easy to build in multiple locations, and include all necessary infrastructures. In order to design such a project, it would be necessary to conduct a step-by-step process of analysis of case studies, including construction methods such as containers and prefabricated elements that respond to community needs and would make the construction possible in a short time. Thus, the idea would be to create a coworking unit, or "hub", that can be replicated in various peripheries. These types of hubs can also combine coworking and coliving functions. As a conclusion, these prototypes of "plug-in coworking spaces" could be scalable in multiple marginal areas and disadvantaged neighborhoods after the pandemic. Being spread in peripheral areas and small towns, these centers may become social catalysts and create multiple activities that can be beneficial for large groups of populations and may change living, working, and mobility patterns after the pandemic.

Keywords Coworking spaces · Prototype · Peripheral areas · Implementation

12.1 Introduction

Coworking spaces (CSs) have been demonstrating their ability to act as multifunctional, safe, and healthy hubs. Over the past decade, there has been a boom all over the world, especially in developed countries. On the contrary, developing countries still lag behind in implementing such spaces. However, coworking spaces may significantly contribute to the economic and social progress of developing countries that have been challenging several issues resulting from rapid urbanization and difficult living conditions, especially in urban peripheries.

The main aim of the study is to explore how coworking spaces can contribute to developing urban peripheries. This is also one of the objectives of the COST Action CA18214 (2019–2023), "The Geography of New Working Spaces and Impact on the Periphery" (http://www.new-working-spaces.eu/), funded by the European Union, in which three of the five authors are currently involved.

Firstly, the study presents a general overview of CSs in both Western Europe and Eastern Europe, including Norway and Italy as examples of Western countries and Russia and Albania as examples of Eastern European countries. Afterward, the study discusses possible scenarios, such as the expansion of coworking spaces in urban peripheries, that would be beneficial for the local communities and economy and would fill a void in the current provision of these service spaces throughout the territory.

The study analyzes functions and activities in contemporary CSs, including the types of spaces (e.g., meeting rooms, offices, open spaces, cafeterias, etc.). Additionally, the study aims to investigate location factors (in peripheries and centers) and socio-spatial and economic dynamics related to the growing phenomenon of CSs.

To encourage such expansion, the study suggests designing a prototype for an educational and coworking hub that can be quickly installed in the urban peripheries, which can be revitalized after the pandemic, considering the new working and living habits of residents (e.g., choosing CSs and larger dwellings). The prototype for coworking will be based on standardized construction, be easy to build in multiple locations, and include all necessary infrastructures. It would be necessary to have a step-by-step process of analysis of case studies, including construction methods such as containers and prefabricated elements that respond to community needs and would make the construction possible in a short time. Thus, the idea would be to create a coworking unit that can be replicated in various peripheries. A "hub" will be designed that provides a safe, healthy, and comfortable working environment, and it will also provide some additional facilities, such as meeting rooms and equipment for presentations and video conferences. These types of hubs can also combine coworking and coliving solutions.

12.2 Overview of the Coworking Spaces

According to projections, there will be some 41,975 coworking spaces worldwide by the end of 2024 (https://www.statista.com/statistics/554273/number-of-coworking-spaces-worldwide/). The literature confirms that Europe has the highest production of scientific studies on the topic, and it also counts more CSs than any other continent (Berbegal-Mirabent 2021).

12.2.1 Coworking in Norway

In Norway, there are around 155 today CSs (including Oslo) and 70 maker spaces (see the database constructed by the two COST members, Mina Di Marino and Hossein Chavoshi; see Di Marino et al. 2023). The highest concentration of CSs occurs in large urban settlements such as Oslo, Tromsø, Kristiansand, Stavanger, Bergen, and Trondheim, as well as medium-sized cities such as Drammen, Moss, and Larvik. CSs have been proliferating in the last decade, representing an emerging phenomenon to analyze among academics themselves and between them and policymakers, official planners, and stakeholders.

Oslo is the most attractive city for different forms of coworking. In Oslo, there are 57 CSs in total: 3 semi-private and 37 private, 16 libraries that provide formal and informal coworking spaces, and 9 maker spaces (public and private) (Di Marino et al. 2022). Oslo hosts a relatively high number of innovative firms among EU cities. Oslo has solidified its status as one of the most investible medium-sized cities worldwide, and thus, it can be considered a technology and data platform that supports the expansion of clusters of start-ups and entrepreneurs, a supportive ecosystem, and access to funding (Oslo Business Region 2017). The city is therefore identified as

an internationally important location for innovation and the attraction of knowledge workers. These factors may increase the proliferation of CSs.

In addition, there are large corporations, such as Regus, which manage eight premises in Oslo that are located in the most central and/or accessible districts of the city, as well as small corporations and independent managers. Other public and private CSs are in more peripheral areas but mainly placed in multifunctional buildings and/or districts, and some of them in science parks (see, e.g., Startup Lab). Furthermore, in the City of Oslo, both central and peripheral public libraries provide free CSs (both planned and unplanned spaces for working) and maker spaces (Di Marino et al. 2022). The surrounding areas of public libraries are multifunctional and vibrant due to the flows of people who visit the library and other spaces. Some location factors are common among the central and peripheral CSs. They are mainly related to: (i) accessibility to public transport (mainly metro/bus stops and train stops); (ii) proximity to other services and amenities; and (iii) proximity to universities, research institutes, and science parks.

Furthermore, peripheral and rural CSs around Norway have recently opened (between 2012 and 2019). Some CSs are in very dispersed peripheral regions (ca. 300–500 km from the largest urban settlements). These peripheral CSs are seen as multifunctional and community hubs for several reasons. For example, they host between 30 and 100 members and are very attractive to highly specialized people (self-employed, entrepreneurs, and employees) from the public and private sectors, as well as real estate developers (Di Marino et al. 2022). Under the pandemic, peripheral CSs have never closed (except after the first wave of 2020), while the CSs in the cities had to turn most of their activities performed in person at the office digitally (Sinitsyna et al. 2022). They were also able to further expand their network and business at the national and international levels. Digitalization, private investments, and public support (see Innovation Norge), as well as the quality of life in peripheral and rural areas, have represented the key factors of successful peripheral CSs (Di Marino et al. 2023).

12.2.2 Coworking in Italy

In Italy, coworking has undergone a rapid expansion since 2010, when there were only about ten shared workspaces, almost all concentrated in the largest cities in the center and north of the country. Over the years, the numbers have increased a lot, and coworking is now a highly diversified and varied phenomenon, which includes spaces ranging from 100 to over 5000 m^2, operated by independent as well as professional managers, etc.

In 2020, Italian Coworking (Italian Coworking 2020) counted 779 CSs (one coworking per 76,000 inhabitants), +76 compared to the previous year. Big disparities in numbers still characterize the coworking ecosystem. The highest concentration of CSs is in the Lombardy region, with 218 spaces in 2020 (one every 44,000 inhabitants), more than half of which are located in the city of Milan (1 CS per 10,000

inhabitants). It is not surprising that Lombardy hosts about 30% of all the CSs in Italy. Sixty % (472) of them are in the north of the country. The most relevant cities following Milan are Rome, Turin, Bologna, Florence, Naples, Verona, and Venice. Large cities remain more attractive for CSs: one out of three CSs in Italy is located in cities with more than 500,000 inhabitants; one out of four operates in cities below 50,000 inhabitants; and only 15% of all CSs are found in towns with less than 20,000 inhabitants.

This trend confirms the studies on the factors that tend to polarize CSs in urban areas and in the highest knowledge and innovation intensity suburban clusters (Manzini Ceinar and Mariotti 2021), such as the high concentration of urban amenities (Van Oort et al. 2003; Zhou 2019), the closeness to public transportation (Mariotti et al. 2017), and the availability of open access internet connections (Di Marino and Lapintie 2017). However, the Veneto region is an exception in this scenario, as it is undergoing an unusual growth of CSs in small centers. Similarly, regions like Puglia and Tuscany promise to become more attractive thanks to the launch of dedicated recovery policies.

Most of the spaces are small (65% are below 300 m^2). According to an empirical study conducted within the COST Action CA18214, CSs in Milan are single-location, fee-based, and managed by private operators. The majority of Milanese CSs are placed in residential buildings or in ex-industrial buildings, which means that they tend to be dispersed around the Central Business Districts (CBDs) and thus in areas that present cheaper rents and more availability of premises (e.g., industrial sites). Also, in Milan, CSs tend to cluster around specialized sectors (e.g., neighborhoods hosting the Design Week have attracted CSs specializing in design and fashion).

After the COVID-19 pandemic, the development of CSs in Italy has been following clear patterns: The size of the city and the capacity to attract investments are likely to be the key drivers for the spread of CSs beyond pandemic times.

12.2.3 Coworking in Russia

The first coworking in Russia was established in 2008 in Yekaterinburg (Trushkova and Kvekveskiri 2020). During the last decade, CSs in Russia started to emerge, but still, the majority of them are concentrated just in the two biggest cities, Moscow and Saint-Petersburg. The economic crisis of 2014–2015 became a breaking point, which pushed the development of CSs since young entrepreneurs, small businesses, and start-ups wanted to reduce their overall expenses. In this period, the number of CSs had doubled, and they were able to offer several services that replaced the provision of ordinary offices. The growth in popularity of CSs is significantly linked with businesses in Russia (40%) and also with the rising number of remote workers (Belova 2018). Currently, 52% of all the spaces are concentrated in Moscow (Revinova et al. 2020); moreover, the Moscow government's program "Moscow. Coworking 2.0" aims to create a network of both public and private CSs that should serve the needs of freelancers and small businesses as well as large companies. The overall network

of existing spaces in Russia is underdeveloped. It can be noticed that there are some direct connections between the population of the city, the income average, and the presence of CSs. The demand can be found in cities with a population above 500–700 thousand people (Belova 2018). The potential of coworking seems to be underestimated, and there is a demand for increasing the number and size of them as well as attracting new members (Poltavskaya 2014).

The main users of CSs in Russia are small businesses (64%) and freelancers (30%). The members are not visiting the coworking space on a regular basis, but there is still a high demand for flexible opening hours since some of them prefer to work during the evenings, nights, or weekends. The main factors affecting the members' choice of a CS are the location and rent costs. In Moscow, most of the CSs are concentrated in the city center. Among all the facilities, the most demanded are the kitchen, cafeteria, lounge areas, and meeting rooms. However, some businesses may also offer conference halls, hotels, gyms, and showers (AIM 2019). CSs offer various types of workplaces, starting from the simple "dynamic workplace", where the user may occupy any free desks, but the own devices should be brought for working to the "fixed desk" and using separate offices with additional legal or accounting services (Makarov et al. 2019).

Many CSs in Russia promote themselves as trendy places for meetings, networking, the exchange of professional experience, and creativity boosters. The main customers are the millennials who do not network anymore in traditional offices. Therefore, new forms of working and activities are promoted, and some CSs are conceptualized to attract specific groups of professionals. Together with the ordinary mini offices, there are offered beauty coworking, IT zones, sewing workshops, architectural workshops, and art and design spaces (Trushkova and Kvekveskiri 2020). In these cases, the CS communication works on the professional equipment, which can be shared and become the key elements of the thematic community of coworkers.

The COVID-19 pandemic has seriously affected CSs in Russia. From one side, the number of remote workers had increased, but the necessity to create safe and healthy environments and reduce social interactions challenged the CSs themselves. Safety measures and social distancing can be seen as somehow controversial given the initial nature of coworking as a space for networking, interaction, and communication among professionals. During the pandemic, large companies tended to reduce their regular office spaces and shift toward hybrid or flexible offices. Therefore, CSs were reoriented to the new corporate clients. The new format of the short-term rented "flex office", which has several infrastructures, such as office spaces, a kitchen, a meeting room, and a resting room, and can fit 30–50 people, is replacing free and chaotic coworking hubs (Utehin and Denisova 2020). Also, the design of interiors becomes minimalistic and flexible, and furniture and related materials that present hygienic properties are preferred. In 2020, the growth of demand for flexible offices was observed, but the market was filled by large networks offering bigger spaces. Small CSs that are below 300 m^2 could not compete anymore in this field (Dmitrieva 2020).

12.2.4 Coworking in Albania

The majority of the CSs in Albania are situated in the "Posh" central Tirana neighborhood. In the periphery, people with low incomes are mostly concerned with "surviving" on a daily basis. The models of work in the periphery are mostly "non-office" jobs such as those in the construction industry, textile factories, farming, or other working-class, blue-collar jobs.

The city center of Tirana, conversely, offers various activities attracting young people interested in white-collar jobs and lots of companies in the tertiary sector. Unfortunately, these places are more focused on targeting the higher-income people in the central part of the city. Within Tirana City Center, there are dozens of CSs. In Albania, most of the CSs are multifunctional units that originate from coffee bars and cafeterias. In 2018, Albania became the country with the highest number of coffee shops per person in the world (Oculus News 2018). Before that, even CSs were opened in the coffee shops near the universities and functioned as "third places". Students could study, read, discuss, and use the internet after ordering a drink. Although coworking spaces in Albania are improving and expanding, the typology of spaces that CSs offer is really simple and often provides a bar, a meeting room, working desks, etc. The analysis of data on coworking spaces in Albania is still under way.

12.2.5 Remarks

The study shows the main characteristics from the overview of coworking places in four countries, namely Norway, Italy, Russia, and Albania (location, types, architectural features). Findings reveal that in Albania, most of the coworking places are placed within the ring road of the city center of Tirana, similarly to Italy, where they are aggregated in the surroundings of CBDs in large cities like Milan. In Russia, during the last decade, coworking started to emerge, but still, the majority of the spaces are concentrated just in the two biggest cities, Moscow and Saint-Petersburg. However, from the experience of Norway, it is possible to anticipate a promising future for more peripheral CSs as multifunctional and community hubs, which could help CSs thrive in post-pandemic times.

In the following part, we present an attempt to boost the development of CSs thanks to the design of a prototype that can be replicated across territories and in different countries.

12.3 Directions for Future Research and Experimentation Coworking Space in the Post-covid Era

The project for a coworking space is relevant because it could be instrumental in improving the conditions for employment in peripheral areas. Using low-priced construction such as prefabricated modular buildings that are transportable and adaptable to various construction sites could be a great opportunity for increasing the development of new working places in different countries. Nevertheless, experimentation in this field has not advanced much up until now. There is an evident need for in-depth studies on building types and construction techniques that apply to CSs. Even though the CS literature is well-developed in countries like Germany, Italy, the UK, and the Nordics, few studies have focused on these characteristics and have tried to figure out ways to maximize and optimize the creation of coworking spaces where they are most needed, e.g., peripheries.

The way an expansion project could be envisioned is by creating a "blueprint" for a prototype of a coworking space. This could include a bathroom, utilities, and a small kitchen in a concentrated core, and the rest of the space could follow the "free plan" principles for a space that is accessible, open, multifunctional, and that could function as an office, meeting room, and classroom at the same time. A two-stage competition for a coworking prototype in the peripheries could be an effective tool to explore the potential of such a prototype. As a start, the project could be about 300 square meters in surface area (i.e., smaller than the average size of a CS) and include basic elements such as an entrance lobby, multifunctional hall, and meeting place, which could function as well as a classroom for courses or training and collective working places. Although this coworking space could work as well as a youth center, the intention for it is that it could function more as a space or hub for activities and incentives for young people, such as start-ups, design spaces, and other opportunities that create the possibility for a healthy community. The coworking prototype, if replicated, can offer an interesting acupuncture intervention that could act as a catalyst for economic and social growth.

Figure 12.1 is a design diagram that emphasizes the concepts of flexibility, self-sustainability, and multifunction that a coworking space can offer. The idea of a prototype that could be built to enhance the youth's working skills should emerge from such a competition.

Eventually, these prototypes of "plug-in coworking spaces" could be scalable in multiple marginal areas and disadvantaged neighborhoods. Being spread in peripheral areas and small towns, these centers may become social catalysts and generate several activity growths that affect a large group of the population.

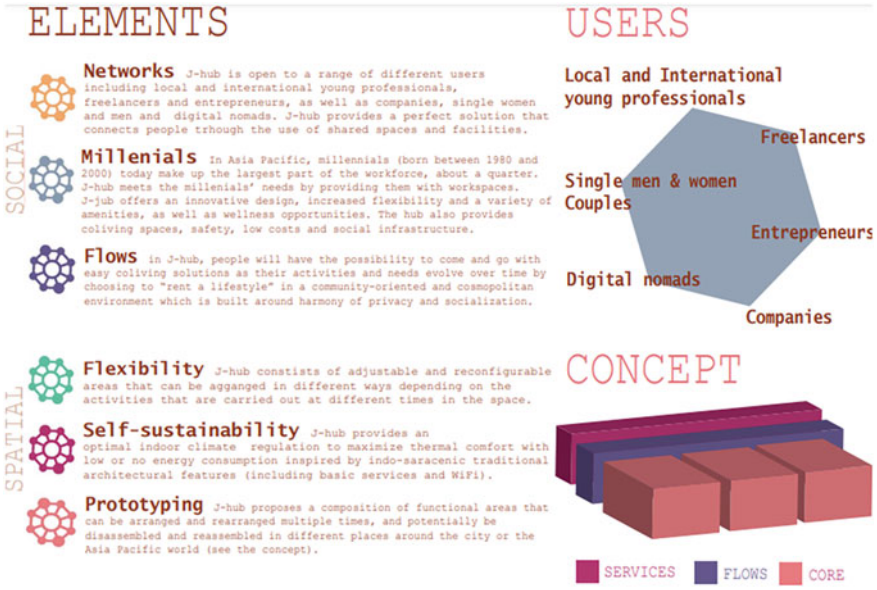

Fig. 12.1 Concept for a coworking space Authors: Mina di Marino, Chiara Tagliaro and Ernest Shtepani (design for a competition, *Source* Authors)

12.4 Conclusion

Even though CSs have been expanding over the years, they tend to concentrate in the centers of large cities. However, as the example of Norway suggests, CSs could also have a florid future in peripheral areas. The development of CSs in these areas, though, is still slow and could be accelerated by prototypes after the pandemic, considering that people may choose more flexible and multifunctional working spaces, which are larger and safer than traditional offices.

The prototype for "Coworking Spaces" includes using a generic plan to achieve maximum flexibility with the smallest investment. Minimal space modeling for functioning coworking spaces involves a multifunctional lobby, a meeting room, a working space, a small kitchen, and toilets. Therefore, in order to create a prototype, the idea of launching an architectural competition could be effective.

As for the issue of construction, the ideas, and principles behind the prototype are to build out of prefabricated modules that are easily assembled and are low-cost. Also, other features of the prototype are that it could be self-sustainable and energy efficient and that all the water infrastructures are well-placed to facilitate construction.

The competition can be a part of the INSPIRELI platform and launched accordingly. The idea is to develop a two-stage competition that clearly states the conditions and tasks. The initial action is to find a site and a municipality in Eastern or Central Europe interested in developing the two-stage competition. The next step would

be to create the competition brief, which includes a diagram of spaces included in the coworking prototype, functionality, areas, construction model, low cost, sustainability, etc. Cooperating with a municipality and a construction company for modular buildings is a necessary method.

The outcome of the first stage is to generate a set of ideas from young architects, where the first places would be considered for follow-up. The second stage could be envisioned as a competition, which can involve a local studio aiming to design a project that could be potentially implemented. It is important to organize the competition in such a way that the results will indeed be a design that is implementable at a low cost and replicable in different peripheries and that could act as a game changer for society.

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Chapter 13
Civilization Resilience: Luxor Heritage Then and Now. Effect of Covid-19 on Heritage and Touristic Sites Between Egypt and Las Vegas

Ahmed Y. Rashed, Ayman Abdel Hamid, and Merna A. Ebeid

Abstract Luxor, known as Thebes, is a world-famous monument and one of Egypt's significant tourism hubs. Luxor's shape and fabric tell a story of more than 4000 years of evolution and history. Luxor's preservation and to be sustained is a challenge along with its history, which has been accompanied by constant physical reality, social reality, and administrative upheaval. In the last few decades, rising populations mixed with swarms of visitors visiting each year have wreaked more harm than thousands of years of erosion. Requests for Luxor's preservation have been raised, with research and studies which have already been conducted; however, actuality is very much a challenge. A mock-up of the Luxor legacy was featured in the Luxor Mega resort and hotel project in Las Vegas (1989), as a symbol of the American Dream. The hotel, which has 4400 rooms and 120,000 square feet of casino space, was designed as big as the Great Pyramid of Egypt rising from the desert and attempting to match its spirit. Prefabricated "Egyptian" attractions and structures, such as replicas of graves and monuments of kings and queens, are strewn across the vast floor of Luxor. The economics of using replicas to market "tradition" as a tourism tool is remarkable. Contrary to popular belief, many people now link the name "Luxor" with "Luxor, Las Vegas," instead of the ancient Egyptian metropolis of Luxor! The question asks itself, is the open museum of Luxor inspired by Luxor Las Vegas and vice versa? This leads to wondering about the authenticity that Egypt possesses but employs it incorrectly. The focus of the paper is important for two reasons: first, to highlight Luxor Tales, as well as the replica of the Luxor in Las Vegas, in terms of tourist administration and Heritage preservation, and foremost, to examine the old and new

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normalcy of Luxor history and its replica beyond 2020 and Covid-19. Furthermore, in this increasingly globalized world, this dialogue between the two Luxors' issues due to cultural and intellectual property led to the creation of a new phenomenon that goes by Civilization Rights.

Keywords Culture heritage · Tourism · Luxor Egypt · Luxor Las Vegas · Covid-19

13.1 Introduction

Since the dawn of time pandemics and epidemics existed, yet the Covid-19 epidemic was the most impactful in the field of tourism compared to the past ones. This sparked heated debates due to the recent global events taking place. Covid-19 did not only paralyze the industry of tourism but terrified its stakeholders as well. This led the tourism industry and destinations to seek anxiously for every publication whether it is books or frameworks on how to deal with the epidemic and papers that offered solutions concerning management as they were unprepared to deal with such a crisis.

Destinations were severely impacted, and major market players in the tourism value chain (airlines, hotels, travel trade, cruise lines, tourism businesses) either reduced or completely ceased production for an unspecified period, resulting in a sudden and total cut-off of their revenue streams. Following several months of lockdown, destinations ultimately decided to progressively open up their economies, although in stages. Travel has resumed in certain regions of the world, but it is unclear how the pandemic will influence the business in future due to its unknown development and unexpected effects on the tourist supply chain.

The paper's emphasis is significant. Highlighting Luxor Tales, as well as the replica of the Luxor in Las Vegas, in terms of tourism management and heritage preservation is a crucial discussion from many aspects and how both places now share the same economic issues. Moreover, to explore the old and new normality of Luxor Egypt and Luxor Las Vegas post the 2020 pandemic.

Furthermore, in today's increasingly globalized world, the emergence of "Civilization Rights" is necessary due to intellectual and cultural property issues.

13.2 Problem Definition

The Covid-19 pandemic in early 2020 caused an extraordinary crisis that has had and still has a significant impact on heritage assets worldwide. This has led to socioeconomic repercussions, community disruption, reduced maintenance, and lack of management and preservation leading to concerns about conservation monitoring. Covid-19's impact is a long-term one leading to present today's challenges with

additional solutions and research. This will be studied on Luxor Egypt and its replica Luxor Las Vegas, to also highlight.

13.3 Methodology

This paper employs a qualitative approach, encompassing descriptive research to expand knowledge on the current pandemic and its impacts on heritage and touristic sites highlighting and using Luxor as a case study and its replica, Luxor Las Vegas. Moreover, explaining and validating the findings on the solutions and procedures used to manage these impacts.

These are done through standard literature review, data collection and analysis, and lived experience.

13.4 Luxor: Egypt and Las Vegas

13.4.1 Egypt's Luxor

Luxor was Egypt's ancient capital, also known as Thebes (Fig. 13.1). It was established by the Nile River with the East Bank where the sun rises was dedicated to daily events and activities, while the West Bank where the sun sets is for burial ceremonies. Early Pharaonic dynasties (3000 BC) are the time when monuments and antiques dated back. This is besides the Roman, Coptic, and Islamic Dynasties.

'World Heritage Sites' such as the King's Valley, the Queens' Valley, and the tombs of the Noble which are all considered Royal Tombs are among the things that are considered Luxor's prominent landmarks. Furthermore, The Colossi of Memnon, the Karnak temple, which is the most majestic pharaonic temple, and the Luxor temple are masterpieces in Luxor. They are considered as a representation of the greatest cultural achievements of mankind and early civilization (Rashed and Hanafi 2015).

13.5 Luxor Initiatives: Tales About Luxor

Luxor is a tale within itself that is seen from the eyes of everyone who visits or lives in it differently, that is why an initiative in the form of competition by the title of "Luxor Tales" was developed as a way of documenting these tales and grasping the great effect that Luxor laid upon its visitors and settlers (Fig. 13.2).

The competition target group was for anyone who visited, lived, or planned to visit Luxor City whether from the national or international community. The base of the

Fig. 13.1 Luxor Egypt (*source* authors)

Fig. 13.2 Luxor's heritage is one of Egypt's main cultural resources with local, regional, national, and international interests (*source* authors)

competition was for the Luxor Museum of Stories, and these stories were presented in various forms of media.

Covid-19—the pandemic has caused the closure of cultural heritage places and institutions, depriving people of the ability to appreciate and experience their legacy while also incurring massive economic losses and disturbing the livelihoods of many people who rely on cultural heritage for their survival. Following the lockdown, these historic sites are progressively reopening under the "new normal," which is governed by regulations aimed at preventing the spread of this highly deadly disease.

In this circumstance, it is critical to consider what precautions should be taken while reopening a historical monument or a cultural institution like a museum.

How do we adapt them to new requirements such as social segregation and the necessity for quarantine and homeless shelters?

13.6 Cultural Heritage and Tourism: Luxor of Egypt? Las Vegas?

13.6.1 Authenticity and Copyright in the Heritage Market

Heritage is a wide term that encompasses both natural and cultural contexts in which "something is passed down from generation to generation" (Nuryanti 1996). It is the portion of the built environment that has a unique value to the user and is thus a valuable resource in the specific urban setting. Artifacts, monuments, historical remains, buildings, architecture, philosophy, traditions, celebrations, historic events, distinctive ways of life, literature, folklore, and education are all examples of heritage in the cultural context.

Because it is primarily a property and a commodity, exclusive rights must be established to ensure its survival and prosperity (Liechfield 1988). The nature of these rights differs depending on the types of heritage as well as the type of ownership. When specific values are associated with a piece of property, it becomes important to have a "heritage tenure," which is a type of tenure that extends beyond the proprietor's legal protection. Many questions arise in this situation; what are these specific values? Who assigns these values to that particular piece of history? What type of tenure does legacy tenure entail?

13.6.2 Luxor of Egypt

Even though Luxor, Egypt has a global dimension in terms of being a "World Heritage Site," its Egyptian originality is undeniable, and it is for this reason that International Cultural Tourism Charter (ICTC 1999) states in Sec. 4.1 that "the needs and wishes of some communities or indigenous peoples to restrict or manage physical, spiritual or intellectual access to certain cultural practices, knowledge, beliefs, activities, Artifacts sites should be respected", the charter also states in Sec. 4.2 that "The rights and interests of the host community, at regional and local levels, property owners and relevant indigenous peoples who may exercise traditional rights or responsibilities over their land and its significant sites, should be respected. They should be active in developing objectives, initiatives, regulations, and procedures for identifying, conserving, managing, presenting, and interpreting their heritage resources, cultural practices, and contemporary cultural manifestations in the context of tourism."

However, because these relics are considered artwork, they are likely to have copyrights "only the person who created the copyrighted work is legally permitted to reproduce, perform or display it, Any illegal use of any of these rights is referred to as "copyright infringement" and is punishable in federal court" (Wilson 1994).

13.6.3 Luxor of Las Vegas

13.6.3.1 Luxor Las Vegas; Tourism Management and Heritage

Consumption

Las Vegas is a thriving metropolis city, and it is considered a top in the world's fastest developing cities in addition to its being a large land of fantasy. As a result of the rapid increase in the number of tourists, a market of lodgings for tourists has been established. "Luxor Las Vegas" became one of those megastructure projects. Built in the early 1990s with a massive budget of 300 million dollars, the Luxor was assured to be highly stunning. By the time construction was completed, the resort inspired by the Egyptian theme was 30 stories high, with the capacity of 4400 guests, the indoor Nile with ten riverboats alongside a King Tut's tomb clone.

A massive concrete architecture of Egyptian wonder, the Luxor was an urban project. Glass was used in constructing the pyramid alongside concrete with the view of a large sphinx replica, which was designed to use it as housings, recreation, and gambling for tourists. Circus-Circus Enterprises owns and manages the hotel. In April of 1992, the blueprints were nearly completed. The atrium is surrounded by rings of continuous corridor balconies, each a higher level overhanging the one below by around 2 m. The complete atrium is the world's largest atrium hotel. Because of the huge incline, the elevators were a triumph for the engineers, moving up at a 39-degree inclination. A steel-framed reproduction of Egypt's Sphinx serves as the primary entryway. Although the proportions are not exact, the Sphinx serves its purpose admirably.

The Sphinx had to be scaled up to the pyramid, and thus, it is a little bigger than the real Sphinx. The Luxor pyramid in Las Vegas, on the other hand, is significantly smaller than Giza's Great Pyramid, yet it is subject to federal aviation regulations due to its proximity to the airport. With the use of real flora, the area beneath the Sphinx was created to look like a natural Egyptian setting directly off the Nile.

While strolling down the street toward Luxor, you will come across a full-scale copy of sphinxes-avenue (rows of ram-headed sphinxes) comparable to those found at Luxor's Temples of Karnak and Amun (Fig. 13.3). The goal of the project was to produce a pleasant and lasting first impression of the hotel. The statues are identical reproductions in shape, and the wide usage of palms in the hotel setting not only made the land appear more desert-like, but they also provided a lot of shade while we were wandering. A tall obelisk bearing the word Luxor, identical to the one in front of Egypt's Luxor Amun temple, is also present (Fig. 13.4).

Fig. 13.3 Luxor, Egypt (left) Luxor, Las Vegas (right) (*source* authors)

Fig. 13.4 Luxor, Egypt (left) Luxor, Las Vegas (right) (*source* authors)

To summarize, the Luxor Las Vegas project has made a great use of Luxor's history to promote Las Vegas gaming and tourism industries. It has discovered a method to convey these incredible, faraway destinations to individuals who are unable to visit them (10,000 per season). To put it another way, it has created a "culture (heritage) tourism sector" in a strange gaming environment. On the other hand, casino gambling is seen as a genuine source of entertainment that is not going away anytime soon. Annual casino revenue exceeds that of movies, spectator sports, and theme parks put together. Even so, just around 30% of all individuals in the USA have ever visited Las Vegas.

13.7 The Tourism and Heritage Industries and Markets

Even though tourism may not be the only activity that occurs in historical sites, its connection to heritage and conservation activities is distinctive; it is a massive export market and source of income of foreign exchange, it involves a massive amount of people spending millions, it is the largest single item in the world's international trade, and it is frequently regarded as a sector of the economy with a plausible for

development well beyond the shallows (Williams and Shaw 1988). It also has a big impact on the national economy.

The tourist business is difficult to describe. The customer, or "tourist," is the distinguishing feature of tourism, not the products. The majority of definitions concentrate on the benefits rendered to visitors by a wide range of businesses, such as the travel industry, accommodation and restaurants, commerce, and amusement (Eurostat 1998). In the context of international tourism, the United Nations defines a "tourist" as a "visitor staying at least one or two days in a country other than his ordinary place of abode." Tourism, on the other hand, refers to visits made within the same nation by residents of that country.

Tourism had a significant role in attracting visitors to Luxor's "culture/heritage." In terms of social, political, and economic elements, culture/heritage is a resource. Because heritage is regarded as a value in and of itself, heritage objects are well suited for collection, preservation, and presentation. National heritage based on national history "explains the individuality of a nation over time," making it an effective instrument for creating national solidarity and pride, as well as developing a national image (Tunbridge and Ashworth 1996). Additionally, culture/heritage is used as an economic resource in several ways. The so-called culture/heritage tourism industry is the "main commercial activity focused on selling goods and services with a heritage component" (Rashed and Hanafi 2015).

13.8 The Luxors and 2020

Covid-19 impacts are wide-ranged having the methods taken to contain it taking a toll on various aspects of our lives and environment and this including the heritage sites which in turn affects tourism and local communities that profit from this industry.

The pandemic has affected every aspect of the cultural heritage, starting with research to preservation in addition to education and training. In this section, we discuss these impacts (Nostra 2020).

13.8.1 Egypt's Luxor

The Esna Lock has opened on March 17, allowing the final cruise ship to continue down the Nile on its journey from Aswan to Luxor. It was the first glimpse into the impending closures in Egypt and around the world in an attempt to stem the spread of the Covid-19 coronavirus.

Just hours before, the Egyptian government announced that domestic and international flights from Cairo International Airport will cease operations within 48 h, turning a nice three-night vacation into a nightmare for tourists in Upper Egypt. Flight rates quadrupled overnight, leaving few options for getting out of the country, and airlines canceling already-purchased tickets. The situation is deteriorated by the

minute for the next two days, until only four people were strolling inside the Luxor Temple.

On the way from Aswan to Luxor, the scene was repeated as the ship stopped at the usual tourist hotspots: the Philae Temple, Kom Ombo, Valley of the Kings, and Karnak, which are usually packed with visitors, were almost deserted; there were more cats leisurely strolling through the corridors than people (Lodes 2020).

Onlookers are usually moved to pause and think about humanity's achievements when they see magnificent temples dating back to 2055 BC. The brilliant hues of hieroglyphics representing dynastic successions and epic conflicts represent what makes humanity so special: our endurance and perseverance. However, against the backdrop of these gigantic stone temple walls loomed a global pandemic, directly testing this unshakable sense of human invincibility.

13.8.1.1 Pandemic Hit, and Then…

In Egypt's smaller cities, tourism is the lifeblood of the economy. The coronavirus has an estimated population of a few million people. The people who are truly affected are the ones working in the tourism sector.

By the end of March, a busy capital metropolis with a population of 20 million people had come to a halt as the Egyptian government mobility restrictions, mimicked global measures.

Large public gatherings were prohibited, football matches and sports of all types were suspended, and mosque prayers, including Friday prayers, were prohibited in the first wave of restrictions. Muslims are now encouraged to observe the call to prayer at home. Schools and universities were closed on March 15, and Prime Minister imposed a two-week curfew from 7 p.m. to 6 a.m. on March 25. Curfew violators suffer stiff penalties, ranging from a fine of EGP 4000 to imprisonment. The curfew was extended on April 9 for at least another week, until April 23.

13.8.1.2 Amid Covid Pandemic Egypt's Luxor Observes Restoration in the Travel Industry

The Karnak Temple Complex in Luxor, Upper Egypt's monument-rich metropolis, is teeming with visitors as the North African country rebounds from a lengthy, sharp downturn caused by the Covid-19 outbreak (Fig. 13.5).

Luxor's temples and other archaeological sites were alive with activity, especially after Egypt reopened the city's historic Avenue of Sphinxes on Friday following years of restorations (Xinhua 2021).

The historic causeway, which dates back 2400 years, is flanked on both sides by 1057 ram-headed and man-headed sphinxes, attracting people from all over the world.


Fig. 13.5 Luxor during Covid pandemic (*source* authors)

Egypt aims to exploit the reopening of the ancient route to market Luxor as the world's biggest open museum and to showcase the city's unique tourism and historical attractions.

Egypt unveiled the 3000-year-old Sphinxes to the public on Thursday in an extravagant ceremony in the southern city of Luxor, after decades of excavation work.

The ancient pathway, which is around two miles long and 250 feet broad, was once known as "The Path of God." It connects the Luxor Temple to the Karnak Temple, which is located directly north of the Nile River. Egypt intends to capitalize on the ancient route's reopening by marketing Luxor as the world's largest open museum and highlighting the city's unique tourism and archaeological attractions.

13.8.2 Las Vegas's Luxor

When nonessential establishments in Las Vegas shuttered their doors in March 2020 to help stem the spread of Covid-19, it was the first time the world-famous, neon-lit strip had shut down since President John F. Kennedy's burial in 1963. Instead of flashing billboards for blockbuster plays and other Sin City excitement, a scattering of pedestrians and families on bicycles replaced the typical 24-7 stream of tourists and traffic congestion, and LED marquees gave best wishes to the community rather than flashing billboards for blockbuster plays and other Sin City excitement (Gruenwald 2020).

Many months after the epidemic, tourists began to return, and by this summer, Vegas had fully reopened, reverting to pre-Covid-19 norms, which included no capacity limitations or social distancing measures (Freeman 2021).

According to the Las Vegas Convention and Tourist Authority, October was the biggest month since the outbreak began, with 3,390,200 visitors, a 15.5% increase over September and a 7.6% decrease over 2019.

According to the LVCVA, hotel occupancy in October reached 81.6%, with room costs hitting $174, up 11.5% from September. According to the Gaming Control

Board, the September casino wins report showed gaming at pre-pandemic levels, with casinos across Nevada pulling in more than $1.158 billion in house profits, a 41% increase over September.

While it is too soon to tell if the new Omicron variant will affect winter travel, the casinos were already packed with masked players at 6 a.m., and queues for coffee at the Venetian and Palazzo resorts were particularly lengthy.

Furthermore, several resorts are offering unique (and expensive) New Year's Eve packages, as a way of luring in customers and trying to compensate for time and money lost due to Covid-19.

To conclude, Luxor Las Vegas was constructed based on obtaining a profit. Although constructed with unique architectural thinking in the middle of the surrounding hotels. However, more studies and research should have been done, alongside thinking about the other aspects that come with this heritage instead of just the economic aspect, so people could feel the close resemblance to the Egyptian theme as a replica.

13.9 Retelling Luxor: Kebbash Road Reopening

The route between the Luxor Temple and the Karnak Temples is known as Al-Kebbash Road. A wide boulevard leading from the beach was lined with statues of sphinxes, which are found in the temples of Karnak and are shown as a sphinx with a ram's head (Fig. 13.6).

The ram here represents the god Amun, possibly to guard the temple and emphasize its axis.

This road was known as "Wat Nathr" in ancient Egypt, which meant "God's Path." The rams' path in Karnak's temples was called "Ta-Mit-Rahnat," which also meant "Al-Kebbash Road."

Fig. 13.6 Kebbash Road development (courtesy of ArchPlan Architects)

When talking about an occurring event, the main aim of the event should be kept in mind. This requires to question, was the objective for the reopening of the Kebbash Road is to compete with Luxor Las Vegas? Even though the authenticity and the originality of the story belong to us. With this thought comes disappointment that there is a need felt to assure that Egypt's Luxor is better (Marie 2021).

Abt Associates were hired by the Egyptian Ministry of Housing, Utilities, and Urban Communities, in collaboration with the UNDP, to create a 20-year Comprehensive Development Plan for Luxor (CDCL). The project's Structure Plan, Heritage Plan, and Investment Projects all address strategies to support expected population, tourism, and agriculture growth while protecting and upgrading antiquities. The CDCL is a major effort to combine the best aspects of comprehensive regional planning with the need to manage a rapidly increasing tourism economy that has the potential to harm some of the world's most valuable archaeological sites. The project has reinforced government institutions functioning at the local and regional levels while also establishing economic ties between the tourism industry, visitors, and the indigenous population. A long-standing absence of tourism infrastructure development, which may optimize the production of local jobs, offer entrepreneurial opportunities, and establish the kinds of facilities and land uses that will encourage orderly tourism expansion, has been one of the major issues. Because historical tensions between the indigenous community and visitors have resulted in bloodshed, it is especially important to include the local population in the planning process from the start rather than after the fact.

As a part of the comprehensive development plan of Luxor, containing six files with one of them turning Luxor into an open museum, stating that this will be done through time, not destruction, as well as protective zones of heritage were to be highlighted. However, that was not the case. A possibility that the scenario of evacuation was the original old scenario then but we do not have a grasp on the original reference.

Luxor was divided into the land of the living on the East and the land of the dead on the West. A wall was not present let alone two, and the assumption of their boundaries was based on illogical thinking.

Having this developmental journey start with a wrong historical truth, whatever comes later would be of no true authenticity to Luxor tales.

13.9.1 How It Went Wrong: Correcting the Retell

Developing a historical, authentic, and large part of the country's heritage place, the symbolism of its history and its relation to the place should be left. As for every demolished action, and even should occur.

Multiple references could be taken for this phase of development taking place. First of all, Berlin Wall, because Berlin was the only city physically divided by the Cold War between the Soviet Union and its Eastern Bloc allies and the West, the Berlin Wall was significant both physically and psychologically (Fig. 13.7).

Fig. 13.7 Berlin Wall then and now

Given the increasing disparity between the two sides in terms of economic riches, freedom of speech, and other aspects, there was concern that if the wall had not been built, Berlin would have been unified in a way that the Soviet side would have lost.

However, it was also psychologically significant since it became a symbol of the schism between two opposing beliefs. This symbolism was perpetuated by preserving portions and pieces of this legacy alongside monuments done for those who attempted to flee it as a method of communicating its narrative and what it stood for back then (Niblett 2019).

Secondly, Acropolis Museum merges between the New and the Old through creative thinking and engineering technology where both times are collaborating to retell the story and symbolism present in this place (Figs. 13.8, 13.9 and 13.10).

These two cases would have been a great reference to what should have been done and could be accomplished with our heritage and civilization story. This collaboration is between realism and creativity while keeping our authenticity.

The development of Luxor took place with no actual studying about how the participation of the locals could affect this phase and how to use them for a more

Fig. 13.8 Acropolis Museum merge between heritage and contemporary architecture (*source* authors)

Fig. 13.9 Researcher in Greece

Fig. 13.10 Acropolis Museum glass floor (*source* authors)

advanced level of creativity as they are the base of the area and its market that serves the tourism market that Egypt is aspiring to advance.

To summarize, more studies should be put for further development and many other scenarios should be thought about. First of all the locals' participation in the market and other aspects. Secondly, in case of other disasters occurring, detailed

studies should be carried out on maintenance work, preservation of the area, and the role of the settlers.

13.10 The Post-Covid-19 Challenges: Management of Archeological Sites

Having global tourism being halted due to Covid-19, a large number of individuals under quarantine sought out cultural and touristic experiences from their communities. This proved the importance of culture with an enormous demand for virtual access to heritage and historical sites, museums, etc.

This opened an opportunity for collaborations and partnerships which could attract new targets and introduce the diversity of experience to this industry. Recommendations by the UNWTO (World Tourism Organization) were made based on research. They suggested an outline to follow that states, and some of them will be mentioned. Firstly, improvement in data and information exchange between the different sectors in order to better understand the pandemic's impacts to come up with solutions and mitigation plans. Moreover, with the launching of innovative alliances and the importance of using the new technology and media, tourism, and culture should form relationships with tech businesses and the corporate sector throughout this digital shift to expand access to online capacity development programs on culture and sustainable tourism. Lastly, the formation of a more resilient cultural and tourism force in which the workers can take immediate action for the recovery of the sector in which innovative employment solutions should be brought up (Organization n.d.).

13.11 Conclusion

The main activity of economic development in Las Vegas and Luxor is tourism. While it is apparent that Las Vegas is doing considerably better in terms of tourist numbers and financial profits, this study does not seek to solely blame the Luxor endeavor for this (Fig. 13.11). While the Luxor project is merely an economic project conducted by a private corporate enterprise, tourism in Luxor city is part of a community development process involving a complex of social, economic, political, and cultural variables.

Luxor Egypt's story has gone through the attempt of being retold; however, whether it was successful or not remains a question to be asked, with several suggestions and examples being given for a better retell that goes along with its history and cultural impact.

Furthermore, the impacts and challenges of Covid-19 have been discussed in the form of a case study in the Luxors and the management of archeological sites has been briefly mentioned with having in mind that the anticipation for further disasters

Fig. 13.11 Luxor nights; left: Las Vegas gaming; right: Egypt sound and light (*source* authors)

to occur should be taken into account and various studies should be done to prevent downfalls that could take place due to these problems.

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Part III
Post-COVID Influence on Cultural, Educational, Social Aspects and Citizens' Behaviour

Chapter 14
A Holistic Approach to Wellbeing Through the Life Course: Topics for Learning by the Pandemic Context Post-2020

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Abstract In a nutshell, the promotion of healthier lifestyles throughout the lifespan makes demands for an integrated and holistic approach to the physical and mental development of children, adults, and older adults. Seamless cooperation between

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the different layers of public authorities, as well as the different society stakeholders is essential, aiming to involve all and leave no one behind. Human ecosystems need local, regional, national, and European support to be able to grow, mainly by providing training and coaching for a more suitable development, as well as financial support to enable the involvement of fragile people with lower opportunities. The role of the European Commission is essential in supporting different elements of such ecosystems and relevant initiatives. One key aspect is to support the participation of grassroot organisations and help them link with international networks, essential in making the voice of citizens heard as a whole, as they are often fragmented and struggle to have their work valued. This paper is based on joint work developed by COST Action NET4Age-Friendly members, in response to the European Commission's Green Paper on Ageing, which was under open consultation in 2021. Contributions are spread over different topics, selected from the Green Paper areas, and they provide a comprehensive summary of a few relevant ideas, from health to ICT and, of course, built environments. Social aspects are at the core of this paper, mainly within the context of the COVID-19 pandemic, whose effects involve both permanent and temporary changes that deeply affected society in both old-real and new-digital lives. NET4Age-Friendly recommends and supports, through its network, the creation and maintenance of local, regional, and national interconnected ecosystems in which all citizens, researchers, businesses, NGOs, health, and social care professionals and authorities are enabled to cooperate in a safe, educative, inclusive, and mixed social environment. Training opportunities, joint learning of skills regarding healthy lifestyles for all ages, friendly ICT usage, adequate housing and independent living, well-maintained and safe indoor and outdoor places and spaces, as well as safe circulation pathways for daily needs have become key areas for action, along with financial security, online connectivity, accessibility, and inclusiveness for all.

Keywords Inclusive environments · Life course health · Smart solutions · COVID-19 · Green paper on ageing

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14.1 Introduction

The main aim of the COST ACTION 19136 International Interdisciplinary Network on Health and Wellbeing in an Age-Friendly Digital World (NET4Age-Friendly) (Web-1) is to establish an international and interdisciplinary network of researchers to foster awareness and to support the creation and implementation of smart, healthy indoor and outdoor environments for present and future generations. NET4Age-Friendly further aims to overcome the fragmentation and the critical gaps at both conceptual and pragmatic innovation levels for responsive, age-friendly, and sustainable environments to address future requirements for research policy in Europe.

The main approach of NET4Age-Friendly is the establishment of new local, regional, and national ecosystems, or the expansion of existing ones, in the 50 countries involved, to work on health and wellbeing in an age-friendly digital world. In the context of NET4Age-Friendly, ecosystems consist of citizens, public authorities, businesses/NGOs, and research bodies and are supported by five working groups:

- User-centred inclusive design in age-friendly environments and communities.
- Integrated health, and pathways to wellbeing.
- Digital solutions and their large-scale sustainable implementation.
- Policy development, funding forecasts, and cost–benefit evaluations.
- Reference framework.

NET4Age-Friendly is used as a connector for involving and hosting regular themed sessions with local and regional stakeholders and users' representatives from various countries and backgrounds, as well as for fostering knowledge creation and sharing amongst researchers.

One of the joint efforts of NET4Age-Friendly was a collaborative contribution to the different areas detailed in the European Commission's Green Paper on Ageing, under open consultation until 21 April 2021 (European Commission 2021a).

The contributions were developed around specific responses to a diversity of topics drawn from the Green Paper that were considered relevant for the Action's main vision. This paper summarises some of them, along with a comprehensive addition of relevant ideas discussed in the panel session Smart Healthy Age-Friendly Environments during the 4ICAUD-2021 Conference (Web-2). The areas under analysis span themes from health to ICT, built environments, as well as integrated tourism, cultural heritage, and greener and sustainable practises and initiatives, highlighted within the context of the global pandemic context.

14.2 Selected Focus Areas

14.2.1 Health and Wellbeing Throughout the Life Course

To promote healthy and active ageing throughout the lifespan, an integrated and holistic approach for the physical and mental development of children and adults is crucial. This requires seamless cooperation between different layers of public authorities and ministerial domains, whilst the whole society contributes to fostering the many aspects of human life, from finance, ICT usage and education, to housing, food, love, tourism, and leisure. The current focus on the responsibilities and the organisation of governments and authorities is highly system-oriented and fails to consider humans at all stages of life as the key or focus point. If we are to acknowledge the importance of better involving all, leaving no one behind or excluded by society, a change of focus needs to take place.

It is essential to promote the creation and maintenance of local, regional, and national ecosystems in which all citizens, researchers, businesses, NGOs, health, and social care professionals and authorities are encouraged and aided to cooperate with each other in a safe, nurturing, and inclusive environment (Marston 2021).

Ecosystems need national and European support to be able to grow, mainly through the provision of training and coaching for their development, and of financial support for people with lower opportunities, who are less connected and who are socially and politically marginalised.

An overarching European challenge is the promotion, development, and support of ecosystems in all EU countries, which target and ensure a demonstrable involvement of citizens in their own governance and activities; only this can help to ensure participation amongst all generations and types of stakeholders.

14.2.2 Promoting Lifelong Learning—What Are the Obstacles?

For the past two decades, the social networks of most Europeans have enlarged hugely in comparison with earlier times. Social media, games, and the Internet have grown exponentially, potentially connecting everyone everywhere. “When the COVID-19 pandemic broke out earlier this year, much of the world moved online, accelerating a digital transformation that has been underway for decades. Children with at-home Internet access began attending class remotely; many employees started working from home, and numerous firms adopted digital business models to maintain operations and preserve some revenue flows. Meanwhile, mobile applications were developed to help “track and trace” the development of the pandemic; and researchers employed artificial intelligence (AI) to learn more about the virus and accelerate the search for a vaccine. Internet traffic in some countries increased by up to 60% shortly

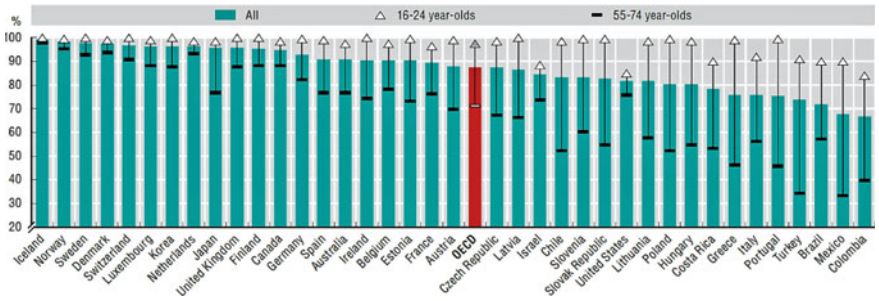

Fig. 14.1 Internet users by age as a percentage of the population in each age group, 2019. *Notes* Internet users are those having used the Internet in the last 3 months, except for Colombia and Japan (last 12 months) and the USA (any time). Data refer to 2019 except for Australia (the fiscal year ending 30 June 2017), Brazil, Canada, Colombia, Costa Rica, Japan, and Mexico (2018), and Chile, Israel, Switzerland, and the USA (2017). Data refer to age groups 16–74, 16–24, and 55–74 except for Israel (20–74 and 20–24), Japan (15–74 and 55–74). OECD data figures are based on a simple average of the available countries (OECD 2020)

after the outbreak, underscoring the digital acceleration that the pandemic sparked" (OECD 2020; Fig. 14.1).

Technology though growing at a fast pace is often unexamined through the lens of the older person or persons with diverse capabilities. Furthermore, the acceleration into this double physical/digital life, due to the pandemic, speeded up the whole process of digitalisation by 6–10 years (varying by geographical areas), as estimated recently (McKinsey & Company 2020) despite the permanence of high rates of digital gaps, indicating a renewed consciousness for the potentiality of a new "individual" resilience (Fig. 14.2).

Freedom of choice, individual autonomy, and independence are the framing keywords for this development. This was a development many embraced. However, this transformation occurred so rapidly that others were unable to follow and, in effect, got lost in this transition. The most vulnerable, especially those people with a lower income, low education, lower cognitive capacity or very old people are left on their own, rendering it impossible for them to know where to find adequate lifelong learning opportunities that keep them up-to-date and with reasonable access to full participation in society (Mestheneos et al. 2016, Age Platform Europe, Web-3). The first obstacle to adequate lifelong learning is the complexity of society, where the organisational models underpinning service provision to citizens did not keep pace with the needs.

The other most significant obstacles to lifelong learning are finances, culture, unfamiliarity and unattractiveness. Having sufficient financial means to live and support the household about participation in lifelong learning is arguably self-explanatory. In this respect, poverty in older age and due to breaks in employment, especially amongst women, often aggravates the situation. Culture and traditions, both personal and at work, may also be an obstacle in regions or nations that do not promote lifelong learning: why should one learn more than one is obliged to? "Too old to learn"

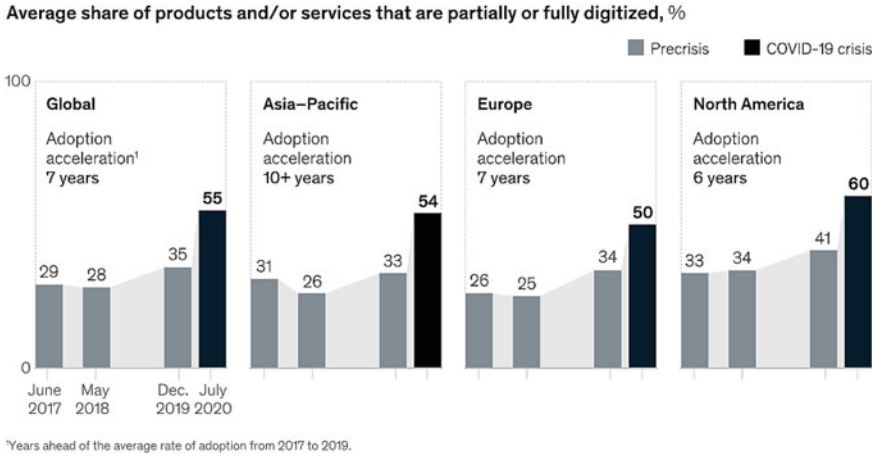

Fig. 14.2 Average share of digitalised products and/or services (%) in the pandemic, Global Survey 2020 (McKinsey & Company 2020)

is often heard. Also, in some countries, even if lifelong learning is recognised in national legislation, it is still not fully supported by adequate funding; thus, whilst the concept of lifelong learning is strongly promoted rhetorically, in reality, processes for its support and encouragement are inadequately implemented in real life.

Unfamiliarity with opportunities for learning and the perceived unattractiveness of education is the third obstacle. Many older people's learning and education opportunities were limited to their school years, long past, and they know little about the many innovative, attractive, easily accessible, and informal educational offers that have developed since then, particularly in recent decades.

Looking to the future, a lifelong approach to learning, using varied and targeted measures that reflect the variation in age ranges, is needed. Grassroots' organisations are often the most adequate and flexible bodies to provide new learning opportunities. Coaching and guidance, involving local and regional ecosystems, are a possible route towards the implementation of successful learning and training goals. In this sense, capacity building for local non-profit organisations involved in education and training as well as fostering their connections to international bodies is also necessary (Fig. 14.3).

14.2.3 Improving Participation in the Labour Market

Policy measures to support lifelong learning approaches are particularly useful in improving the capacity to work for older workers and self-employed people.

Still many consider it sufficient to go to school or University early in life and to believe that more education is not needed later. Yet, if digital skills are considered,

Fig. 14.3 Going digital integrated policy framework (OECD 2019)

continuous personal development and training are essential. There is no specific point where one can say that s/he is sufficiently digitally skilled. The 2020 pandemic forced rapid digital acceleration making permanent education, training, and support in digital skills almost essential.

One of the most relevant developments arising out of the current pandemic, which may be a permanent development, is the expansion and spread of smart-flexible-personalised work. This new trend can affect all, independently of age, physical and mental abilities, and gender.

As specific measures to promote better and higher participation in the labour market become available such as (virtual) job coaching for lifelong learning at work and home, new opportunities to stay longer in the workforce may become easier and more common. Thus, possibilities for variable time schedules and roles, an emphasis and stress on particular or unique skills, specialist expertise or knowledge, become feasible.

One significant measure for implementation that could be a real game-changer in the labour market and society is to stop general mandatory retirement ages, replacing them with tailor-made individual approaches. This should be combined with measures that provide or enforce opportunities to work at home and online, as well as resilience and mental training at work for older workers with lower skills/qualifications.

Providing opportunities to introduce different time schedules for younger and older people that consider their personal stages of life, needs, and habits could also be effective, as well offering opportunities for job diversification to enable younger and older workers to perform their jobs according to their skills and maturity. Self-steering groups of intergenerational professionals can support the distribution of tasks

and the assessment of results within the group. Fostering mutual learning between younger and older generations of workers, for example, through webinars, roundtables, workshops and other similar activities, are positive ways to allow for knowledge transfers in both directions.

14.2.4 The Silver Economy in Rural Areas and Less Economically Developed Regions

Creating better infrastructure supporting and encouraging families to stay or move to rural areas—viable for those involved in the ever-growing gig economy—is an opportunity to promote these regions and their local facilities, as being safe, and as providing better conditions both for young families and people in their mature years without grandchildren (40+). But better healthcare, education, and cultural facilities, as well as a good digital infrastructure will be vital to ensure equity in services in such areas. Job creation in areas such as energy, the sustainable and circular economy, agriculture, alternative tourism, amongst others, can also help to improve this situation and promote EU self-sufficiency.

Strengthening touristic offers in such regions and areas, linking it with innovative services that have an added value for health (thermal spas, healthy walks, healthy food, cultural attractions for cognitive stimulation, special accessible services, amongst others) but also involving local older adults in transmitting their knowledge in experiencing their localities in their in-depth meanings and original features (uses, habits, products, etc.) will all favour alternative tourism that becomes integrated to giving the real feeling of the place (Naselli 2016). This should help engage locals and increase tourism's attractiveness, off-season and in-season whilst stimulating social cohesion (European Commission 2021b).

Overcrowding is always a risk: some environmental and organisational changes are being implemented that provide the opportunity to reduce the pressure from traditional tourism flows towards "usual" destinations and their concentration during the high season. "Unusual" destinations are often hidden in rural and internal, more remote areas, which have the space and who, with resources made available from multiple sources, can make their hosting offer and SHAFE attractions, at lower prices and even in an authentic manner. Some alternative services may be shaped to bring an added value for health and wellbeing to all travellers (visits, rehabilitation programmes, adapted physical activity, personalised menus and nutritional programmes, cultural activities embedded in local communities, theatre groups, arts and crafts, volunteer work, learning opportunities for example for languages, digital tools, cooking courses with intergenerational activities). This would foster solidarity and social cohesion at local, national, and international levels.

14.2.5 Enabling Participation in Society

NET4Age-Friendly proposes ecosystem-based involvement at local and regional levels that includes all generations jointly working on the realisation of Smart Healthy Age-Friendly Environments—e.g. policy measures and legislation that should mainstream and include an assessment by people of all ages and specifically by older adults, in line with the Council Conclusions on Mainstreaming Ageing in Public Policies (Council of the EU, 2021, Web-4), that are evaluated, e.g. to be energy-neutral, to have periodic gender balance checks, amongst others.

Lifelong learning and attractive ways of remaining up-to-date with ICT developments are necessary. Traditional media could be used for this purpose, e.g. quizzes on television, or influencers (older adults) on national television to support learning, because active citizenship is no longer possible without the support of ICT tools.

A human-centred design approach is needed in terms of policymaking, bearing in mind that there are still many older adults lacking skills in using technology whilst additionally the technology is not always seen by senior adults as an adequate solution. We keep hearing that older people are not digitally literate, but will younger people be digitally literate when they age? Will the current generation of younger people remain tech-savvy for the technologies available in 20 years? And who knows what those technologies will be?

Beyond the issue of digital literacy, we also need to look at the cost of digital connectivity. For older people on pensions, often below the average wage, the cost of broadband is often one bill too many.

Furthermore, it is necessary to stress the concept of the evolution and continuously changing needs of all people as they age, as well as concepts of continuous adaptability and the personalisation of environments (housing and neighbourhood spaces, including work environments where this issue is even harder to address). The method of community participation as a tool enabling continuous feedback concerning the adaptability of the built environment is a relevant suggestion that needs full consideration.

The relationship between ageing people and the built environment is also critical, including the possibility of integrating spaces in buildings for intergenerational solidarity and reciprocal support, i.e. co-living (Coldwell 2019) or co-working practices (Tummers 2016). This is crucial especially because of future pandemics that may force us into residential spaces, but also for safety and thermal comfort both indoor and outdoor, especially as we head towards an environmental crisis that may cause extreme climate events, poorly tolerated by older people.

It is also worth mentioning that co-housing (Web-5) can be an example of a successful model that is environment-friendly and can be integrated with digitally supported services for health. Multigenerational living and housing can be a solution for single multigenerational households but multigenerational streets or multi-level apartment blocks, where people (not necessary from one family) can live and support each other are the even better option, that also promotes resilience and support within neighbourhoods.

Recognising that the needs of different ages change, co-housing might bring in technical, regulatory, and financial services to support residents. Importantly, rather than designing or developing solutions for ageing people through co-housing, co-housing itself needs to be designed by the ageing community. Co-designing experiences are much needed to explore the variety of demands of older persons. Participation ensures that their views are heard at every step of the design process (Sanders 2002). Through different well-known participatory methods, older people can express themselves accurately and in a tangible way: then designers can develop designs not only for older people's living spaces but for their health, as well as social activities, all of which benefit society as a whole. Due attention needs to be paid to retrofitting the homes and areas in which older people live, again with attention paid to older residents' needs and experiences.

Post-COVID-19 design requires a shift from adaptation implemented only with socio-health preventive measures, to the adaptation of spaces, both indoor and outdoor, to counter and prevent impacts from pandemic risks. Actions such as the functional-spatial reorganisation of housing for adaptability to social-assistance needs, as well as for new smart working methods, must therefore be associated with the transformation of public space for social inclusion safely implemented and the regeneration of neighbourhood spaces with an increase in green spaces to improve micro-climatic and environmental conditions. Outdoor spaces can play a pivotal role in providing greener, safer, friendlier, and healthier environments, enabling the active participation of communities. Small, tactical interventions at the neighbourhood scale—identifying underutilised space to reclaim—can have the potential to make a big impact on people lifestyles: road closures, speed restrictions, pop-up bike lanes, and wider pavements to create areas with more vegetation and seating opportunities can transform streets to accommodate a possible increase in cycling and walking, boosting active mobility and transforming streets into space for the community (Moser et al. 2020; Fig. 14.4).

Fig. 14.4 Progressive transformation of a street with road re-shaping around few cars and more diverse mobility, increased biodiversity, and spaces for active participation (Utopia Arkitekter 2021)

14.2.6 Reaping the Benefits from the Digitalisation of Mobility and Health Services

The digitalisation of mobility solutions and healthcare services can provide important options to reach people living in rural and remote areas. E-Health can offer long-distance monitoring, support at home, and telemedicine. The digitalisation of mobility could lead, for example, to the greater use of self-automated electric cars or drones that can deliver services and products to people anywhere, without involving personnel costs that are often the highest cost; as well as in the case of the use of automated drones, even the needs for infrastructures can be lowered, reducing another huge set of economic and environmental costs. Also, data sharing from public and private mobility sectors with the health sector could improve service organisation and accessibility, strengthening anticipatory and proactive care.

Besides digital solutions, it remains necessary to provide a broad network of centres for health, social care, basic services, and product offers.

To build such a network, it is essential to create railway connections in Europe wherever possible (sustainable, accessible, safe, affordable), instead of being still focused mainly on roads, to connect the main centres, and from there to many smaller centres at a distance, so that people can reach different places within half a day. To further connect people, sufficient public local transport facilities should also exist.

Additionally, mobile facilities, such as the mobile supermarket, mobile care centres to supply the households in rural and remote areas at a regular level, are innovative solutions in some areas that may be of help and in this sense parts of Europe can have a lot to learn from other countries, such as southern Europe, Australia, or Canada who deal with remote and long distances and have invested in solutions that can be benchmarked or adapted (WHO 2018).

14.2.7 Preventing Loneliness and Social Isolation

Due to the COVID-19 pandemic, isolation substantially increased, particularly amongst older and vulnerable citizens that were forced to be in self-isolation without live, personal communication with each other. A recent study demonstrated that the usual most fragile social categories, young adults, people living alone, people with lower education or income, the economically inactive, women, ethnic minority groups, and urban residents had a higher risk of being lonely both before and during the pandemic (Bu et al., 2020). Other scholars have indicated that the pandemic has generated a parallel "loneliness epidemic" (Khan and Kadoya 2021) as well as demonstrating an association between loneliness, increased social isolation, and pain following the COVID-19 outbreak (Yamada et al. 2021).

The creation of training centres to ensure connection through digital technologies can provide communication, stimulation of cognitive functioning and delay/prevention of advanced stages of dementia, socialisation in society and, as a result,

the mitigation of loneliness and social isolation. These training centres are relevant not only during this period of the coronavirus infection but also during the post-pandemic/interpandemic phase.

Another aspect of particular attention concerns people living a long way from cities or big villages, especially older adults. Programmes that support funding or the procuring of technical devices for those health and social workers who provide care to the rural population should be considered for support (Plan 1989).

Housing conditions can also be an important way of improving the perception of loneliness, by favouring opportunities for sharing through community spaces, collective gardens, areas for leisure activities, and spaces for socialising. Essential for limiting social isolation is the development of experimental projects for collaborative and intergenerational living that can provide an answer to the loneliness of older adults and many younger people, by intergenerational co-residence under the same roof in separate flats but sharing collective spaces, costs of utilities, food, accommodation, and home and service assistance, accounting for volunteer hours and reducing payment through subsidised rents.

Additionally, in some Member States, many older people live in long-term care facilities (LTCF) which in times of the COVID-19 epidemic represented one of the most critical types of housing, as evident in the disproportionate number of infections and deaths amongst LTCF residents worldwide. LTCF also harmed some older people's mental health, mainly due to isolation and social distancing. In this context, it is also necessary to consider whether and how appropriate architectural design can help to mitigate the spread of infections, whilst at the same time enabling older people to live in dignity and with a minimum of social exclusion.

14.3 Conclusion

NET4Age-Friendly recommends and supports, through its network, the creation and maintenance of local, regional, and national interconnected ecosystems in which all citizens, researchers, businesses, NGOs, health, and social care professionals and authorities are enabled to cooperate in a safe, educative, inclusive, and mixed social environment.

These human ecosystems need national, over national, and European support to be able to grow, mainly by providing training and coaching for a more suitable development, as well as financial support enabling the involvement of fragile people with much lower opportunities. The role of the European Commission is key in supporting different elements of such ecosystems and relevant initiatives. Cooperation between the different layers of public authorities as well as the different society actors ensures that no one is left behind.

The promotion of healthier lifestyles throughout the lifespan makes an integrated and holistic approach to the physical and mental development of children, adults, and seniors crucial. Training opportunities, joint learning of skills regarding healthy lifestyles for all ages, friendly ICT usage, adequate housing and independent living,

well-maintained and safe indoor and outdoor places and spaces, as well as safe circulation pathways for daily needs have become key areas for action, along with financial security, online connectivity, accessibility, and inclusiveness for all.

Opportunities provided to citizens, especially older ones, to work as local communities' members and in public and volunteers' organisations; to have concrete ways of communicating with the city public administration; low threshold opportunities to meet, including more diversity and different levels of activities are all examples of the call to provide sufficient support and guidance to people to remain connected in the society, with a major focus on the fundamental rights of people in the EU, including older adults. Strengthening the culture of living labs, as places where citizens contribute to valuable activities, also involving and connecting the younger with the older generations is a key aspect needing further implementation.

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Chapter 15
Architectural Research Methods to Investigate Older People's Social Isolation

Rosana Rubio Hernández and Fernando Nieto Fernández

Abstract Recently, attention has been paid to loneliness and social isolation among older people. Solutions to both global phenomena, aggravated by the outbreak of the coronavirus disease in the context of an ageing population, require multidisciplinary research at different levels. One such body of research, called 'AIsola,' aims at investigating social isolation among older people using expertise from research groups in architecture, social psychology, gerontology, and AI technology. The project uses as case studies four centres for older adults operated by the same service provider in the metropolitan area of the city of Tampere in Finland. Based on recent research on the use of AI solutions to detect and predict older people's loneliness and social isolation, researchers are conducting mixed-method research including two complementary studies. The first is a technological study using AI-based wearable sensor technology to detect and predict social isolation of older adults living independently and regularly visiting the care facilities. The second is an empirical study of the spatial and social contexts of the same people. The research questions are: what are the context-related factors that affect social isolation at the scales of the city, the neighbourhood, and the building? What are the measures that potentially prevent social isolation of older adults by hybridising spatial-social and technological aspects? This paper describes the research methodology used by the architectural sub-group for the AIsola project. The methodology is a combination of: (1) observational studies of spatial settings based on physical and experiential parameters and (2) drawing-based analyses that use mapping and architectural ethnography as research tools. As a methods paper, the objective is to describe the ways in which an ongoing architectural investigation is being carried out, with the ultimate goal of defining the role of architects and research in architecture in solving the major societal challenges related to a post-COVID ageing population.

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Keywords Social isolation · Older adults · Ageing society · Technology · Built environment · Architecture · Architectural research methods · Architectural ethnography

15.1 Introduction

People can experience loneliness and social isolation at any stage of human life, but recently, attention has been given to these issues among older adults in particular. This is because, according to statistics, "the share of global population aged 65 years or over is expected to increase from 9.3% in 2020 to 16.0% in 2050" (UN 2020). One of the reasons why living alone later in life is a strengthening global trend is the fact that life expectancy is increasing while fertility is decreasing (Jamieson and Simpson 2013). Intergenerational living arrangements have also declined significantly; today, most older adults live in single-person or couple households (Ruggles 2007). In Finland, the number of people living alone, particularly those aged 70–74, has grown in the last 10 years. In 2019 there were 55% more people than in 2009 who belonged to this age group and who lived alone (Web-1). The issues of loneliness and social isolation intensify later in life as a result of multiple factors, including socio-economic and health circumstances. Further, the situation for this high-risk population has been aggravated due to the necessary physical isolation measures and restrictions on social interactions imposed by the COVID-19 pandemic (Luchetti et al. 2020).

A widely used definition of loneliness refers to a subjective perception of an undesirable gap between actual and desired social relationships in terms of their quantity or quality; social isolation refers to one's quantity of social relationships and describes the objective lack of social contacts and integration with the social environment (National Academies of Sciences 2020). Among the variety of interventions aiming to address human loneliness and social isolation, recently, partial solutions have been sought from the field of information and communication technology (ICT).

This methods paper describes an architectural sub-study within a multidisciplinary research project that addresses one possible intervention within the field of ICT. The two-year project, ongoing at Tampere University, is titled "Implementation of contextual complexity in AI-based assessment systems of older adults' social isolation" (AIsola). First, the paper defines the state of the art in this area of research. Second, it gives an overview of the AIsola project—describing its consortium and workflow, outlines research questions, and briefly explains the case study used to answer them. Third, the text focuses on the methodology used for the architectural sub-study, elaborating on the conceptual and theoretical framework on which it is based and delving into the two complementary methods adopted: one based on mapping and the other with a basis in architectural ethnography. The paper concludes by advancing the goals pursued with the described methodology.

15.2 State of the Art

Research on technological interventions to assess older adults' living environments in general has been framed by the fields of technology, health, and social sciences or a combination thereof (Buffel et al. 2018), or by the field of urban planning (Chao 2017). Empirical research examining how the built environment affects individuals' social life, however, is scarce (Mouratidis 2018). While the study of social isolation in older adults has been a priority in the gerontology domain, more recent research on the topic has expanded to include urban and regional planning. Such research has focused on elements ranging from the physical form of communities, mobility, and access to facilities to natural outdoor spaces and common activities carried out to increase social interaction.

Similarly, recent studies have assessed the influence of building characteristics and typologies on social isolation and loneliness. However, this research was performed in silos despite the fact that the complexity of the topic calls for an integrative approach (Suen et al. 2017). Nonetheless, there are instruments of environmental evaluation that can be used to measure older adults' living environments, some of which integrate socio-psychological and physical variables both at the urban and building scales (Kane and Kane 2000).

However, there are no scales for evaluating the impact of the living environment on loneliness and social isolation specifically. In this regard, the AIsola project faces a series of methodological challenges to bridge the gaps between the different disciplines involved. The aim of the project is to advance a methodological approach towards a more comprehensive understanding of the phenomena at stake, bringing to the front architectural research methods—a novelty in the current panorama. This approach includes methods that range from observational studies to spatial analyses of architecture and urban spaces based on drawing techniques and visualisations.

15.3 The AIsola Project

AIsola is a multidisciplinary project addressing older adults' need for social contact based on the results obtained in a systematic literature review, in which the authors participated, entitled, "Older Adults' Loneliness, Social Isolation and Physical Information and Communication Technology in the Era of Ambient Assisted Living: A Systematic Literature Review" (Latikka et al. 2021). The term 'physical ICT' refers to social robots,wearables, and smart homes that hold potential value for addressing the issues in question. The review compiled two differentiated areas of research on older adults' loneliness and/or social isolation: one focused on their 'alleviation' and the other on their 'detection and prediction.' AIsola concentrates on this second area, which relates to the capacity of artificial intelligence (AI) systems to 'detect and predict' the phenomena of loneliness and isolation based on older adults' behavioural patterns.

The review of studies on AI detection and prediction revealed that while the methods used for research purposes have a lot of potential, they are still insufficient, in two ways. First, AI studies looked at detective and predictive systems of both social isolation and loneliness. To detect and predict loneliness contradict the academic consensus that "loneliness is an experience that is identified by individuals themselves and is not something that can be identified or observed by others" (Victor 2021). To avoid this contradiction, AIsola excludes loneliness from its research. Second, the existing studies did not take into consideration the socio-spatial characteristics and conditions of older adults' living environments; AIsola addresses the issue from a multidisciplinary perspective to contribute overcoming these research gaps.

15.3.1 AIsola Consortium, Workflow, and Research Questions

The project combines expertise from the disciplines of architecture, social psychology, gerontology, and AI technology (from the fields of mechanical and electrical engineering). Based on the above-mentioned research on AI solutions to detect and predict older adults' social isolation, researchers are conducting a mix-method empirical investigation including two complementary sub-studies: (1) a technological study using AI-based sensor technology to detect and predict social isolation of older adults living independently and regularly visiting care facilities and (2) a study based on the socio-spatial perspectives of these older adults' contextual conditions. The project aims to combine the results of each sub-study using the centre of the society-technology spectrum as a bridging area (Fig. 15.1).

The project will respond to the following research questions: (RQ1) what are the context-related factors that affect social isolation at the scales of the city, the neighbourhood, and the building? (RQ2) What are the measures that potentially prevent social isolation of older adults by hybridising spatial-social and technological aspects?

15.3.2 Case Study

Simmons (2009) states that the case study method allows for researchers to study a topic in-depth and interpret it in specific socio-political contexts. It also has the potential to engage participants in the research process, recognising the importance of co-constructing perceived reality through the joint understanding of researchers and the other actors involved in the experience. For these reasons and given the nature of the phenomena of social isolation and loneliness, a case study methodology was adopted for the present research.

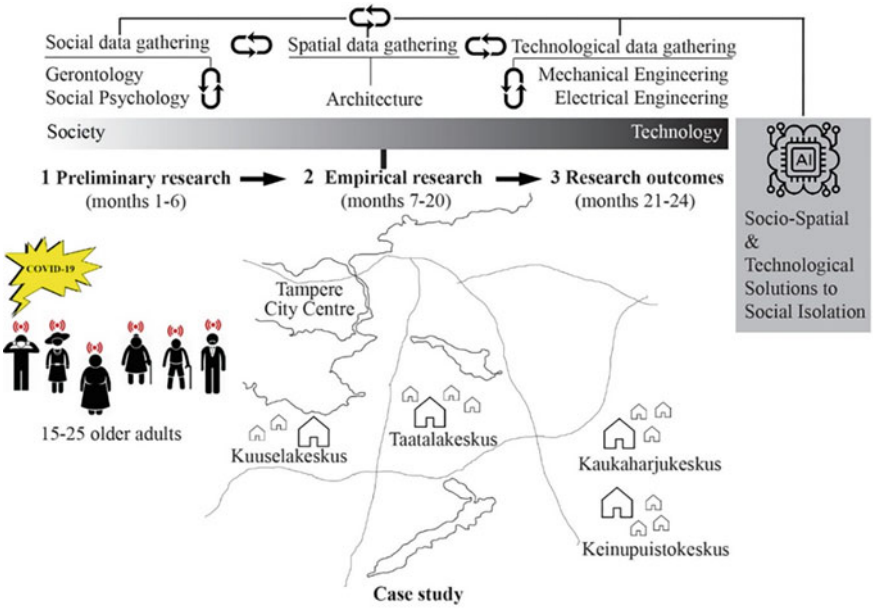

Fig. 15.1 Conceptual diagram of the AIsola project. Drawing by the authors

The project is using as case studies four assisted living centres (Kuuselakeskus, Taatalakeskus, Kaukaharjukeskus, and Keinupuistokeskus) managed by the company Sointu Senioripalvelut (Sointu hereinafter), which provides services for older adults in the metropolitan area of the city of Tampere in Finland. Sointu owns several assisted living facilities and provides people living in the neighbourhood with premises for meeting and attending social activities (a concept known as *lähitori*), a service which is commissioned by the City of Tampere. In this project, the focus is on people who move about and around the premises and who live in the neighbourhood, but who are regular visitors to Sointu's facilities where they participate in the activities provided. Thus, adults with advanced dementia are excluded, since their mobility capacities are severely reduced due to their impairment. Fifteen older adults are currently participating as volunteers from whom empirical data are being gathered; the research team intends on recruiting at least ten more individuals for a total of 25 participants.

A range of methods is being adopted by the different sub-teams to assess the case. The electrical engineering and the mechanical engineering sub-groups are addressing the questions quantitatively by tracking older adults' daily routines with wearables and sensors placed within the facilities. They correlate daily routine patterns with the quantitative measure of each participant's level of social isolation, aiming at designing an AI system that detects and predicts social isolation. The social-psychological and gerontological sub-groups are utilising qualitative methods in the form of semi-structured, face-to-face interviews and walkthrough interviews.

McKee et al. (2002) suggest that mixed qualitative methods are the best way to assessing extra care living environments. The methods used by the architectural sub-group are described in detail in the following sections of this paper. Finally, a triangulation method is being adopted throughout the research process to integrate and combine both quantitative and qualitative data to ensure that data are analysed comprehensively and reflexively (Pope et al. 2000).

15.4 Architectural Sub-study Methods

15.4.1 Theoretical Frameworks and Indicators

The architectural sub-group is developing a tool to evaluate and record the influence that the living environment exerts on volunteers' social isolation. The procedure is backed by a series of theoretical frameworks:

On the one hand, a number of indicators have been identified as potentially related to older adults' social isolation based on the following conceptual frameworks and indexes: (1) the World Health Organisation's concept of 'age-friendly cities' (WHO 2015) and its interpretation by the City of Tampere (Moisio and Nurmio 2018); (2) the United Nations Economic Commission for Europe's 'active ageing index' (UNECE 2019); and (3) the 'sense of place' concept (Trentelman 2009).

The first two indicators derive from research studies stating that social isolation and perceived loneliness are inversely proportional to the activity level of individuals (Schrempft et al. 2019). In terms of the third, 'sense of place' concept, privacy, aesthetics, place identity, and place dependence are analysed as they relate to people's psycho-social conditions.

On the other hand, a parallel approach to the other sub-groups operating in the AIsola project has been adopted; thus, the ethnographic component of human habits is being brought to the foreground as a means of elaborating on the contingencies and specificities that human activities entail in relation to the built environment. There exists a broad body of theoretical work related to architectural ethnography as a research method, which by the mid-twentieth century meant contesting modernism from a revisited humanistic perspective. Recent work in this realm includes, for instance, work by the Japanese architecture firm Atelier Bow-Wow (Tsukamoto and Kaijima 2007; Sigler and Whitman-Salkin 2017). The architects, in their compelling visual books, graphically unfold their concept of 'ecology of livelihood,' using a series of figures, objects, and actions that coexist with construction details, implying the entanglement between human behaviour and the built environment—which directly relates to the AIsola project's aims.

15.4.2 Methods and Data Sources

The methods adopted by the architectural sub-group consist of a combination of observational walkthroughs and design method research. The walkthrough method permits researchers to systematically assess multiple aspects of the spatial settings based on physical and experiential parameters (Blakstad et al. 2008). It also reveals the complexity of the subjective experience, helping to understand volunteers' spatial experience (Pierce and Lawhon 2015) and to enable a comparison between perceived and objective environmental factors (Jia and Fu 2014). Some existing evaluation protocols will be adapted to the social isolation issue in question (see Kane and Kane 2000). The documentation, analysis, and synthesis of the data gathered through the walkthroughs are being done using drawing-based techniques.

Based on the conceptual framework described above, two drawing methods will be used to assess the case study:

1. 'Mapping.' The identified indicators are depicted at three scales: (a) the city and neighbourhood; (b) the surrounding area of the Sointu premises; and (c) the building scale. There will be two sets of maps from each category. One is based on the architectural sub-group analysis, which will yield an overall picture of the built environment. The other set of maps will trace the volunteers' data provided by the rest of the team, which includes the quantitative measures tracked through technology, as well as the subjective perception of the indicators we have identified by the volunteers gathered in the interviews.
2. 'Architectural ethnography.' A series of scenes following architectural ethnographic methods will be depicted. The selected scenes will be composed based on the information resulting from the combination of data collected in the social, technological, and architectural sub-studies.

Data will be gathered from all or some of the following sources, depending on the drawing method and the scale of the map: the City of Tampere provides the maps of the city and neighbourhood; Sointu provides the blueprints of the premises and the schedule of monthly activities; and the AIsola sub-studies provide data from technological tracking of indoor and outdoor activities, interviews, and observational walkthroughs.

15.4.3 Mapping

Data will be depicted in two-dimensional floor plans at three scales:

(a) The city and neighbourhood at a 1:5000 scale. The aim of mapping the Sointu premises in their extended context is to understand and visualise the relationships of the facilities with the physical and service infrastructures that relate with the older adults' social isolation. Two main aspects are being assessed:

(a.1) mobility (lines of transport, pedestrian walkways, and bikeways) and (a.2) services located in the area (facilities and green and blue areas).

(b) The areas surrounding Sointu premises at a 1:500 scale. The goal of mapping the area near the facilities is to analyse its influence in older adults' daily lives. Five main aspects are being recorded: (b.1) vehicular mobility; (b.2) pedestrian mobility (walkability, accessibility, and safety issues); (b.3) aesthetics and identity (positive and negative impacts and Kevin Lynch's elements responsible for the image of the city, i.e. landmarks, paths, nodes, edges, and differentiated areas in the neighbourhood); (b.4) phenomenological aspects (acoustic, visual, and thermal qualities); and (b.5) outdoor space usability.

(c) The buildings at a 1:200 scale. Five aspects are registered: (c.1) the degree of privacy and communality of the different spaces in the building; (c.2) aspects such as the dimensions, capacity, and levels of flexibility and adaptability to different activities; (c.3) location of the spaces in the building dedicated to activities related to active ageing (employment, participation in society, independence, and healthy and secure living); (c.4) the same phenomenological indicators referred to in the areas surrounding Sointu premises; and (c.5) space usability.

15.4.4 Architectural Ethnography

The method based on architectural ethnography is more speculative in comparison to the mapping method described above. Although there is already a body of work using this method in architecture, it is still being explored and defined for use in multidisciplinary research projects like AIsola. The method consists of observing and recording architecture and urban space from the viewpoint of the people using it, in this case the 15–25 volunteers participating in the empirical study. This way, a human-centred component is introduced into the analysis, as well the qualitative aspects that imply human–environment relationships.

The scenes are elaborated as follows: two-dimensional vector drawings (in floor plan and elevation), at a 1:50 scale, are used to analyse concrete situations and depict an idealised architectural or urban setting—thus intentionally incorporating architectural design into the process. The meaningful situations to be depicted are being detected through the socio-spatial and technological sub-studies and according to their potential to overcome social isolation. The human figures to be represented are inspired by the actual volunteers, but do not correspond exactly with the characteristics of their physical profiles; i.e. they are anonymised to comply with ethical requirements. These illustrative drawings act not only as research tools but also as communication tools to broader audiences.

The following describes one of the scenes that has already been detected and that is starting to be represented: The Dial-a-Ride scene (Fig. 15.2) shows a service focused on extending the autonomous and independent lifestyles of older adults. It is a customisable minibus service that takes people from their homes to do shopping in

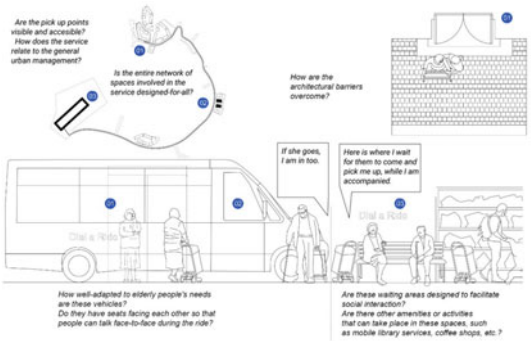

Fig. 15.2 Dial-a-Ride service. Drawing by the authors with K. Psegiannaki and F. García-Triviño

the company of others, picking them up, and dropping them off at home again. This way they can socialise during the journey, during the act of shopping, and while they are waiting for the minibus. This daily routine is represented in the drawn scenes through the proposal of idealised architectural settings (Luoma-Halkola and Jolanki 2021; Psegiannaki et al. 2021).

15.5 Conclusion

This paper aimed to describe the architectural methods that are being employed to partially address the AIsola project's research questions. The goal has been to define the role of architects and of architectural research methods when addressing topical phenomenon-based research—in this case, social isolation of older adults. Likewise, the paper has stressed the need for designing multidisciplinary, interdisciplinary, and transdisciplinary research methods to assess this multifaced phenomenon. The paper has also described an evaluative framework to assess the influence of the built environment and outdoor space on older adults' social isolation, bringing to the front architectural research tools based on drawing techniques as integrative instruments of the data gathered by the different sub-studies.

The architectural ethnography method proposed is the most purposeful and challenging contribution of the architectural sub-study. Thus, this methods' paper has meant to contribute to an evolving field, which, as it develops, would yield new types of drawings that describe different aspects of the interplay of people and the environment, including those that influence social isolation of older adults. The architectural sub-study aims to contribute to and enrich a specific architectural research tradition that pushes human behaviours to the foreground of design enquiries, using architectural drawing as the driving tool. These kinds of drawings are revealing instruments of the socio-political 'sub-text' that underlines architecture. They are also communication tools that reach across disciplines and sectors, because although they can depict the specificity and complexity of uncountable human situations, they are still accessible via a conventional visual language.

All in all, the resulting drawings facilitate communication with both the research sub-teams and broader audiences, including the older adult project volunteers, the service provider Sointu, and City of Tampere policy makers. Moreover, the architectural methods described herein aim to advance knowledge to bridge disciplinary silos. They achieve this by providing the means to analyse, synthesise, and advance proposals for the improvement of building context in terms of social integration of older adults after COVID-19 pandemic, to contribute achieving a *new normality* in their lives.

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Chapter 16
The New-Normal Education Model in Architecture: Digital Deconstruction

Serap Durmus Ozturk

Abstract This paper aims to initiate discussion about the digital deconstruction of architecture as an education model in architecture. This begins by briefly outlining the architectural education and Covid-19 pandemic. Then, the relationship between deconstruction and architectural thinking is discussed in how it relates to education and, more specifically, discourse and representation of architecture. There is then a short literature review about the deconstruction theory and binary oppositions. The conclusion presents the objective, scope, definition, and method of the problem at the conceptual level using students' digital works from the 'Architecture and Deconstruction' elective course. Jacques Derrida's binary oppositions, which are used as a tool of conceptualization, have become an important tool that allows the exemplification of deconstruction theory in architecture. In conclusion, the paper aims total of 148 digital representations (79 images in buildings-spaces title and 69 images in portraits-bodies title) which are an indication that another experiences and new discourses are possible in architectural education through digital data.

Keywords Architecture · Jacques Derrida · Binary oppositions · Digital deconstruction · New-Normal Education · Distance education

16.1 Introduction

The Covid-19 pandemic, which started in the second half of 2019 and affected almost the whole world at the beginning of 2020, has affected all areas of life and daily life. As in every field, this effect is also reflected in architectural education. The discipline of architecture, which has been constantly changing and transforming throughout history, has witnessed different examples of developing new methods in education during the Covid-19 pandemic. Face-to-face architectural education has now had to be done online. Before the pandemic, distance learning in architectural education

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was an activity that did not find widespread practice beyond a few attempts. The distance education, which is not fully structured in architectural education, had to be implemented in almost all schools with the pandemic. In the new normal process after Covid-19, a new era has begun in education and teaching architecture in front of the screen, as in every field. Course syllabuses have been revised and new initiatives have begun to be implemented in order to catch up with the era and to evaluate the conditions we are in.

Modern architectural education needs to be restructured to facilitate and improve how students learn the curriculum (Sagun et al. 2001). Creativity and creative processes are related to problem-solving as well as problem definition, and concept generation/conceptualization is a crucial part of these processes (Williams et al. 2010). Concepts and conceptualization sometimes constitute the beginning and sometimes the whole process (Durmus Ozturk 2020). In this context, this paper, which examines the forms of generation of architectural knowledge with a deconstructive approach, deals with examples of digital representation that support the creative process on the axis of architect-architecture. The claim that digital representation supports the creative process within formal and informal studies is of central importance in the creation of data supporting the forms of knowledge production in architectural thought.

This paper is about the distance education model applied in the course called 'Architecture and Deconstruction' which is conducted as an elective course in the 7th term at Karadeniz Technical University (KTU), Department of Architecture in the 2020–2021 Fall semester (Durmus Ozturk 2021). The 'digital deconstruction of architecture' theme created within this framework aims to rethink and question architecture by turning the pandemic into an advantage in all relevant areas of architecture.

16.2 Deconstruction and Architecture

Design in architecture is an act of transformation, and in that sense, it is the highest form of practical adaptation to our environment. It is also a form of communication in which constructs, concepts, and mental pictures of reality existing in the mind of the designer are transformed into visions of future realities via the language of architectural composition (Durmus and Oymen Gur 2011). Based on this view of architecture, for any architectural work to be distinguished as creative it must transform, must cause a change in the environment.

Deconstruction philosophy can be seen as a way of realizing this change of perspective in architecture. The word deconstruction, used by Derrida for the first time in the book 'De La Grammatologie', refers to a process of exploring the grounds of Western thought in their essence (Durmus 2009). Deconstruction as a strategy of questioning and an approach for critical thinking establishes meaning through mutually functioning concepts and reversals of logic.

Deconstruction as a strategy of critical analysis, in translations from French of the works of philosopher Jacques Derrida (1930–2004). The word was used in English in a literal sense of building and architecture, 'a taking to pieces', the logic of change that exists in the word deconstruction, that is the logic of both separating and combining, also comes from the structure of the word (Web-1 2021). According to David Carol, deconstruction involves the rethinking of the object, which is the most important and fundamental component (Benjamin 1988). For Norris (1988), it is not only a way of strong philosophical ideas, but also of ideas that are tried to be strengthened. Derrida, on the other hand, says, '…deconstruction in architecture occurs when certain architectural philosophies and assumptions are deconstructed' (Collins 2005, p. 123).

The deconstruction method, however, is based upon analysis via deconstructivist concepts; it seeks to put forward the existing signs of creativity with traces (Gur 2008). For this reason, creative buildings—also their representations—belonging to the past can be deconstructed critically. The creative steps extrapolated via the terms of deconstruction make up the sub-questioning and investigation paradigms of the deconstruction method.

16.3 Objective and Scope

This paper's main objective is to question how architectural education is affected by changing conditions. For this purpose, 'Architecture and Deconstruction' elective course conducted with 7th term students of Karadeniz Technical University (KTU) Department of Architecture in the 2020–2021 Fall semester was carried out with one lecturer and 45 students. In the face-to-face education before Covid-19 pandemic, all outputs of the course were 3D model representations. Two-dimensional outputs were prepared with traditional representation technics, and 3D models were emphasized. In this context, after Covid-19 pandemic, based on the deconstruction theory of the French philosopher Jacques Derrida and selected by the students, binary oppositions were used as a tool to create digital representations about deconstructionist architects and deconstructivist architecture. A total of 148 digital representations with their discourses are an indication that another experience is possible in architectural education through digital data.

The course supports that the relationship between deconstruction and architecture includes creativity. The creativity in question turns into a visible representation with the help of digital possibilities. In the course held in front of the screen and through the use of digital opportunities within the pandemic, students used various techniques such as collage and photomontage with digital interface possibilities. Thus, the course aims to be a new example of education model in architecture.

16.4 Definition of the Problem and Method

Design plays a central role in any discipline engaged with the act of design as a process to lead to absolute as well as ambiguous arrangements of ideas, at times with an intuitive, and at others a rational basis for the ideas (Lawson 2006). That is why it had always entailed the potential to think about an interdisciplinary act. At the intersection of architecture and philosophy, deconstruction theory includes creative perspectives that support the use of concepts and the generation of ideas when considered in the context of creativity and representation. Therefore, the concept refers using metaphor and analogy as Lakoff and Johnson (1980) suggested. They also stated that the thinking process is a major aspect of a conceptual system and structured metaphorically. Although the concept of metaphors is used to distinguish, experience, and understand something, analogies are defined as conceptual structures that show certain systematic similarities between two types of source as a way of describing conceptual content (Oxman 2004, p. 69). Creativity is effective in both the production of concepts based on abstract thinking and in the completion of the design process in original ways.

The existence of studies on the relationship between the architecture and deconstruction, in the literature serves as proof that interdisciplinary relationships can offer a viable method in architecture education (Dutton 1991). For this purpose, 'Architecture and Deconstruction' course defines the problem that the way of developing ideas and concepts via Jacques Derrida's binary oppositions. At the beginning of the term, seven deconstructionist architects—Peter Eisenman, Frank O. Gehry, Zaha Hadid, Wolf Prix and Helmut Swiczinsky, Rem Koolhaas, Daniel Libeskind, Bernard Tschumi—were presented to the student groups for selection (Fig. 16.1). In groups that chose their architect after their research, the students were asked to engage in research on the topic, for a period of four weeks, and choose their appropriate binary opposition. The whole process was shared with the students in 5th week of the term (see course syllabus).

In the first half of the 14-week period in seven lectures, theoretical information (meaning, linguistics, semiotics, theory, Jacques Derrida, binary oppositions, and digital art) were carried out. In the remaining half, presentations and report submissions to seven deconstructionist architects were carried out as a group. A digital pool

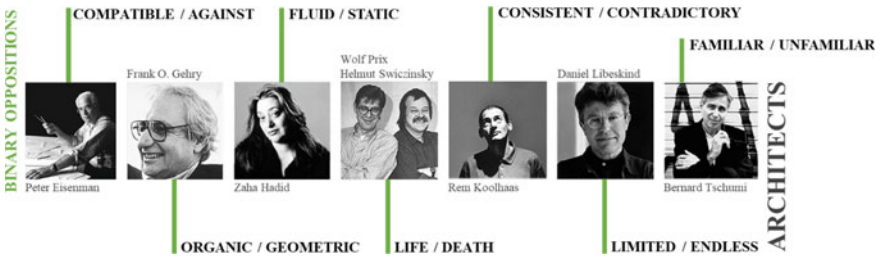

Fig. 16.1 Deconstructionist architects and binary oppositions (*source* author)

was created by making individual digital representations of classroom every week in addition to group members. During the evaluation week, all the data were opened to public discussion on the zoom and the advantages of being present and join online and contacting the data with more audiences were benefited from.

Course Syllabus and Content

Theme: Digital Deconstruction of Architecture.

Subject: Deconstructionist Architects and Architecture.

Workspace: 20 cm × 20 cm square size digital paper, 300 dpi.

Material: Digital paper, Photoshop, and all photo editing programs.

Preparation before presentation: Identify and share your binary opposition. Prepare the digital design conceptual report.

Problem: Create a deconstructive digital production by considering the deconstructionist architect and the given binary opposition, which is the subject of the week. While making your production, you should choose a working base (portrait, building photos, sketches, plans, sections, views, two-dimensional or three-dimensional drawings, etc.).

Digital representations and presentations: Share your digital data with all students and audience outside the classroom on zoom.

Implementing a method based on and attaching significance to data, the course process uses portraits-bodies and buildings-spaces to discover the maze the students' imagination often is. In this context, deconstruction is an interface to put metaphoric contexts to concrete intellectual and formal grounds with digitally.

16.5 Digital Deconstruction

The digital deconstruction method uses Derrida's binary oppositions as a tool. All digital data created with seven deconstructionist architects—Peter Eisenman, Frank O. Gehry, Zaha Hadid, Wolf Prix and Helmut Swiczinsky, Rem Koolhaas, Daniel Libeskind, Bernard Tschumi—are presented by grouping them under the titles of buildings-spaces and portraits-bodies. The digital data selected in title have been interpreted collectively through the discourses and representations produced for each digital by the students. In this context, the binary oppositions have become an important tool for the production of digital representations in terms of content and form.

Fig. 16.2 Digital representations for Peter Eisenman: buildings-spaces and portraits-bodies (*source* author)

16.5.1 Peter Eisenman with Compatible-Against Binary Opposition

Peter Eisenman has devoted his career to decomposing architectural forms into theoretical science. Eisenman adopted the deconstruction as a philosophical starting point, that is, he adopted an architectural idea based on deconstructing and reassembling what has been done. However, this deconstructing does not represent destruction; on the contrary, it represents bringing harmonious, unitary, balanced, and stable values to the buildings. Eisenman, who was invited to the MoMA exhibition with the Wexner Center for the Arts, the first major public building opened in 1989, offered a questioning perspective to the basic problems of architecture with the presence of overlapping and dislocating grids.

Digital representations in Fig. 16.2 are evaluated in the context of Compatible-Against binary opposition; it is seen that the digitals under the title of buildings-spaces mostly refer to the Holocaust Memorial, Wexner Center for the Arts and House VI buildings. In the examples of deformed or completed buildings, the compatible-against binary opposition is emphasized through the concepts of grid, deformation, presence-absence, and memory. In the digital representations under the title of portraits-bodies, the idea of a grid with reference to different buildings of the architect is conceptually and formally dominant. The portrait and body of the architect are in, in front of and above buildings, both compatible and against examples with deconstructing and reassembling.

16.5.2 Frank O. Gehry with Organic-Geometric Binary Opposition

Frank Gehry architecture is not an architecture in which a conscious philosophical message is sought and reflected, but a search for a free identity and expression without

Fig. 16.3 Digital representations for Frank O. Gehry: buildings-spaces and portraits-bodies (*source* author)

fear of personalization and mobility. The most important deconstructionist feature of Gehry, which maintains his timeliness by always renewing himself and being able to switch between different architectural styles, is his uncertainty.

One of the works that Gehry sent to the Deconstructivist Architecture Exhibition and completed in 1978, the project of his own house drew attention with its exploding masses and different uses of materials, unlike the traditional texture. He has surrounded the exterior of his house with new linear shiny layers unlike the original material. Gehry took his place in the MoMA exhibition with his disruptive attitude toward the house, which is one of the main problems of architecture.

Digital representations in Fig. 16.3 are evaluated in the context of Organic-Geometric binary opposition; it is seen that digitals under the title of buildings-spaces mostly refer to the Walt Disney Concert Hall, Lou Ruvo Center for Brain Health and Dancing House buildings. In the examples of buildings created with organic lines and presenting a complex image, the binary opposition of organic-geometric is emphasized through the concepts of curvilinear-straight lines, rupture, undulation, incomplete grid, and reflection. The deformed forms and surfaces in the representations came to the fore with surrealist descriptions. The idea of emphasizing the organic-geometric coexistence of the architect with reference to different buildings is conceptually and formally dominant in the digital representations under the title of portraits-bodies. The portrait and body of the architect are such that they approach or tangent to the buildings, are over or inside the buildings, but generally have an organic fusion with the buildings.

16.5.3 Zaha Hadid with Fluid-Static Binary Opposition

Zaha Hadid, who breaks the integrity of the architectural features that make up a building by removing the boundaries between interior and exterior with her architectural works; surface plays, shifting the facade, and style signature curves and waves bring her buildings to life.

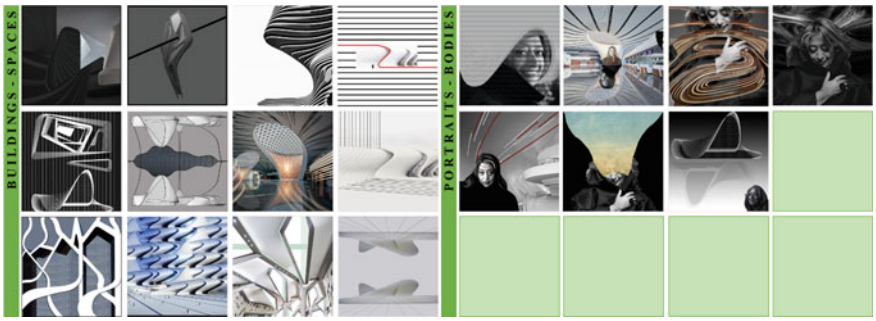

Fig. 16.4 Digital representations for Zaha Hadid: buildings-spaces and portraits-bodies (*source* author)

Zaha Hadid's style that integrates with topography and interior spaces stands out in The Peak (1983) project, which is located on top of a hill where she was invited to a Deconstructivist Architecture Exhibition in MoMA. With the project, which consists of three independent horizontal blocks and spatial spaces between the blocks, Hadid reinterpreted the relationship between the building and the land and deconstructed it.

Digital representations in Fig. 16.4 are evaluated in the context of Fluid-Static binary opposition; under the title of buildings-spaces, digitals are mostly created through the reproduction of surfaces, lines, and planes; it is observed that the architect gave strong formal references to buildings such as the Riverside Museum, Wangjing Soho, and London Aquatics Center. In the digital works under the title of portraits-bodies, the binary opposition comes to the fore with lines and movements, while the portrait of the architect is diversified around the themes of line and movement, which constitute the main scene of the digital, instead of being on or inside the buildings. In digital representations, the category of portraits-bodies was quantitatively less represented than the category of buildings-spaces.

16.5.4 Wolf Prix and Helmut Swiczinsky with Life-Death Binary Opposition

Wolf Prix and Helmut Swiczinsky seek movement and dynamism between interior and exterior. However, this search represents new interrogations instead of destructive or aggressive destruction. Coop Himmelb(l)au, the architectural office by Prix and Swiczinsky, sent three different projects representing these questionings to the Deconstructivist Architecture Exhibition. Rooftop Remodeling Falkestrasse (1988) project, which they made for an apartment in the city center of Vienna, drew attention with its impressive wing-shaped form and open structure. The building defined a different and complex relationship both spatially and structurally.

Fig. 16.5 Digital representations for Coop Himmelblau: buildings-spaces and portraits-bodies (*source* author)

Digital representations in Fig. 16.5 are evaluated in the context of Life-Death binary opposition; it is seen that the digitals under the title of buildings-spaces mostly refer to the Apartment and Office Building Schlachthausgasse, Falkestrasse Roof Design, Museum of Contemporary Art and Planning Exhibition, and BMW Welt buildings. The chaotic atmosphere evoked by the life-death binary opposition can be seen in digital representations. It is seen that architectural elements such as stairs and roofs are also used in digital representations. On the other hand, in the digital works under the title of portraits-bodies, it has been seen that the architects take place together, and the portraits of the architects are used purely beyond the spaces. As the architects say, spaces are like a heartbeat, so the opposite ends defined by binary opposition are represented by faded and mirrored visuals.

16.5.5 Rem Koolhaas with Consistent-Contradictory Binary Opposition

Rem Koolhaas is known for his works in the field of architectural philosophy as well as architectural practice with his sensational discourses and projects that are called threatening. For Koolhaas, the conservative architectural view is troubling and should be up for debate. His work known as Boompjes (1980) was included in the Deconstructivist Architecture Exhibition and the project was featured in the MoMA exhibition with visual materials, perspective and axonometric drawings.

Digital representations in Fig. 16.6 are evaluated in the context of consistent-contradictory binary opposition; it is seen that digitals under the title of buildings-spaces mostly refer to CCTV Tower, Seattle Central Library and Galleria buildings. Provocation evoked by the consistent-contradictory binary opposition; it takes place in digital representations with the presence of exploded, reassembled parts. On the other hand, the architect's CCTV Tower building stands out in the digital works under the title of portraits-bodies. In digital representations, the use of not only the portrait of the architect, but also the use of his whole body in association with his buildings

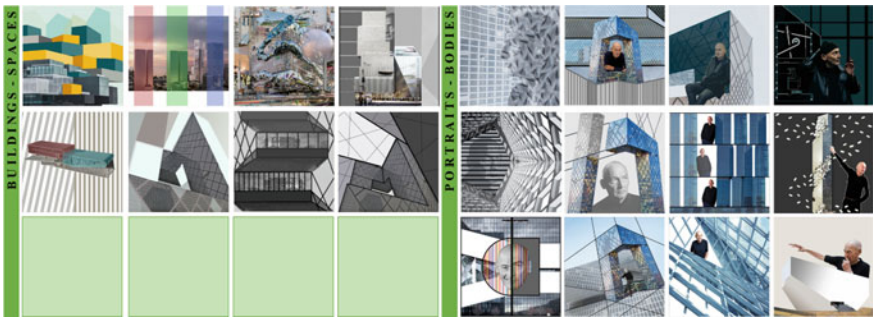

Fig. 16.6 Digital representations for Rem Koolhaas: buildings-spaces and portraits-bodies (*source* author)

is remarkable. The category of portraits-bodies was quantitatively more represented than the category of buildings-spaces.

16.5.6 Daniel Libeskind with Limited-Endless Binary Opposition

Daniel Libeskind, who participated in the Deconstructivist Architecture Exhibition with the Berlin City Edge competition project in 1987, is the architect of a project that is talked about frequently even today with the forms, angles, and sections that he reveals. Unique features of Libeskind's designs; using large intersecting beams, planes of solid materials, and cracked glass. Libeskind's approach to designing buildings is to reveal what has never existed or been built before.

Digital representations in Fig. 16.7 are evaluated in the context of Limited-Endless binary opposition; it is seen that the digitals under the title of buildings-spaces mostly refer to the buildings of the Royal Ontario Museum, National Holocaust Monument, Michael Lee-Chin Crystal, and The Jewish Museum Berlin. The opposite poles evoked by the limited-endless binary opposition are revealed in digital representations through lines, geometric extensions, repetitions, and shifts. Manipulation of both buildings and interior images has illusory effects. In the digital works under the title of portraits-bodies, the portrait of the architect is deformed independently of his buildings, but with interventions that evoke buildings. Similar to the buildings-spaces category, the staves are reproduced through repetitions and shifts.

Fig. 16.7 Digital representations for Daniel Libeskind: buildings-spaces and portraits-bodies (*source* author)

16.5.7 Bernard Tschumi with Familiar–Unfamiliar Binary Opposition

Bernard Tschumi, who insisted that there is no architecture without action, no architecture without event, no architecture without program through drawings and written texts in the 1970s, participated in the Deconstructivist Architecture Exhibition with a competition project he won. The Parc de la Villette (1982) project displayed a deconstructive perspective on the ideas of function and space by revealing the relationship of red metal cubes with axes and the composition of geometric forms. Thus, it has been revealed that architecture is not only about space and form, but also about event, action, and what happens in space.

Digital representations in Fig. 16.8 are evaluated in the context of familiar-unfamiliar binary opposition; it is seen that all of the digitals under the title of buildings-spaces belong to the Parc de la Villette and Acropolis Museum buildings. The familiar-unfamiliar binary opposition is established through the reproduction of grids, folies, and plinths in digital representations. Tschumi's concepts of juxtaposition and overlapping and the concepts of inversion, superposition, and superimposition come to the fore. The use of red color dominates. On the other hand, in the digital works under the title of portraits-bodies, the portrait of the architect was reconstructed by being deformed together with his buildings. Digitals are represented with binary opposition and buildings together with red color and usually the same portrait.

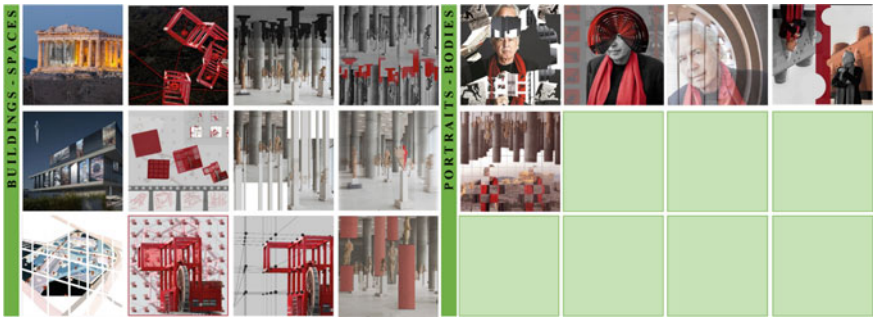

Fig. 16.8 Digital representations for Bernard Tschumi: buildings-spaces and portraits-bodies (*source* author)

16.6 Conclusion

This paper, conducted through examples of digital representations of deconstruction and binary oppositions, deals with the deconstructivist representation of all deconstructions in terms of meaning and form. From this aspect, it offers an original section consisting of an infinite number of deconstruction possibilities as digitally. In this context, the paper aims that total of 148 digital representations (79 images in buildings-spaces title and 69 images in portraits-bodies title) are an indication that another experiences and new discourses are possible in architectural education through digital data.

Digital representations are evaluated in terms of concepts generated by students and approaches to binary opposition; it has been seen that binary oppositions refer to semantic expansions and affect the editing of the digital compositions. For example, Peter Eisenman's Compatible-Against opposition allows for a deconstructivist grid interpretation, while Zaha Hadid's Fluid-Static opposition has increased motion, line, and surface interpretations. In addition, Wolf Prix and Helmut Swiczinsky's Life-Death opposition presents a dark scene to digitals, while Bernard Tschumi's familiar-unfamiliar opposition contrast colors the representations with red.

In the face-to-face education before Covid-19 pandemic, all outputs of the course were 3D model representations (Fig. 16.9). Two-dimensional outputs were prepared with traditional representation technics, and 3D models were emphasized. Binary oppositions are transformed into three-dimensional representations with the two materials chosen by the students. However, considering the outputs of the course through digital representations in the post-Covid-19 pandemic period, it is allowed the digital composition to be considered more qualified in terms of figure-ground organization, balance, space-place relationship. It has created an important base for the transformation of digital representations into three-dimensional representations. In this respect, it can be said that producing a large number of two-dimensional representations is an important achievement for the course.

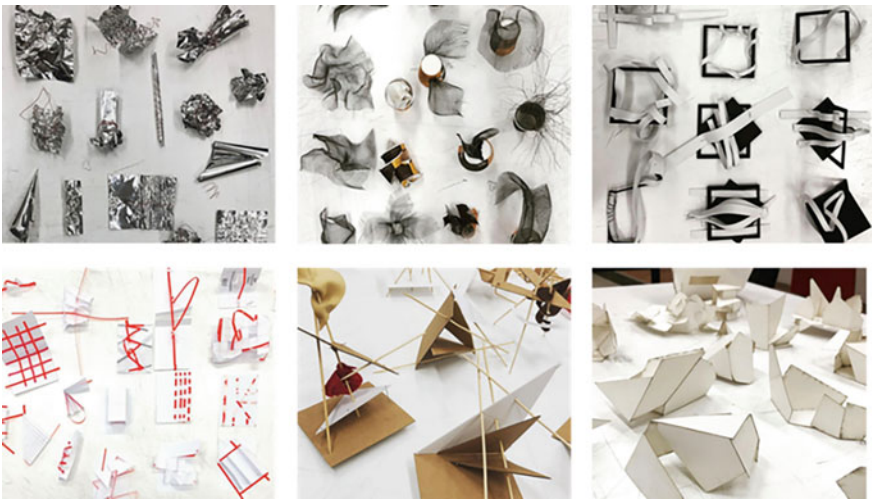

Fig. 16.9 Three-dimensional model representations for deconstructivist architects with binary oppositions before Covid-19 pandemic (*source* author)

Consequently, in this study, which is proposed as a new model that is called digital deconstruction for the distance education in architecture, 'Architecture and Deconstruction' course provided the students with the following skills:

- The strong relationship between architecture and philosophy has been realized.
- New research questions were approached from a deconstructive point of view.
- Deep reading for deconstructionist architects and their buildings has been learned.
- Deconstruction has been used as an important creative tool in digital representation. And the images have gone beyond the accepted norms of architectural representations.
- Digital working skills were gained and each student freely realized their own digital narrative in the digital environment.
- With the online presentation opportunity, students were able to convey their work to large audiences.
- Digital deconstruction model supports goal setting, planning, and self-reflection.
- Digital deconstruction model strengthens motivation, increases participation, and supports the learning process.

Acknowledgements I would like to thank my 7th year deconstructionist students for their effort in taking part in this exercise and for sharing their photos.

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Chapter 17
2020/2021—Changes in the Practical Teaching of Graphic Design

Mónica Sofia Severino Inácio Lameiro

Abstract This article is part of a doctoral research on analyzing the specialty of graphic design and visual communication. It discusses how the recent pandemic contributed to changes in the practical teaching of Graphic Design Projects and the impact on the subjects involved. Higher education in the discipline of graphic design has undergone profound changes since the beginning of the exceptional pandemic situation, and after almost two academic years of this experience, teachers and students still apply the methods and practices developed and implemented as a complement and resource during the pandemic. We observe how new ways of exhibiting, reflecting, monitoring, and validating projects were created through new digital resources that made it possible to fill the gap in face-to-face design educational techniques. In addition to distance learning tools, mixed modalities were also implemented in transitory phases of several states of emergency. To obtain satisfactory results and achieve the objectives proposed in the curricular units, it has been necessary to readjust the contents and the way of addressing the creative challenges that are posed to the students. We also need to articulate this need with availability that should be as close as possible to the classroom/creative studio dynamics. Therefore, we propose to present a set of data and advanced practices based on a close relationship, constant connection with the student and their project, by creating more autonomous learning paths, based on the use of available digital tools that allow the student to manage their creative process, advancing to cohesive results.

Keywords Graphic design · Higher education · Project design · Creative studies · Pandemic

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17.1 Introduction

The galloping evolution of the pandemic very quickly gave rise to the declaration of the State of National Emergency decreed by the Portuguese Government in March of 2020. Portugal, like several countries in the world, was affected by this global health crisis—a crisis that significantly changed the normal functioning of all sectors of society.

Following the provisions of Decree-Law No.10-A/2020 of March 13, teaching and non-teaching activities with the presence of students in public, private, and cooperative educational establishments were suspended.

The application of this legislation forced educational institutions to apply exceptional measures to respond to the new teaching scenario in order to maintain the regular functioning of their teaching activities.

ISEC Lisboa—the polytechnic higher education institution where this study was conducted—like the directors of other national educational institutions, had to implement a set of government guidelines and was forced to immediately define and implement new models of teaching. The School of Communication, Arts, and Creative Industries of this institute, like the other schools of the same institute, had to define interdisciplinary teaching–learning strategies to be implemented in the courses it teaches.

It is from this action that emerges the need to think and implement new ways of teaching design curricular units whose nature is mostly practical. The Project classes of the 3rd year of the Bachelor's Degree in Design and Print Production were the subject of this implementation, and it is on this case that our study is focused.

This highly practical curricular unit aims to reflect the knowledge acquired throughout the Design and Print Production course. The objectives are structured in a way to value thought and practice and aim to develop creative synthesized expression through the student's path, through a set of core curricular units attended throughout the course in the fields of creativity and print production. The projects to be developed in the course are copyright and must engage the student to solve cultural, social, and ecological challenges. They should also explain the implementation of design project strategies from conception to production, through the material and technological resources available at the school, simulating situations that meet the reality of the Graphic Design and Visual Communication market, always seeking to provide a set of competences with an innovative aim. In a conventional, face-to-face setting, this curricular unit would be taught by a teacher with the support of tutors appointed in order to follow the students throughout their projects. The 2020/2021 academic year did not entail this situation, with the curricular unit being taught by only one professor.

In a first stage, in a period of two months, from March to April of 2020, this curricular unit was no longer taught in person, being entirely taught remotely. Thirty-two enrolled students were in their homes, and the lessons were taught remotely, with the use of digital platforms like Zoom, email, or Moodle. In a second stage, as of

May of 2020, the adopted teaching mode was hybrid, with some in-person classes and some online mentoring support sessions.

In this pandemic scenario, constant adaptation was the driving force for students and teachers involved in these new forms of teaching–learning to try, in each class, to maintain the levels of creativity, enthusiasm, sharing, and discussion—characteristic of face-to-face design project teaching.

Together, students and teachers were finding new ways to give and receive, thus contributing to the performance of the various ongoing projects. Every week, the needs were the baseline for the improvements to be implemented.

With the main objective of promoting the acquisition of knowledge, development of more autonomous creative and decision-making skills, and overcoming the constraints arising from remote learning, with no online collaborative design platforms (apart from the conventional Acrobat or Adobe software), there was an attempt to create project creation/reception/discussion collaborative work alternatives, as well as real simulations of project presentation and defense that got as close as possible to the reality of face-to-face interaction.

17.1.1 Design Project in Remote Learning

The teaching of design project entails creating conditions for the student to develop autonomous skills in defining their objectives and the processes to be adopted in the various stages of the development of their project, and we must ensure that students are actively engaged—feeling responsibility for their own learning—and that they have significant control over their design experience.

The definition of objectives implies to promote, together with the students, the systematization of information and the definition of the best communication channels to reach their hypothetical audience, as well as the definition of ways intended to reach that audience, through the impact created by the functionality and the aesthetic of their products or services created.

Furthermore, the student should also be able to relate to the teacher and classmates throughout this building process, just as they would in a real context with clients and colleagues, in order to present their ideas and receive input for their project.

In the classroom context, the creation/visualization of the various solutions concerning the design project entail a situation of mentoring, monitoring, and validation of the various creations, by the teacher, with the goal of providing the student with clues to reach, in an effective way, the results of their problem.

As Pozo-Puértolas (2020) tells us that the student who performs the creative activity normally reasoning is based on visual language as a means of expression (images, diagrams, diagrams, and others), in this sense, the use of an appropriate working method that allows the representation of the contextual framework makes it easier for him to know the subjects that interact in a project in design or in applied research in design. We consider that this typology of methods can facilitate the

connection between teachers and students both in the project phase and in the phase of exploration of the information and data that support a certain argument.

According to Frascara (2004), every communication design project requires planning at the levels of communication, visualization, and production. The first two levels imply studying the problem, developing strategies, and creating design proposals.

The organization of the design process is a design problem that students must deal with. If in a usual in-person learning context, time management in and after class is one of the factors that most influence student performance, and the organization process becomes a more complex component when the student is autonomously in control of their time devoted to project tasks.

The development of a project, regardless of its nature, requires constant testing of the solutions created, which is a situation that the in-person classes allowed to streamline with the assistance of the teacher. Another considerable and different aspect of classroom classes is the fact that students cannot make their models using the school's most professional resources (printing, cuts, collages). This constraint could have led to project failures as the testing stage would be more compromised, forcing the students to redo and rethink the initially defined proposals.

17.1.2 The Impact of the Pandemic in Collaborative Design Work

Collaborative learning is an educational approach to teaching and learning that involves students working together (in a group) to solve problems, complete tasks, or create something new. According to Gerlach (1994), collaborative learning is based on the idea that learning is an inherently social act in which the participants talk among themselves and, it is through the talk that learning occurs.

As stated by Srinivas (2011), there are several benefits to this learning process. In the collaborative learning environment, the learners are challenged socially and emotionally as they listen to different perspectives on their work and defend their ideas and perspectives. Doing this, students begin to create their own conceptual frameworks and do not rely only on a teacher's (or expert's) framework. In this context, all students can talk with the peers present, express their ideas, exchange diverse beliefs, question conceptual ideas, and be actively engaged.

These sharing actions not only have an impact in the individual learning of each student, but also in the collective learning of the group they belong to, since conversation and discussion among colleagues promote social skills, such as sharing and group analysis, making everyone reflect on their processes (common or not) and objectives defined and achieved, as they progress in their projects.

As Smith and MacGregor (1992) stress, teachers who use these approaches tend to think of themselves less as expert transmitters of knowledge to students and more as expert designers of intellectual experiences for students, as coaches or co-creators of a more emergent learning process.

This active learning methodology, applied in remote learning, is strongly augmented using technologies that students have at their disposal: email, Moodle platform, Zoom, and applications of immediate communication, such as WhatsApp.

Group work implies that the student is able to deal with the group context: to explain ideas to colleagues, to hear and to consider alternatives for the project, to reach a consensus, and to integrate the contributions received by some members into their proposals, with the aim of constant improvement.

17.2 Methodology

When the state of emergency was declared in March 2020, the 2nd semester had already started, and the project classes were already taking place in the classroom, with the in-person mode. Circumstances did not predict that we would return to the 2019/2020 remote learning mode, and therefore, there was no time to plan in advance the activities and methodologies applicable to remote learning for this curricular unit.

When the immediate cancelation of teaching activities was decreed, the students were still in a very early stage of their design projects. Until then, the project briefing had been presented to them, and they were maturing their first ideas to be able to present them in the classroom. Thirty-two students were enrolled in this curricular unit.

Given the project—and mostly practical—nature of this curricular unit, some tools to help the students' personal organization were implemented.

An effort was made to minimize the absence of the teachers' face-to-face mentoring of the students, as well as to minimize the inherent environment of the design classroom context. And so, for this reason, some tools were created to follow the projects and their authors.

In a design project, it is crucial that students gain autonomy regarding time management, as the project encompasses several stages of development. Thus, a schedule of classes was initially established in order to assist students in the organization and development of their projects, according to the objectives defined for each of the stages established by the teacher. The students embraced the schedule as it allowed them to have a macro view of the subject, mentoring moments, submissions, and evaluation. This tool allowed them to experience the use of a project timetable—a tool used in production in a professional context.

Since the beginning of the classes, the students were aware that the moments marked on this calendar could be subjected to changes, in case of unforeseen events, which was something that eventually happened with the announcement of the cancelation of the in-person classes. This situation forced a revision of the schedule, and the setting of new dates and moments for the analysis of their proposals, by the teacher. The changes were smoothly concerted between the students and the teacher, without compromising on the one hand, the objectives of the curricular unit and, on the other, the different expectations and strategies defined by the students.

Alongside the conventional communication resources, such as email or the Moodle academic management system, the WhatsApp application was also used. This application was effective in quickly sharing ideas to obtain feedback from the teacher (between classes) regarding choices (typography, colors, shapes, materials), or for the teachers and students to share situations considered important for the specific project of each student, as well as useful information pertaining to the different projects. Some students had the same doubts, and the answer to a student could serve as an answer to a colleague's question, thus turning this channel of communication with the class into a kind of very useful FAQ archive. The "on time" response of this platform was very well received by the students for its chat feature, with which they are very familiar.

The conventional classroom gave way to the virtual classroom through online sessions using the Zoom platform. The regularity of the weekly class schedule was maintained. However, it was necessary to hold a series of additional sessions, divided into three different modalities: group sessions (with the whole class); theme group sessions (with a group of students whose project theme had common elements); and individual sessions (one student at a time).

An attempt was made for the online sessions to closely follow the dynamics of the classroom with the sharing of content and more practical intervention on the design created by the students. This was done through feedback in real time, by the teacher, on the project (the student would share the file with the teacher, and the teacher would manipulate the file in their computer using their software), or through verbal explanation and reaction of the student on the design. These sharing situations resulted from the need to show the student—as it would be done in the classroom context—other paths and possibilities in the proposal they were presenting correction of language, shape, and visual elements presented (typography, color, visual language), in order to solve less creative or technically deficient situations. This situation was solved by using collaborative design platforms that allow this more direct action. However, other remote access platforms such as TeamViewer or Zoom's remote-control feature, which allow control of another participant's screen in the meeting, were not used, due to the high number of participants in each session, the time limit of the session, and the time limit available for individual support for each student. This alternative compromised the performance of each work session, and that was one of the reasons to discard it as a solution.

In addition to these strategies, and between synchronous sessions, students had the chance to email their doubts, receive feedback via commented pdf, or send suggestions (inspiration images, solutions similar to the intended) and then correct, show them again in the next online session, and get further clarification or approval of the solution found. That way, the students managed to independently advance their tasks (between sessions), and without compromising their initial schedule and the initial objectives that had been defined. This mentoring gave security to the students and filled some gaps stemming from poor personal time management, lack of creativity and motivation.

In a total of 34 students enrolled in the curricular unit, 34 projects of ten different types were carried out, in the field of visual identity creation and overall communication of brands of decoration, food, beverages, beauty and well-being, games and entertainment, art, music, fashion, animal and human health, and tourism.

17.3 Discussion

The intermediate pedagogical monitoring survey conducted by ISEC Lisboa—which aimed to collect the students' opinion regarding the teaching–learning process adopted, given the remote learning of the 1st semester of the 2020/2021 academic year—did not provide a direct answer to our study, as it was aimed at issues related to student satisfaction with the (overall) quality of teachers regarding the transition from in-person learning to remote learning. As such, there was a need to create a more targeted and complete monitoring instrument, in order to measure the impact of the tools used in the teaching of the Project curricular unit.

The survey was conducted and subsequently analyzed after the completion of the curricular unit, which culminated in the presentation and oral defense of all projects, and allowed us to better understand the results of this experiment.

The statistical population of students (34) corresponds to the number of students enrolled in the curricular unit who had this experience in remote learning design classes. A total of 15 answers were obtained, corresponding to 44% of the population and, thus, to our sample (Table 17.1).

The results obtained in this survey contributed to a better understanding of the impact of design project teaching–learning in a pandemic context—a situation where it was possible to use multiple tools in order to minimize the differences between in-person learning and remote learning. The purpose of the survey was to assess whether the tools implemented had an impact on students and whether or not they contributed to minimize the differences felt between the two types of Project.

The analysis of this experiment was carried out through the presentation of the students' final projects in two modalities: remote presentations and in-person presentations (after the mandatory lockdown was lifted). Once all the presentations were completed, at the end of the curricular unit, the students were asked to fill out a satisfaction survey regarding the quality and impact of the teaching–learning process implemented in the Project modality during the period in which it was taught remotely.

When asked about the teacher's performance in the implementation of teaching–learning methodologies in the Project subject, in the transition from face-to-face

Table 17.1 Characterization of the universe and the sample of students of the "Project" curricular unit in 2020/2021

Population	Sample	Sample/population
34	15	44%

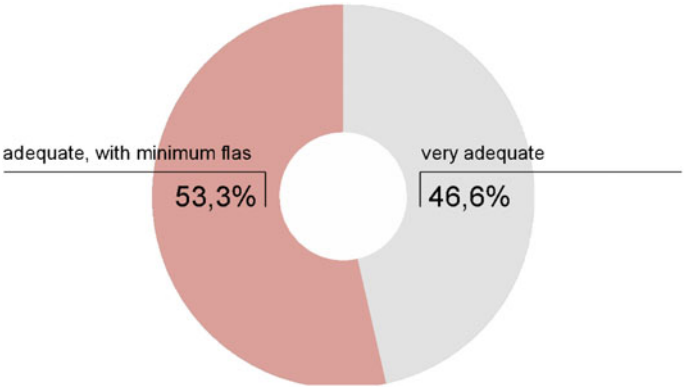

Fig. 17.1 Graphic representation of the answers regarding the quality of the "Project" subject teacher, regarding the transition from in-person learning to remote learning (*source* author)

learning to remote learning, most answers (53.3%) stated them as "adequate, with minimum flaws", and 46.6% of the answers referred to the methodologies implemented as "very adequate" (Fig. 17.1).

Asked about the strategies that had the greatest impact on their personal performance in the curricular unit (Fig. 17.2), about the preference between the custom (individual) or group (by theme) zoom sessions, the students reported that "the individual session served to clear many doubts and helped to better understand—according to their particular case—what they could improve" and that, in the group sessions "the suggestions and doubts of colleagues were also very useful". They also mentioned that "it allowed them to compare some project hurdles with the ones of other students, thus helping them to overcome said hurdles". They also stated that the custom zoom sessions (one student) were the most effective in exchanging ideas and receiving unique feedback from the teacher.

From the opinions collected, the students mentioned, as a less positive aspect (and to be improved), the fact that the subject, in their opinion, needed more mentoring sessions, given its practical nature, the workload necessary, and its technical complexity.

Regarding the use of WhatsApp as a communication support platform, students reported that this strategy had the most impact on their performance because "it was a new reality and the teacher was always available to provide support and motivation, which always made us feel motivated and supported".

When asked about the greatest difficulties felt in the project remote learning (Fig. 17.3), most answers (46.7%) pointed to the time management issue, followed by the lack of classroom dynamics and the lack of personal motivation. These answers reflect a personal and circumstantial responsibility of the students, and not a responsibility attributed to the methodologies applied, which were later reflected in the results of the projects. The students also stated that the lack of motivation was strongly due to "the lack of physical contact with the classmates and the teacher" and the lack of

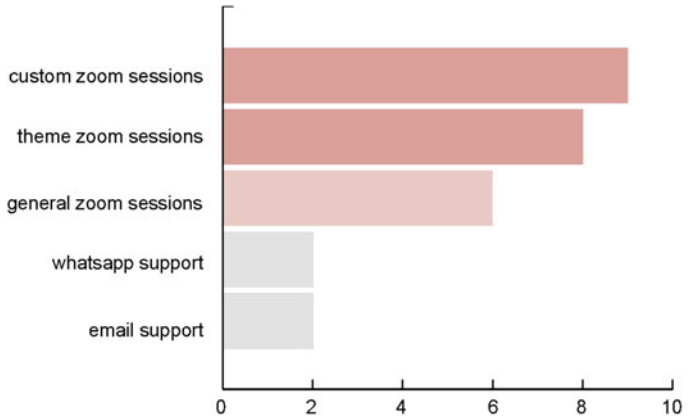

Fig. 17.2 Graphic representation of the teaching–learning strategies considered by the students as most effective (*source* author)

"dynamics created in the classroom". They still reported as one of the weaknesses of this learning mode the lack of contact with the objects and materials.

Despite the positive aspects outweighing the negative ones, the teacher's performance, despite the diverse application of teaching tools, may not have been as comprehensive as intended, as some students report, as it is "a very difficult curricular unit to do in this mode, since it is essentially practical work and it is a large project", and despite the number of sessions held with students (in addition to the contact hours established in the curricular unit sheet), the subject needs "more mentoring hours", and that in this modality, this could only happen in the form of more online individual mentoring.

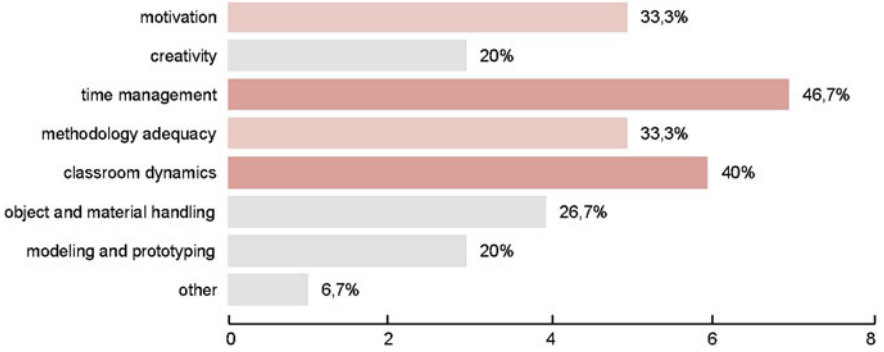

Fig. 17.3 Graphic representation of the aspects considered by the students as the most negative in the remote learning of the "Project" subject (*source* author)

17.4 Conclusion

Without the usual scenario of teaching and practicing of the design project, resulting from the decisions brought about by the pandemic, the students were abruptly faced with the need to change their routines. The use of class time to develop concepts, share ideas with colleagues, handle materials, model the pieces, and receive input from the mentor (teacher) gave rise to new autonomous teaching–learning processes without the physical contact—characteristic of a favorable environment, and typical of the teaching of practical design, which was the workshop environment that was fostered in the classroom.

This challenge brought about the need to implement adequate quick responses to minimize or remedy the negative impact that this situation would have on the students, not only in terms of creativity, but also in terms of their well-being and, later, obviously in their performance and results.

The tools and techniques used optimized learning and sharing and provided the students with support and help from the teacher, as close as possible to what is experienced in the classroom.

The streamlining of classes and the variety of learning aids implemented (group, custom, and theme zoom sessions and email and WhatsApp sharing) was one of the most positive aspects of this experience, bringing security to the students, through the constant support of the teacher, in the development of their projects, even in a remote context, which was totally different from the creative and sharing habits they were used to. The data reveals that the strategies implemented were welcomed by the students and had a positive impact on student performance and results.

Although students pointed out—when referring to the less positive aspects—the importance of sharing ideas in the classroom context and considered that project classes (even in the online mode) should have more hours, they reported that the greatest need that they felt during the remote learning period was the absence of the classroom component dedicated to the mentoring component pertaining to the more manual component of the subject (prototype modeling and handling of materials and objects) that usually occurs as the various projects progress, which is a constraint that occurred almost universally.

The data collected also allows us to see that the objectives set for this experiment were achieved, revealing that the tools implemented allowed for significant gains regarding the teaching of the design project, to the fundamental social component in the development of creativity, in the personal and psychological component of each element, and also in the academic results obtained by most students.

This experiment allows us to better understand their needs and shortcomings as young designers and how these needs should be considered and should contribute to a better functioning of the subject, namely in the component of hours dedicated to mentoring. These young students showed a need for a lot of help in decision-making and methodological guidance for their projects, proving to be very dependent on the teacher's approval in what concerns decision-making.

On the other hand, the conduction of this experiment showed us that it had an impact on the development of students' project autonomy, which is a key skill set for young designers.

From the teacher's perspective, the openness to this experiment and the results obtained allowed us to understand that there is a set of tools more suited to remote learning that can serve not only the proper functioning in this mode, but also complement teaching–learning in a mixed mode, which includes online sessions and classroom sessions that promote greater flexibility and autonomy in the learning process, ease of access to new content, and quicker responses between contact moments. We also consider that the benefits acquired always entail a good relationship of collaboration and openness between everyone involved in this process.

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Chapter 18
Regenerating Relationship Spaces of the Post-Covid City

Concetta Fallanca, Antonio Taccone, and Chiara Corazziere

Abstract Starting from the formal and performative characteristics of places within cities designed for the purpose of the physical, social and cultural creation of places, this contribution examines the valorization of space and time to propose some reflections on the theme of rediscovery and proximity based on the concept that spatial relationships are important to propose a design model that also includes the control of urban well-being aspects. Experimentation through laboratories such as La.Stre of PAU Department, in particular university ones capable of connecting the energies of the first, second and third missions, can be the secret to offering a contribution to the complete cycle of the process: from conception to from the shared planning, from the comparison, from the realization process with choices as reversible as possible, up to the observation of the results, to introduce continuous corrections and reinterpretations of the phenomena. The experiences tend to verify the social impact of the proposal to highlight the impact of social, economic and environmental policies on the activation processes, of capacities and communities, which must ensure positive benefits for the health and life of the city. The parameters considered refer to: healthy and active life, urban and environmental safety, climate change, urban planning and design for neighborhoods, removal of architectural barriers, accessibility and proximity to services, participatory and inclusive processes for citizens. By acting on urban specificities and on the socio-economic and environmental distribution at the local level, the aim is to achieve well-being and health equity and to reduce or eliminate environmental and exposure risks.

Keywords Health city · Well-being · Relationship spaces · Urban quality · Urban regeneration · Health equity

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18.1 Introduction

The spread of the Covid-19 contagion has brought out the limits of a social and economic model based on unlimited resources and on the country's ability to manage the unexpected, highlighting the need for a new planning vision that restores centrality to the right to the spaces of relationships social issues and above all the *right to culture*.

The experience of recent months with the restrictions on social relations and the resulting economic and social crisis has led all of us to reconsider and re-examine some paradigms in this field and to create new, healthier and more interesting ones (Barton and Grant 2013).

Furthermore, the role of urban and environmental planning is already taken seriously in promoting measures to improve the health and well-being of residents toward sustainable, safe, healthy and socially inclusive cities (WHO 2017). Cutting-edge experiments and research aim to design new "social models" that rethink priorities and paradigms, aiming for new collaborations between complex fields such as medicine and urban planning in a multidisciplinary environment (Fallanca 2021).

Today there is a tendency to rethink integrated urban planning that provides adequate responses to the needs of people and communities, improving living and working conditions, structures and services, lifestyles and access to opportunities, building benefits in relationships social (Fallanca and Taccone 2021).

The specific interests of the themes that contribute to the integrated urban planning process mentioned above are sustainable mobility, the connectivity of urban ecological networks, the morphology and climatic health of urban organisms, community spaces suitable for raising the architectural quality linked to design, access to culture and the possibility of continuous personal and socio-cultural growth (Rosa 2017).

This continuum connects urban planning research for the improvement of cities with the right to enjoy what the cities themselves offer, recognizing that the forms of alienation encountered in ancient and recent times ascribed to cities are instead manifestations of human errors in planning, implementation, misuse and failure to correct course through targeted measures.

18.1.1 Pro-Well-Being Places: Performance and Formal Characteristics

Urban well-being requires an environment suited to the complex physical, mental, relational and cultural needs of individuals and communities. Policies, strategies, plans and projects should therefore strive to capture their essence and the best possible predictions based on the "place" and with respect to their main characteristics. The ongoing methodological considerations aim to elucidate principles and reference standards to direct urban planning toward more health-friendly urban models, through

multiple disciplines and different application contexts, and to evaluate the effectiveness of interventions, urban projects, operational projects of programmatic tools and the performances achieved (Taccone 2020).

Considerations are proposed that incorporate a body of research aimed at entering into a nascent and disciplinary debate on the topic of sustainable regeneration of livable and healthy public spaces (Rainer and Capolongo 2016), starting from its formal and performance characteristics of urban places designed to create spaces toward the physical, social and cultural well-being of places.

In the question of urban form, the alternation of areas with different grain sizes, the use and quantity of shared spaces, the distribution of open spaces, the role of green spaces and urban ecological connectivity networks are identified as essential values for the climate health of urban life. The compact structure of the city lends itself to applications that follow the logic of flow and vector direction and, in this case, the separation of inflow and outflow paths may be necessary to underpin the planning and regeneration process.

In other words, the proposed measures are similar to those taken to ensure the safety, real and perceived, of the city. Indeed, the promotion of well-being can only be fully effective in places where security is preemptively ensured, where vulnerability to risk is already low and which have, therefore, high degrees of resilience.

The vision of an organic city is still incomplete, so current emergency planning does not take route systems into account, even in the analysis of safe and waiting areas. It is important to transform "safe islands", which are too often "rejected" in times of emergency, into social spaces that increase the level of quality of life and urban quality (Fallanca 2020). Safety education aims to convey the awareness that a place that is easy to reach represents a place to live well.

This also includes connecting and promoting access to areas and places where cultural activities can be carried out in order to encourage individual and collective growth and the exchange of experiences. Investing in human heritage and citizenship requires redesigning public mobility toward soft mobility and rethinking when and how we access and enjoy key places in our cities (Naylor and Buck 2018).

Working in a network logic means connecting important places for the identity and security of the city, combining activities for the protection of historical-architectural values with renewal and regeneration processes necessary for a continuous creative development of the city and its parts.

18.2 The Lesson from University Experimentation Laboratories for the Post-Covid City

For over a decade in our country, particular attention has been paid to the influence on health by urban planning, overcoming the concept of the city project as a purely spatial approach, considering it useful to include in the concept of plan also that of human activities understood as a process of change and not just as a future vision of the city.

In the experiences conducted by the La.Stre laboratory of the Heritage, Architecture, Urban Planning Department, an integral urban planning is sought through the themes of sustainable mobility, the ecological network, the configuration of common spaces with high urban and relational quality and access to culture toward individual and social cultural growth.

The laboratory is characterized by the chosen method and maintained over the years, which tends to finalize the energies coming from the laboratory teaching and research activities to a specific goal of advancement of knowledge, concentrating the energies of the activities toward the comparison, dissemination, management and diffusion of the results expressed in the context of the Third Mission. Within the three main activities—teaching, research and third mission—it makes sense to retrace the expectations, the results, the repercussions of the experiences carried out in recent years in teaching, research and experimental design laboratories with the aim to critically read paths and repercussions also to relaunch initiatives that still demonstrate validity today and that could be re-proposed (Fallanca 2019).

Most notable among these are the activities of the workshops and design laboratories, which provided experiences of teamwork and cooperation in which different skills were shared in the service of common goals. An added value is the exchange of experiences between the work and university environment with the involvement of figures from the academic world (urban planning, anthropology, restoration) and the professional world (architects, urban planners, geographers, urban phenomenologists, sociologists) with actors of different experiences (teachers, young researchers, senior students) and the community of administrators, citizens, students, scholars and local technicians, who participate in a proactive and intellectually generous way.

Even the experiences of continuing and recurring post-graduate training have left useful and current ideas for new forms of design. Already from the exchange of the Workshop *Vers une architecture des milieux*[1] with French colleagues, the centrality of "common" design emerged, the importance of the path, the working method and the sharing of individual impressions and considerations as the outcome of the research group, at least as important as the project and its implementation. Then the training course for planning in sensitive environments[2] allowed to deepen some proposals advanced at the end of the training experience in published research, to give an account to the scientific community of the validity of the results and increased the exchange between the teaching staff and the scientific committee of the course. Among the post-graduate training experiences, the most significant one concerns the "Genius Loci" advanced training course, which for a year involved both professionals with roles of great responsibility in the territory (regional, provincial, park authorities, wide area, municipal functions) and national and international

[1] Italian/French Workshop Vers une architecture des milieux, an interdisciplinary research and exchange project between the AACM Department of Architecture and Analysis of the Mediterranean City and the Ecole Nationale Supériere d'Architecture de Paris La Villette, Laboratoire Gerphau. Scientific managers: C. Younes and C. Fallanca.

[2] Post-graduate training course for coastal landscape design in the Mediterranean environment created with funds from the Ministry of the Environment and Land Protection—Sustainable Development Directorate.

experts and from the world of the Academy. The formative strength of the experience, which would have deserved to become cyclical if not permanent, lay precisely in the adopted formula of strong transfer and exchange of experiences, to and from faculty.[3] The significant participation of colleagues, who too often work burdened with responsibility in the solitude of their own Urban Centers, planning offices and local government, has made it possible to "propagate" the most sensitive reflections and the most careful experiences on the meaning of making choices on the territory, in an urban environment, in historical centers, and for the naturalistic and historical-cultural heritage.

The experience of the workshops related to the regeneration of public space also accompanied the activities related to the shared construction of ideas of the future ancient village of Precacore (Samo, RC). The project starts from the assumption that the location of the *ancient village of Precacore*[4] within the Aspromonte National Park represents a particular condition that combines natural conditions, landscape, and human inventions. It is precisely this intertwining between nature and human works that makes this area special, where the ancient village of Precacore, of extraordinary beauty emerges from the vast woods of the Park. This condition is of great interest for any interesting opportunities and conditions of cultural animation aimed at creating moments of welcome, information and hospitality and dissemination of the identity processes that shape and structure the places themselves.

Another line of activity that has a direct correspondence with the concepts of inclusiveness, safety and sustainability of spaces is represented by the experiences resulting from calls, conventions or projects at a European level. The projects carried out with the Interreg *Centurio*[5] and *Relate*[6] programs demonstrate how, even more than physical forms, the possibility of self-determining one's own urban future counts, full involvement in the processes of qualification of the spaces of a neighborhood which, albeit socially and materially degraded, opens up to minorities and citizens who do not enjoy strong representativeness, questioning and renewing the original identity of the community, opening up to the possibility of inclusive, cosmopolitan and multi-ethnic cities.

Safety implies the right to a pro-well-being urban environment and the planning of all actions aimed at a serious prevention of hydrogeological and seismic risks. in this sense, the research *Terre in Movimento*, presented for Sensi Contemporanei, saw the development of a map of the risks of Calabria and the preparation of research and exchange reports aimed at systematizing the most innovative thinking of a design

[3] II level Master in "Governance and Territory" project funded on the Empowerment Program of the Public Administrations of "Mezzogiorno", in collaboration with the Formez.

[4] Convention for the technical-scientific collaboration relating to the shared construction of Ideas of the future ancient village of Precacore, in implementation of the Program Agreement between the Aspromonte National Park Authority and the Municipality of Samo for the recovery and consequent reuse of the ancient village of Precacore, between the Department of Heritage, Architecture, Urban Planning (PAU) of the Mediterranean University of Reggio Calabria and the Municipality of Samo.

[5] Interreg III C, "Urban policies in the Mediterranean", Generalitat Valenciana e Regione Calabria.

[6] Interreg IIIC project, priority line for the creation of urban planning tools for socio-cultural integration.

nature on living with risks using this penalizing condition as an opportunity to aim at reducing vulnerabilities through transformations of high urban and territorial quality.

On the authentic meaning of seeking actions that pursue sustainability, the *PianoCal* research,[7] for the development of a collaborative platform for constraints, has made it possible to arrive at qualitative and quantitative definitions on the value of the place, with the aim of reinterpreting in a positive and re-proposing the tool of the constraint as a means of defining and protecting the territory, from which to start for a sustainable design approach to the heritage and cultural identity of places, according to a reflection already started with the *CityMob* research project.[8]

In the CAPACITY project,[9] La.Stre intended to take up the challenge of transforming a heavily degraded suburban neighborhood into an "open-air laboratory" by networking all the human, economic and environmental resources of the territory, to promote the growth of employment and the use of the skills of the local economy, directly involving the population to enhance their specific skills and facilitate their integration. The project, following a principle of minimum intervention/maximum result, proposes the birth and growth of a series of social and economic initiatives, which will have as a minimum common denominator the enhancement and promotion of local identities, in order to trigger an overall path of redevelopment and sustainable urban integration.

The project relating to the drafting of the PSC of Villa San Giovanni[10] has among the specific objectives that of the reconstruction of a recognizable urban identity, through the recovery of the functionality and decorum of the spaces of relationship and of the places of residence in the consolidated city. Furthermore, the potential for re-use of the numerous decommissioned areas present in the urban center will be optimized, aiming at their ability to attract economic activities with high added value and high technological content, to be integrated with those currently existing. Another specific objective is to improve the safety conditions of the city and the territory, reducing the vulnerability of the network infrastructures and the urban organism with respect to seismic and hydrogeological risk and by structuring suitable first aid areas.

Finally, in the study "*Criteria and methods for rethinking the place of welfare communities in the urban reality of the Metropolitan City of Reggio Calabria*",

[7] PIANOCAL project, "Collaborative platform for constraints and the territory", funded under the POR CALABRIA FESR 2007/2013.

[8] Project The enhancement of the urban heritage through innovative models of sustainable urban mobility related to the Call for the financing of research projects in the human, economic and social sciences.—Calabria Region Dep. 11 Culture, Education, Higher Education, Research.

[9] CAPACITY, Care Abilities and Professions for an Aggregating CITY project, presented as part of the 1st Call for Proposals of the URBAN INNOVATIVE ACTIONS (UIA), in partnership with the Municipality of Reggio Calabria (Leader Partner), Sustainable Territory Planning Department, Mobility and Transport, Smart City, EU Policies.

[10] Project "Villa San Giovanni, activities aimed at drafting by the technical offices of the Municipal Administration of the PSC with annexed REU and the VAS"—Agreement between the Municipal Administration of Villa San Giovanni and the Heritage, Architecture, Urban Planning Department (PAU).

the tensions of experience converge and their preconditions focus on the southern neighborhoods of the city where about a third of the resident population lives.

The way it works is a simple methodology to first evaluate a space and consider how well it expresses itself during the day, in the evening, at night during the seasons. This research imagines, designs, creates and validates safe urban spaces, compatible with a good quality of life and which promote healthy, pleasant, active and fully autonomous lifestyles in all phases of life and aims at the same time to reduce or eliminate the obstacles, facilitate the movement of people and ensure rapid, safe evacuation in the event of a disaster.

18.3 The Right to Culture to Generate Places of Well-Being

The spread of the Covid-19 has triggered a state of emergency also with respect to the *right to culture*, making even clearer the need for an inclusive city that favors accessibility, especially for the weakest sectors, to quality spaces, but also for an efficient and safe city, able to prevent and cure socio-cultural isolation and contrast territorial fragility (Indovina 2020).

All the *conventional places* of culture—museums, libraries, archaeological sites and parks, archives—can become, in this sense, accessible spaces in which to look to the community as a privileged vehicle for the transmission of correct and effective behavior toward common resources, including those related to cultural heritage.[11]

This heritage, however, suffers from the lack of an overall assessment of urban vulnerability that requires a true census of buildings of historical and monumental interest that highlights the data related to the risk and the condition of fragility and that also reports data on the actual or potential conditions of interest or risk of the interacting communities. The planning and programming of the territory, could operate, so, a guiding action in establishing a dialogue between interventions operated at the landscape, urban and single building scale of aiming to intercept real demands, propose new lifestyles, anticipate trends, feed the welfare of the citizen with systems of public or collective mobility and sustainable health, accessibility to cultural, natural and landscape resources, to restore quality to habitats and increase ecosystem services and vice versa.

Cultural heritage and landscapes not traditionally understood lend themselves to becoming places prone to host flexible and permeable functions aimed at social, economic and urban innovation. More or less extensive stretches of urban fabric as well as individual buildings, artifacts inherited from industrial or military activities, so the redevelopments made necessary as a result of natural disasters and confiscations, can accommodate proactive actions that promote innovation and creativity of new generations, that counter urban poverty and environmental vulnerability and

[11] In this sense, the Ministry of Culture, with the National Recovery and Resilience Plan (NRRP), promotes the physical and cognitive accessibility of the national cultural institutions under its jurisdiction.

that foster economic, social and cultural promotion for the segments of society that struggle most to regain a stable role.[12] For these places, which suffer from a fragility not exclusively linked to problems of physical degradation, not planning new uses may mean burdening the already difficult land management with an additional environmental risk factor. At the same time, an opportunity is lost to re-define a potential heritage that can guarantee safe and collective spaces for daily life, to generate new urban systems and for new communities of work, culture and well-being (Corazziere 2019).[13]

In fact, the advantage of being able to intervene on the unproductive heritage is represented by the possibility of manipulating the container without weakening its content and triggering processes to invest in human capital and transform problematic areas of the city into opportunities for economic and social growth. Unproductive heritage represents, therefore, the preferential space where to experiment with urban policies at the scale of the point project, creating, for example, research and innovation hubs whose results contribute to the development of the territory, both at the large and small scales, with programs that always welcome the demands of local communities (Corazziere 2022).

To this end, a methodology of intervention should be built starting from some basic actions such as: mapping unproductive, unused or underused areas and buildings to highlight the phenomenon of the disused in quantitative and qualitative terms; building a directorate of knowledge capable of developing and synergistically proposing approaches, standards and rules of intervention on the recent built heritage also to redefine the relationship between the urbanized system and the environment; identify policies, operational devices and collaborative methods between different players to implement effective actions to intervene on materials inherited from a recent past and define new public/private spaces; support the definition of polarities starting with the regeneration of disused complexes that can produce ramified actions of regeneration and well-being.[14]

18.4 Conclusions and Perspectives for the Post-Covid City

Experimentation in laboratories like LaStre can be the secret to contributing to the entire cycle of the process of creating significant spaces, that is, from conception to joint planning, from discussion to the implementation process, up to making

[12] Theme addressed by the *Laboratory of Urban Environment Restoration* (Degree course in Architecture-Restoration, PAU Department, *Mediterranea* University, 2015/16).

[13] This is the emblematic case of the OGR Officine Grandi Riparazioni in Turin and their re-generative process that won them the Urban Planning Award for the category "Quality of infrastructures and public spaces" (www.ogrtorino.it).

[14] A study methodology for disused productive heritage was developed by the research "The importance of business in the development of society: how to read and enhance the cultural heritage inherited from productive activities", carried out by the *Mediterranean* University of Reggio Calabria (2017–2018).

decisions that are as reversible as possible. The activities also involve observing the results within a reasonable period of time and then introducing the necessary changes to reinterpret the phenomenon that accompanies the development of a city. This contributes to a continuous process, allowing "approaches" to solutions which, in comparing possible approaches and cultures, are deemed satisfactory for a certain period of time. This is in the awareness that cities and urban problems require observations, judgements, conclusions, interpretations, corrective experimental measures and possible feedback, rather than absolute judgments and certainties.

It may be useful to recall and revisit the principles that have gradually emerged in the context of the prevention of risks arising from earthquakes, disasters and natural calamities and incorporate ex ante impact assessments in these situations where it is necessary to reorient and safely evacuate large numbers of people (Coppola et al. 2016). New ways of conceptualizing habitats that promote well-being can also draw on standards and methodologies already developed for achieving adequate climate comfort in urban environments, including urban ecological performance and system network evaluation to enhance the presence of nature in cities (Fallanca et al. 2019).

An experimental field that can offer a space for research, starting from a renewed attention to the provision of public residential building areas, thus becomes an opportunity to develop laboratories for design, construction, observation of results and design proposals.

From this interconnected world, resilient urban infrastructures aim to organize sustainable forms of mobility with the aim of increasing the level of safety of cities and promoting a lifestyle that develops well-being.

Two areas of activity therefore emerge: the exploration of the form and function of resilient urban areas considered as organisms and maximizing the use of public spaces to achieve effective climate comfort in urban environments.

As for the activities to reduce territorial fragility, cultural principals and innovative formulas for the transfer of knowledge and specialized training can also be part of a connective perspective and regeneration of urban space and landscape that respond to the real contemporary needs of the community, in some cases strongly multi-ethnic, that aim at a deeper social cohesion in the current inhabitants and that are able to attract new ones (scholars, tourists, professionals, etc.).

They are also part of a new governance in two respects: innovation and effectiveness of management and coherence of planning at different levels. If on the one hand, in fact, it emerges the need to prepare a *Statute* that identifies quality parameters for the administrations and constantly verifies their truthfulness and effectiveness; on the other hand, it is desirable the creation of a *Technical Table*, which promotes actions aimed at increasing the awareness of public administrations at different levels about the importance and the economic and social potential of cultural resources (Di Biagi 2009), which acts as a director of the cultural system; that guarantees quality results also by promoting a constant and structural co-design among cultural institutes; that affects the regional multi-year planning; that supports the various bodies, especially those of small municipalities, in the various planning opportunities, especially those financed by community calls, also to *control* the increase of real estate endowment often destined to be unused or underused.

It promotes, thus, a sustainable and inclusive planning, as suggested by Agenda 2030, which enhances the endogenous potential but in a logic of system and integrated management. Cultural heritage and landscape are understood as a vehicle and space for cohesion, as required by the regional planning 2021–2027, in which to experiment with formulas for innovation, including social innovation, to involve citizens in the processes of growth and cultural production. The National Recovery and Resilience Plan (NRRP 2021), from this point of view, can be an opportunity to strengthen and support some basic rights, such as access to education and culture, to promote measures to counter social and environmental vulnerability, directing urban and territorial policies toward the adoption of sustainable lifestyles, including through urban and landscape regeneration processes.

The vision to which it tends, therefore, is that of common good in which the community of inhabitants operates a constant action of care that fights the erosion of the diffuse heritage, that embanks the fragility of the territories, that contrasts the urban and landscape degradation and that generates actions of beauty and well-being for the user, not only local.

Finally, it also proposes to give institutional voice and definition to those informal strategies that generate and result in deeper social cohesion and a renewed sense of community that interprets the quality of built space not only according to aesthetic or formal canons but according to a more correct relationship between the design dimension and that of actual use, both evaluated in terms of well-being (Corazziere and Gioffrè 2021).[15]

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[15] The "Widespread Park of Knowledge and Well-being" was created according to these principles by the volunteers of the *Associazione Calabrese di Epatologia* of Pellaro-Reggio Calabria. The project has received a recommendation for the National Landscape Award 2021 (www.acemedicinasolidale.it/parco-diffuso).

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Chapter 19
Discovering Post-Covid Social Indicators for Bibliotheca Alexandrina, Alexandria—Egypt

Ola Ali Bayoumi, Amr Ali Bayoumi, and Shahira Sharaf Eldin

Abstract The true meaning of "Bibliotheca" or a library was recognized. Unfortunately, the criteria recognized to establish this type of project develop according to political and social variables and aspects whenever a library is constructed. The new Library of Alexandria "Bibliotheca of Alexandria" underscores the development of a theoretical concept for the construction of modern libraries, as it fulfils the key rules of socio-cultural, scientific, and educational integration at the city centre. In addition, the historical background of this building is a landmark and attractive property for many citizens and foreigners. But the problem is: do the standards created by this library meet the global social and political changes and limitations that have occurred since the spread of the COVID-19 epidemic? Unfortunately, limited construction work has recently been undertaken regarding the number of visitors and the minimum permissible internal space of the Universal Library that can be visited. In addition, social activities such as indoor galleries, conferences, and meetings are kept to a minimum. Therefore, researchers sought to find answers to the above questions based on the historical background of the Library of Alexandria by comparing social and functional developments within the library according to functional variables. This paper also addresses the historical plans of the Library of Alexandria and shows the impact of social and political priorities on the internal transformation of the library to date. In addition, through an ethnographic design approach consisting of observational and computational methods, this paper defines key social indicators that help current libraries adapt to the current "COVID 19" situation. These social indicators are defined by expert research. Expert surveys are conducted individually, either directly, or in zoom meetings. Finally, the authors briefly illustrate the strategies that libraries can adopt towards the COVID-19 epidemic. They also describe

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some scenarios for the near future and point out some needed requirements for the future to cope with pandemics.

Keywords Bibliotheca of Alexandria · Social aspect · Social indicators · Ethnographic design approach · COVID-19

19.1 Introduction

The ancient meaning of a "library" was defined thousands of years ago in ancient Egypt in the form of "a Serapeum" in which the Egyptian identity, Science, and philosophy were printed on walls and Papyrus papers. Actually, this place was a sacred banned place where only priests and rulers were allowed to enter it, on other hand; ancient Egyptian citizens were performing their duties as builders or farmers. After that, in 280 BC, Zenodotus, the great library's first librarian of Alexandria, introduced a rudimentary organization system whereby texts were assigned to different rooms based on their subject matter, on other words "the principle of alphabetic organization" (Garner and JD 2006; Coordinator Bibliotheca Alexandria website Bibliotheca Alexandria 2021). And thus, the "library" took the simplest form of an open space hall with separated sections. And in 7th BC the Assyrian ruler Ashurbanipa developed the first systematically organized library in the contemporary Iraq and in the ancient Middle East. Like all above libraries, the main concept of this project is to collect information, preserve it, and then regenerate it again for building civilizations, and thus, this type of project was forbidden for the public and limited to group of people like rulers, politicians, and sometimes religious people. Those previous rules were key factors for the ancient shape in which the old Bibliotheca of Alexandria were developed but after the development of the real definition of "public libraries in 1800s across Europe and thus to the whole world taking a new shape combined between Social, Entertainment and Educational new purposes. (Libraries and Identity 2010).

Unfortunately, the digital age had significant effects on the functional purposes of the library leading to a partial deformation of the internal spaces and on the main circulations in which emphasis the social requirements in the shape of digital integrations and digital facilities for gaining knowledge. Therefore, the researchers tried to discover the internal deformation of Bibliotheca of Alexandria in different eras by using a comparison of the ancient and new plans and shots of the project. Also, it will link those internal deformations to the social requirements variables between different ages and circumstances. Actually, the initial study will help the researchers to determine the main social indicators developed during the establishing of the two libraries in the same place but at different ages.

On other words, this paper will present an overview of the developed Great "Bibliotheca" according to past, modern, and thus future built criteria based on expert choice in the form of a questionnaire.

What is a "Bibliotheca"? When defining the real meaning of a "bibliotheca", answers to this question obviously vary according to the time and the place in which they were given. On other hand, those definitions are bound all together by a common thread; which is "a Bibliotheca" must be a place and something more than a collection of materials. A definition dating 1915 illustrates the answer to this question thusly, "What is a bibliotheca? Not merely a collection of books, but a storehouse of information, a place to find reading for amusement or instruction" (Curran et al. 2006).

19.2 Social Integration in Bibliotheca of Alexandria

The social criteria in Bibliotheca of Alexandria are defined as the "Soft Values" that emphasizes social integration and participation to the main goals of the Bibliotheca. Those social values were defined as the following: Identity-Human Scale, Walkability-Entertainment space availability- sitting area comfort ability-clarity between public and private spaces.

Outdoor transitional spaces are the outdoor spaces that respond to different needs and activities; different kinds of public outdoor spaces-multisensory experience. Researchers defined the direct social integrations and the indirect ones through an observational method. See Fig. 19.1.

19.3 The Development of Social Aspects Indicators Through History

The Ancient Library of Alexandria was started by Ptolemy I in the third-century BC and served the city and School of Alexandria as well as world-renowned classical scholars such as Archimedes, Euclid, and others.

The library contains many important publications and scrolls from the ancient world. Although, it was not the largest, but most important organization in world culture for nearly 1000 years. For Alexandria, being capital of the Ptolemaic, and Roman Empires, inhabited by 1.1 million people, it was the most modern city in the classical world of that time. This city was the home of Alexander the Great, Julius Caesar, Marc Antony, and the last of Ptolemy Cleopatra.

Following the typical mythological theme associated with the ancient Egyptian civilization, the ancient library has a mysterious history related to disappearance, supposedly the victim of fire, earthquake, and negligence.

The first call for reviving the Alexandria Library was in 1974, an idea that was later adopted by the Egyptian Ministry of Higher Education and soon an independent organization was developed to implement the project. In 1989, Snohetta architects

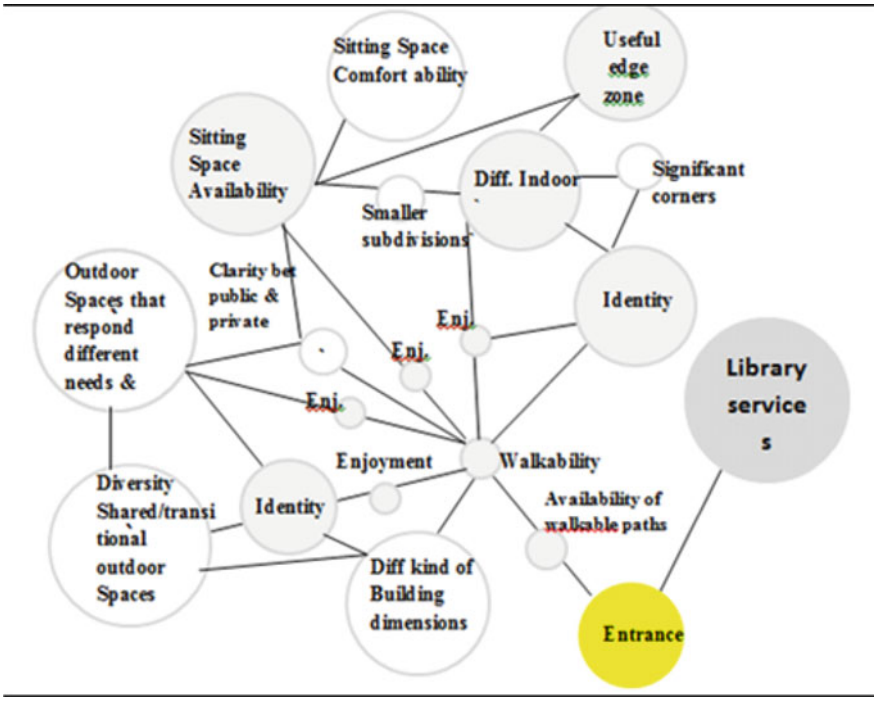


Fig. 19.1 Social integration in bibliotheca of Alexandria (*source* authors)

won first place in the competition organized by the International Union of Architects (UIA) and in cooperation with the Egyptian government, UNESCO and UNDP excelling over 524 entries form 52 countries. Registered in Norway, Snohetta architects are composed of preliminary designers from the USA, Austria, and Norway. The client's agenda, aimed at establishing a comprehensive new research library of a unique collection, serves as a catalyst for vitalization and development for the city and the entire region. Intended as a centre for pilgrimage and long-term viability, the new library was to encompass cultural and educational functions, including a planetarium, several museums, a school of information, science and conservation facilities, a young persons' library, new conference centre, and other facilities that bring about the bibliotheca as a centre for both learning and debate. The programme emphasizes basic commands as basic requirements; environmental control; maximum use of natural light and ventilation with maximum protection from direct sunlight; efficient and controlled lighting and ventilation, noise control, and sound insulation. Economics and the use of appropriate construction technology, energy conservation, are other indispensable factors programme request.

19.3.1 Ancient and New Bibliotheca of Alexandria

Through a comparison study between the ancient and the new Bibliotheca of Alexandria, the researchers found the highest social indicators' priorities that were presented in each project. It was also found that both projects aimed to function in the same way (storing knowledge) but with totally different social integrations. Actually, the Ancient bibliotheca was built to serve a certain group of people that was an excellent reason to eliminate any social connectivity to certain individuals. On other hand, the multiple distribution and multifunctional zones created in the new Bibliotheca were planned to emphasize important social indicators such as enjoyment, walkability, and identity. See Table 19.1.

19.3.2 New Bibliotheca of Alexandria

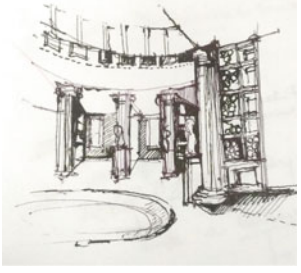
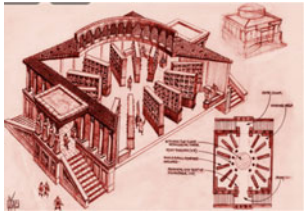
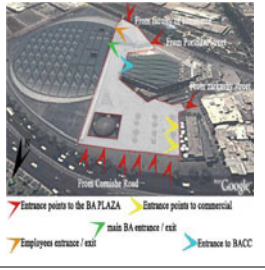
Library design raised many questions. Its direction is determined by the extreme importance of minimizing the amount of direct sunlight entering the building. The exterior of the new library is a monochrome space in the form of a wall around a cylinder (inner wall) rising above the level of the sidewalk. The walls are not at all smooth, metallic, non-tech skin, but rather curved rocks of grey granite quarried in Aswan, southern Egypt. Library visitors will first see the curved space of rough grey granite. The only violations of granite surfaces are large letters engraved on the surface, taken from many alphabets such as Latin, Roman, hieroglyphic, and Arabic (Karlsen 2006).

The library's symbolism in the form of a simple slanted disc evokes an intense, perceptible resonance and allows for an impressive space without overwhelming visitors or the city beyond. Internally, the library is large, but the scale is always human, the organization is clear, but the use is flexible, the design is grand but beautifully detailed (El-Abbadi et al. 2008; Burd 2008).

This building is technically outstanding. Its foundation is the largest round diaphragm in the world. The most distinctive feature of the building is its round shape. It is self-transcendent on the same level as complacency and does not act as part of a uniform horizontal line along the cornice. The circular shape emphasizes this outstanding object as viewed from above gives an image of the sun (Eldemery 2009; Zahran and Zahrān 2007).

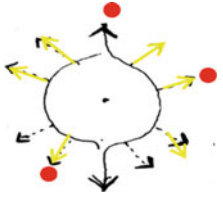
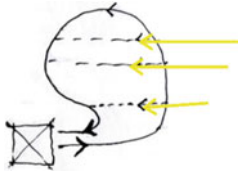
The building has a reflective pool and a large plaza that connects to the city as a meeting place for reflection and discussion, as shown in Fig. 19.2. Interior design follows function and creates a library space convenient, attractive, and inspiring for visitors. The use of the terrace inside the building contributes to the view. The BA Plaza consists of 12 olive trees arranged in three rows facing the commercial area overlooking the sea; between each tree, there is a chair to sit. Plaza is elevated from Cornish Road by 12 steps, then next two steps for each new level. Two main seats are placed in the middle of the square, one is overlooking the main entrance of the

Table 19.1 Social qualities' development in ancient and new Bibliotheca of Alexandria (*source* authors)

	Before	After	Notes/observations
	Library of Alexandria	Bibliotheca of Alexandria since 2002	
			> Both libraries have the same purpose of storing knowledge, but due to the multifunctional activities that took place in the new bibliotheca, the internal space was divided in the form of levels. It is clear that ancient bibliotheca was not a place of social gatherings or entertainment
			The entrance approach in both projects differs In case of the ancient bibliotheca, the old theory of a symmetric distribution aims to facilitate the accessibility into internal radial space. This emphasize the main functional purpose of the library away from any entertainment-social requirements. Moreover, identity has the primary social parameter In contrast to the old Bibliotheca, the new one emphasizes the multi-transitional spaces in unsymmetrical way due to the multifunctional activities that takes place in each in closed or semi-enclosed lobbies

(continued)

Table 19.1 (continued)

	Before		After		Notes/observations
	Library of Alexandria		Bibliotheca of Alexandria since 2002		
	 > Linear form + linear approaches > Radial indoor circulation		 > Radial form + radial approaches internally and externally > Linear indoor circulation		In case of the ancient bibliotheca, although the extreme linear building form, circulation and entrance approach, the indoor circulation is distributed radially. On the other hand, the new Bibliotheca of Alexandria has a radial form "semi-sphere", radial approaches internally and externally and multilinear indoor circulations
Availability of theoritical defined social indicators	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	The availability of social identity according to the researchers' observational studies
	• I (identity)	• WK (walkability)	• WK (walkability)	• WK (walkability)	
	• HS (human scale)	• B (building)	• SI (sitting)	• SI (sitting)	
	• WK (walkability)	• OS (outdoor scale)	• ENJ (enjoyment)	• ENJ (enjoyment)	
		• HS (human scale)	• HS (human scale)	• B (building)	
		• I (identity)		• OS (outdoor scale)	
				• HS (human scale)	
				• I (identity)	

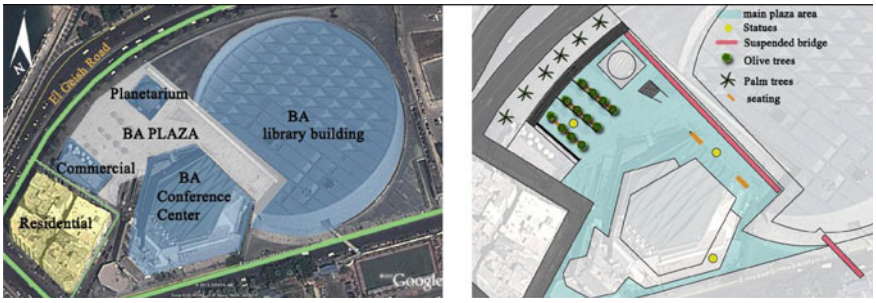


Fig. 19.2 BA complex site satellite imagery and BA Plaza diagrammatic map showing spatial analysis elements (*source* authors)

library building and the other is in the middle between the descending stairs leading to the planetarium and convention centre entrance (Fig. 19.2).

19.4 Discovering the Highest Social Item's Priorities in Bibliotheca of Alexandria

19.4.1 Questionnaire Contribution

In order to indicate the main social aspects' indicators required to build a library in Alexandria after the spread of the epidemic, it was essential to establish an expert choice questionnaire. The sample of the participants was chosen according to purposive sampling technique. They were composed of 40 experts, 50% (20 researchers in Architecture field), while 10% (4 lecturers in Architecture department, Alexandria University) and 40% (16 architects, engineers, and coordinators in the Bibliotheca of Alexandria). Due to the epidemic spread, the researchers reviewed their questionnaire in digital form through emails and thus their answers were archived and presented in graphical form as shown in Fig. 19.3.

19.4.2 Questionnaire Structure

The questionnaire (Fig. 19.4) structure was summarized as the following: at first, the researchers tried to discover; whether the new Bibliotheca of Alexandria still achieved its social theoretical goals after the spread of COVID-19 epidemic or not. The first question was clarified by reasons. After that the researchers tried to identify the main social indicators that should be taken in consideration during developing any library in Alexandria city. This previous question will help to identify the real challenges that will take place during the spread of the epidemic. Next, the experts

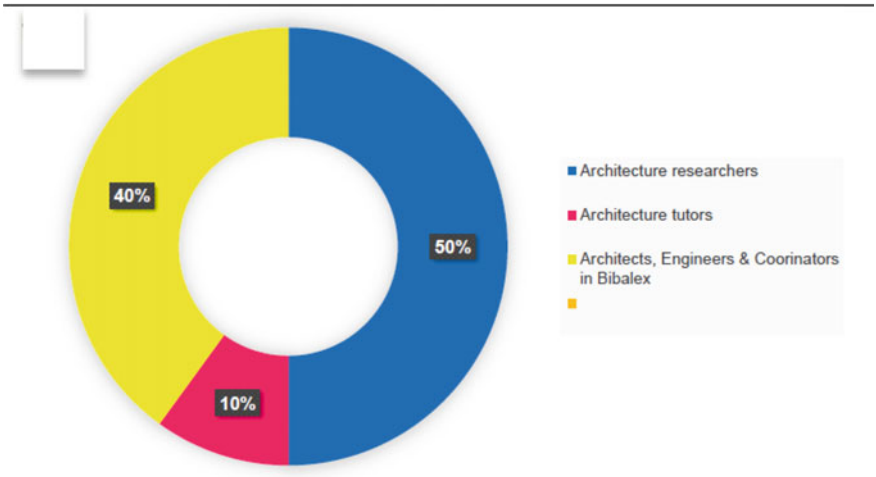
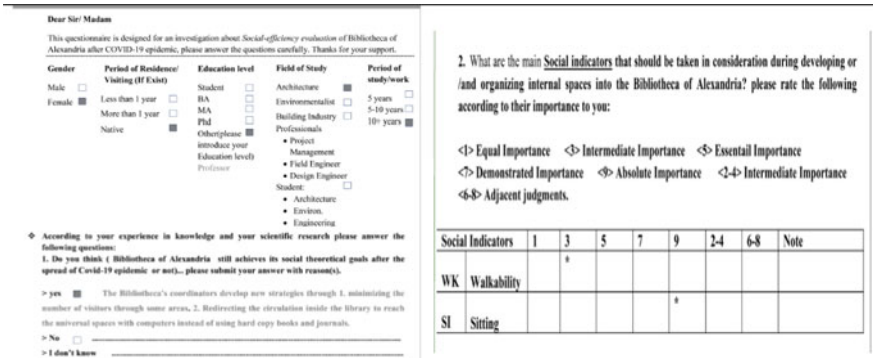


Fig. 19.3 Sample of participants (*source* authors)

were asked to choose the most seven essential social aspect qualities (categories) among 24 categories as Human Scale, Walkability, Entertainment Space availability, etc., that should be taken in consideration during building a Bibliotheca in Alexandria, in addition to the new social categories that must be taken in consideration during developing this project before and after the spread of the COVID-19 (Hanafi 2013). Their answers were rated according to Thomas Satty's rating system range (1 = equal importance), (3 = Intermediate Importance), (5 = essential importance), (7 = Demonstrated Importance), (9 = absolute importance), (2–4 = relative intermediate importance), (6–8 = adjacent judgements). At the end, the researchers asked the experts to arrange their answer according to the priority of each of the chosen social categories.


Dear Sir/ Madam

This questionnaire is designed for an investigation about *Social-efficiency evaluation* of Bibliotheca of Alexandria after COVID-19 epidemic, please answer the questions carefully. Thanks for your support.

Gender Male ☐ Female ■

Period of Residence/ Visiting (If Exist) Less than 1 year ☐ More than 1 year ☐ Native ■

Education level Student ☐ BA ☐ MA ☐ Phd ☐ Otherplease ■ introduce your Education level) Professor

Field of Study Architecture ■ Environmentalist ☐ Building Industry Professionals ☐ • Project Management • Field Engineer • Design Engineer Student: ☐ • Architecture • Environ. • Engineering

Period of study/work 5 years ☐ 5-10 years ☐ 10+ years ■

❖ **According to your experience in knowledge and your scientific research please answer the following questions:**

1. Do you think (Bibliotheca of Alexandria still achieves its social theoretical goals after the spread of Covid-19 epidemic or not)... please submit your answer with reason(s).

> yes ■ The Bibliotheca's coordinators develop new strategies through 1. minimizing the number of visitors through some areas, 2. Redirecting the circulation inside the library to reach the universal spaces with computers instead of using hard copy books and journals.

> No ☐

> I don't know

2. What are the main Social indicators that should be taken in consideration during developing or /and organizing internal spaces into the Bibliotheca of Alexandria? please rate the following according to their importance to you:

<1> Equal Importance <3> Intermediate Importance <5> Essentail Importance
<7> Demonstrated Importance <9> Absolute Importance <2-4> Intermediate Importance
<6-8> Adjacent judgments.

Social Indicators		1	3	5	7	9	2-4	6-8	Note
WK	Walkability		*						
SI	Sitting					*			

Fig. 19.4 Survey sample examples (*source* authors)

Fig. 19.5 Experts choice for the first question (*source* authors)

19.4.3 Questionnaire Results

First Question: Do you think (Bibliotheca of Alexandria still achieves its social theoretical goals after the spread of COVID-19 epidemic or not)? The experts' choice (Fig. 19.5) indicates that COVID-19 epidemic has a significant effect on the social integration quality inside the Bibliotheca of Alexandria, and thus, there should be alternative social design criteria for connecting people for knowledge. Moreover, the researchers found that the number of visitors declined after the spread of the epidemic in the city to reach 500 visitors/day in 2021, while it was 2,300 visitors/day in 2016 before the epidemic (coordinator, 2021).

Question two: After that, the researchers had to define the most required social category indicators and their highest priorities. Therefore, the experts were asked to choose the main social indicators that should be taken in consideration during developing or/and organizing internal spaces into the Bibliotheca of Alexandria **(Before the spread of COVID-19)**. The result of the second question is summarized in the following graph.

- Social activities were summarized as follows (Fig. 19.6):

  a. Sitting
     a1. Sitting spaces availability, a2. Sitting space comfortability.
  b. Enjoyment
     b1. Enjoyment, b2. Entertainment Space Availability, b3. Level of enjoyment in the entertainment spaces.

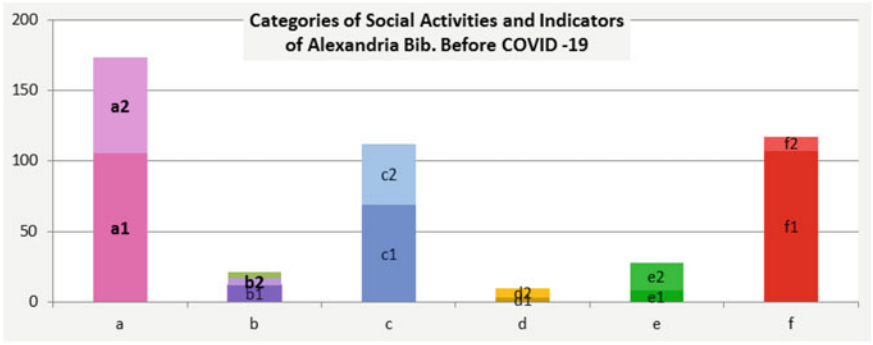


Fig. 19.6 Social activities indicator at Bibliotheca Alexandrina before COVID-19 (*source* authors)

c. Buildings
   c1. Different indoor typologies; c2. Useful edge zones.
d. Outdoor Spaces
   d1. Diversity of shared/transitional outdoor spaces, d2. Outdoor spaces that respond to different needs.
e. Human Scale
   e1. Multi-sensory human experiences; e2. Human Scale.
f. Identity
   f1. Identity; f2. Clarity between public and private spaces.
g. Walkability
   g1. Availability of walkable paths.

- Social aspect categories and their indicators calculation procedures can be summarized as follows:

Total selected indicators = 13 of different social categories.

WK: Walkability = zero.

SI: Sitting

a. Sitting Space Availability = (5 points * 17) + (4 points * 5) = (Value = 105).
b. Sitting space comfort ability = (5 pts * 6) + (4 pts * 9) + (3pints* 3) + (2 points * 1) = ($V = 68$).

ENJ: Enjoyment

a. Enjoyment = (2pts * 2) + (1 pt * 8) = ($V = 12$).
b. Entertainment Space Availability = (2pts * 1) + (1 pt * 3) = ($V = 4$).
c. Level of Enjoyment = (1pt * 4) = (Value = 4).

B: Building

a. Different indoor space typologies = (4pts * 7) + (3pts * 9) + (2pts * 7) = .
b. Useful edge zone = (4pts * 1) + (3pts * 6) + (2pts * 10) + (1pt * 1) = .

OS: Outdoor Space

a. Diversity shared/transitional outdoor spaces: (2pts * 1) + (1pt * 1) = .
b. Outdoor spaces that respond different needs and activities = (2pts * 3) + (1pts * 1) = .

HS: Human Scale

Multi-sensory human experience = (3pts * 3) + (2pts * 2) + (1pt * 7) = .

I: Identity

a. Identity = (5pts * 9) + (4pts * 9) + (3pts * 8) + (2pts * 1) = .

3.Which of those aspects qualities/ categories are most important for building a Bibliotheca in Alexandria BEFORE COVID-19 epidemic? (Select 5 of below categories).

1	Human Scale		13	Different indoor Sp. typologies	
2	Walkable Paths Comfortability		14	Entertainment Space availability	
3	Sitting Space Comfortability		15	Sitting Spaces availability	
4	Level of Enjoyment in the internal Spaces		16	Availability of walkable paths	
5	Smaller Sub-divisions		17	Identity	
6.	Outdoor Spaces that resond different needs & activities		18	Walkability	
7	Multi-sensory experiences		19	Enjoyment	
8	Architecture classification (Vernacular/ Neo-vernacular/ Modern/.....etc)		20	Outdoor transitional spaces	
9	Useful edge zones		21	Significant Corners	
10	No higher than 6 stories/ ideally 4 or 5.		22	Clarity between public and private Spaces	
11	Diversity Shared/transitional outdoor Spaces		23	Smaller Spaces	
12	Different Kinds of Public Outdoor spaces		24	Different kind of building dimensions	

Fig. 19.7 Experts' selection of indicators among 24 ones before COVID-19 (*source* authors)

b. Clarity between public and private spaces = (3pts * 1) + (2pts * 2) + (1pt * 3) = .

The experts selected 13 indicators among 24 ones defining them as the most required social indicators in order to develop a Bibliotheca in Alexandria city before the spread of COVID-19 epidemic. Thus, the experts had to choose only five indicators among 24 defined social indicators of seven main social categories (Walkability, Sitting, Enjoyment, Buildings, Outdoor Spaces, Human Scale, and Identity). The highest social priorities are sitting area availability and sitting space comfort ability, while diversity of shared/transitional outdoor space indicator (in social outdoor spaces' category) has the lowest priority value, as shown in Fig. 19.7.

On the other hand, three parameters of building category, different kinds of building dimensions, different typologies, and smaller sub-division, had not been chosen during qualifying the most essential social categories, in addition to, Walkability Category and its indicators were not mentioned in this stage.

Question three: In order to identify the critical challenges that should be taken in consideration during developing the Bibliotheca of Alexandria and after the spread of COVID-19, it was essential to define the highest social indicators and their parameters according to expert choices. Thus, the experts had to choose only five indicators among 24 defined social indicators of seven main social categories (Walkability, Sitting, Enjoyment, Buildings, Outdoor Spaces, Human Scale, and Identity). Their answers are summarized in Fig. 19.8.

- Social activities were almost the same with the introduction of walkability new aspect (g1; availability of walkable paths). The number of social indicators that

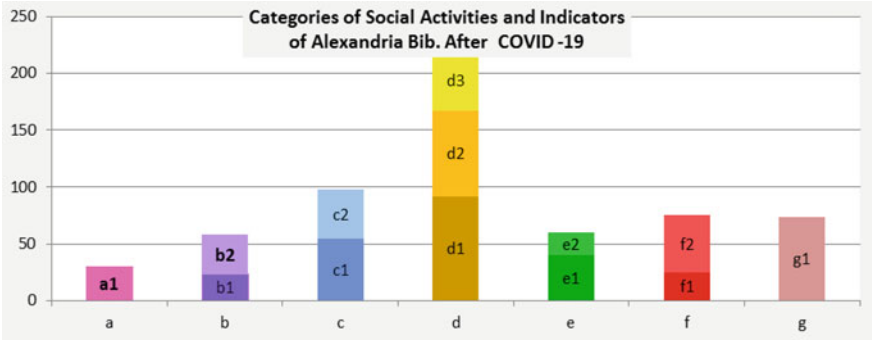


Fig. 19.8 Social activities indicator at Bibliotheca Alexandrina after COVID-19 (*source* authors)

7	Multi-sensory experiences		19	Enjoyment	
8	Architecture classification (Vernacular/ Neo-vernacular/ Modern/.....etc)		20	Outdoor transitional spaces	
9	Useful edge zones		21	Significant Corners	
10	No higher than 6 stories/ ideally 4 or 5.		22	Clarity between public and private Spaces	
11	Diversity Shared/transitional outdoor Spaces		23	Smaller Spaces	
12	Different Kinds of Public Outdoor spaces		24	Different kind of building dimensions	

Fig. 19.9 Experts' selection of indicators among 24 ones after COVID-19

had been chosen by the experts was 13 indicators of seven main social categories. After the spread of COVID-19 epidemic, the experts found that it is essential to develop the outdoor spaces that responds to different activities, shared/transitional outdoor spaces, and the availability of walk able paths indicators, clarifying that the main function of the Bibliotheca has been significantly altered as shown in Fig. 19.9.

- Moreover, the main bibliotheca function of socio-congregation was altered to social-distancing, and thus, the new digital era will have its influence on recent and newly built Bibliotheca. Furthermore, two social indicators: sitting space comfort ability and level of enjoyment in the internal spaces, had not been chosen by the experts due to their low priorities during developing the Bibliotheca of Alexandria after the spread of the epidemic.

19.5 Questionnaire Conclusion

The most immediate and visible space Earth-wide response to COVID-19 pandemic (Global Pandemic) has been repurposed public places. Decisions must depend on social activities and human needs. Comparing the social indicators before and after

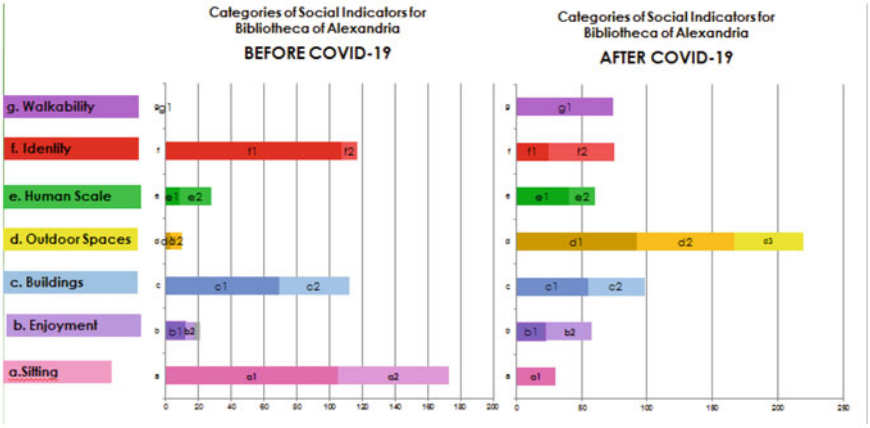


Fig. 19.10 Comparison of social indicators categories before and after COVID-19 (*source* authors)

the pandemic as shown in Fig. 19.10 revealed main aspects of people's social behavior, their need for planned outside routes and to develop the library outside plaza to maintain physical distance from separate entrances while accomplishing needed activities.

In the future, more research work can be continued to apply the deducted evaluative urban design qualities in relation to human behavioural patterns on multiple public spaces. (The researcher selected one domain site only for conducting the primary test application (the BA Public Plaza) in order to observe the behavioural patterns.) Also to inter-relate the behavioural studies with the economic status of the users as per study considerations, the financial scope can be considered in further studies.

Engage theoretical and conceptual models approached with a video monitoring as a visual tool used for observation not only photography notes are needed tools for further research.

Examining the urban theories to achieve minimal paths in post-Covid through comparing segregation vs. integrations of users in public spaces through simulation programmes and space syntax tools can also modify plaza design recommendations.

19.6 Recommendations

After observing the psychological aspect of human behaviour in bibliotheca Alexandrina library and the surrounded plaza as public space, human needs consistently come to the forefront: the need for "Comfort Personal Space" and the need for "Durable Haven" BA library must work to ensure equal access to services and resources, consider how they can successfully use open public spaces to build connections and meet the urgent and growing needs of their communities as studies indicate that the coronavirus is less likely to spread outdoors.

The most recommendations that need to be cited were as follows:

- To achieve a human scale through outdoor living rooms, adding vegetation, lighting, seating, shades, etc.
- To upgrade the quality layout of bibliotheca Alexandrina library and the surrounded plaza places to invite more people to use the space for meeting, pausing, and doing other activities.
- To add a catalogue of urban design and placement of urban furniture and signage for spaces at bibliotheca Alexandrina Plaza can define a special identity.
- The need for creating a sense of space through urban furniture elements: pavements, lighting poles, etc.
- To use interactive elements to add texture to the identity of the square and invite different user groups to interact within the space.
- To add up some outdoor workstations to invite people to use the square during work hours—combined with café-kiosk—to let the square become a destination in itself.
- To add up shaded seating areas to the square or plaza in front of commercial areas for users to sit and enjoy city scenery.
- To animate the plaza with transparent kiosks during the day, maybe for book shopping, buying concert tickets, etc. and during night to add safety to passengers' transit.
- To animate the plaza with cultural happenings, signage, and interactive maps to use it the whole day.
- To add ground signage to different signage in order to ease access to different spots of the plaza.
- To use innovative ideas such as Popup Pop out libraries, wallpaper digital shelves, wrap around art to contribute to the change in the final services provided to users, reducing time and developing of both green and smart urban spaces.

After the pandemic, designers and planners must reconsider outdoor space enhancement to create good places for interaction with innovative ways.

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Chapter 20
Cities and COVID-19: Tracing COVID Footprints in Greek Cities

Stella Manika, Zoe Gareiou, and Efthimios Zervas

Abstract Cities, as the first recipients of crises, whether financial or health-related, are shaken, transformed, and survived, highlighting their resilience. The COVID-19 pandemic laid the groundwork for transforming key urban space features. For example, we can identify changes related to the use of urban space, and even the complete lack of use, the no use of urban space, as a result of government measures to limit the viral spread. Accordingly, we can outline changes related to the rapid creation of new, urgently needed infrastructure (such as hospitals) to respond to the crisis. Meanwhile, new forms of urbanity (and city models) are being created, inspired by health criteria (or principles of walkable communities), redefining how cities are perceived (people's perception changing and actual concrete things). Greek cities, following the crisis of the pandemic, have transformed and adapted to new conditions. This article, in the first phase, reviews 1,063 articles associated with the impacts of COVID-19 on urban morphology. Then, it focuses on the Greek reality based on published material (peer-reviewed studies and articles, government documents, consumer journalism). The article aims to highlight how conditions, such as urban morphology, number, and form of open public spaces, or population density, influenced Greek cities' resilience to the pandemic.

Keywords Urban space · COVID · Pandemic · Urban resilience · Urban transformation · Healthy cities

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20.1 Introduction

COVID-19 created a new urban reality and 'global localism' condition, which lead to re-localized centers with distributed infrastructure, to innovations to face the pandemic, to less car dependence, to partnerships for funding of works related to cities, and to new methodological frameworks or tools for urban practitioners (Newman 2020). This 'new normal', that upended our lifestyle and our general attitude toward the essential issues of everyday life, on a permanent basis (Lichfield 2020), instilled '*social scarring*' (Florida et al. 2020); on the other hand, the COVID-19 created a fertile ground for more sustainable and more just and resilient cities (Sharifi and Khavarian-Garmsir 2020). As humanity is found in an unmapped territory, this period can lead to radical changes of the way of thinking (Sartorio et al. 2021); moreover, human creativity is necessary to revitalize the human dimension of cities.

20.2 Presentation of the Main Points of Literature Review

20.2.1 The Myth of Population Density and the Local Expansion of COVID-19

The coronavirus is very contagious, making it difficult to deal with locally and globally (Salama and Dupre 2020), but population density does not seem to be directly linked to the rate of spread of the virus. More specifically, it seems that if the inhabitants of densely built areas adhere to public health instructions and adapt their way of life to the new changing conditions, they can live safe in case of an epidemic (Khavarian-Garmsir et al. 2021). Urban density per se shall not be regarded as a determinant. Therefore, urban planners and stakeholders must promote the most compact city forms.

20.2.2 New Trends in Work and Commerce and Their Impact on Urban Spaces

As teleworking tends to produce great economic advantages for businesses, this arrangement seems likely to be largely maintained in the coming years, at least partially. This will bring about significant changes in working types, such as digital nomadism (Wang et al. 2020). Thus, workplaces and their requirements for building complexes will change, that is, many businesses will move into smaller spaces and change their location, either to less central districts or to more central ones. These

transformations entail changes in both the housing market and mobility, which in turn will have a decisive impact on urban spaces.

More specifically, the physiognomy of the city center will change: in the case of the relocation of businesses to the peripheries of cities, and real estate prices in the center will fall; the opposite will occur in the case of relocation of businesses to the center of cities. At the same time, as daily commuting to and from the workplace decreases, rent prices in peri-urban areas, in proximity to highways and advantageous residential neighborhoods, will rise. These districts in particular will experience increased demand for green public spaces and recreation.

E-commerce and the demand for deliveries of goods and meals had already begun to grow before the pandemic, due to the ease of using apps and the convenience of delivery services. COVID-19 has accelerated the growth of this pre-pandemic trend through the closure of physical retail stores and entertainment venues. Online transactions thus came into favor, and even with the lifting of restrictions and the reopening of brick-and-mortar retail locations, residents continue to opt for contactless purchases. Therefore, it is estimated that a large percentage of buyers will not soon return to shops, especially in city centers. The city center will therefore tend to take on a more symbolic character. However, we can distinguish sectors that 'benefit' from the pandemic conditions, such as the agricultural sector or medical services (Hadi and Supardi 2020).

20.2.3 Mobility Changes

The lockdown started for COVID-19 pandemic decreased community mobility (Saha et al. 2020) and, in a more general context, the pandemic has raised the issue of mobility as an even more complex challenge for cities due to the difficulty of adhering to social distancing measures. In a pandemic event, cycling can be an easy and almost inexpensive solution to meet the needs of traveling short distances within the urban fabric (Teixeira and Lopes 2020). Lockdown measures, teleworking, and travel restrictions have affected daily travel in several ways. In parallel, the pandemic seems to bring a positive (in the long run) transformation in tourism (Lew et al. 2020), specifically when effective practices of municipal–private partnerships appear (Rutynskyi and Kushniruk 2020).

20.2.4 Development of Peri-Urban Settlements

Rural settlements will become more popular as places of residence and remote work. Meanwhile, the ability to have a garden and grow vegetables will present an entirely new model of everyday life to those who move into these less densely populated and less urban environments. This flow will cause a spatial rebalancing between major urban centers and the surrounding areas (Graziano 2021). However, the prices of

these residences will increase, creating higher differences between rich and poor suburbs than those occurring today.

20.2.5 Environmental Perspectives

Prior to the pandemic, discussions were already underway about travel habits and the necessity of limiting emissions. The markedly reduced frequency of travel (road, rail, air) and the increase in hiking, cycling, etc. on the empty roads have had the benefits of enhancing air quality, and minimizing greenhouse gas emissions and noise levels. Environmentally, restricted mobility, the absence of motor vehicles in urban areas, the reduced level of economic activity, and the widespread adoption of teleworking initially resulted in the abrupt reduction of air pollutants. Many cities around the world recorded significant improvements in air quality (Sharma et al. 2020; Saadat et al. 2020), while reduced mobility or changes in mobility patterns as a result of the pandemic provided a new basis for studying atmospheric chemistry (Sicard et al. 2020).

20.2.6 Smart City Strategies and COVID-19 Resilience

Smart cities are more resilient than traditional cities in response to pandemics, earthquakes, tsunamis, fires, etc. The integration of new technologies into the services provided by state and local governments enhances urban resilience to emergencies utilizing the available smart city technologies in a critical part of the fight against the disease (Sonn and Lee 2020) and sharing and communicating information with citizens in real-time (Santos et al. 2020).

20.2.7 Changes in the Built Environment

Middle and high-income families' housing standards will change, as typical housing will come to include a workplace since many employers (such as Facebook or Google) announced plans for large-scale, long-term shifts toward teleworking (Frumkin 2021). This change may lead to a stronger social division between manual workers and those who can work from home via a computer since higher-paid workers usually have more flexibility to work from home than those found on the lower levels of the economic ladder (Parker et al. 2020).

20.2.8 Changes in Urban Planning Approaches

COVID had an impact on the livelihood of urban areas (Allam and Jones 2020). The dominant approaches to urban design seem to have evolved since the onset of the pandemic. More specifically, new considerations, such as those stemming from the principles of walkable communities and tactical urbanism, have entered the spotlight. The term 'tactical urbanism', as it is called, or the tactic of direct interventions, refers to direct, inexpensive, temporary, and evolutionary interventions and/or policies, which are mainly anthropocentric and designed to improve the city's environment.

During the COVID-19 crisis, tactical urbanism was implemented as a quick fix (without lengthy procedures), a group of 'soft' actions (Graziano 2021) at the city, and even neighborhood, level with the implementation of social distancing rules intended to help nation's battle against the coronavirus spread.

Some towns and cities around the world have handed over their roads to pedestrians and cyclists, taking advantage of the crisis as an opportunity to evolve into more sustainable and resilient cities, contributing to behavioral changes, such as the adoption of cycling and the increase of the outdoor recreational activity (Venter et al. 2020). Since the COVID-19 pandemic started, an increasing number of cities have made efforts to replace a portion of travel by public transport (and by private car) with bicycle traffic.

20.3 Literature Analysis

This study aims to outline COVID-19 research related to urban forms by reviewing literature published from 2019 to 2021 and using the R language environment for text mining and bibliometric analysis of scientific articles. Other researchers used the same method focused on a more broad design covering diverse research on urban planning and management, and the impact of COVID (Sharifi and Khavarian-Garmsir 2020). The Web of Science collection was selected as the main data source. Our search terms are focused on the one hand on urban or city morphology/forms/models/transformation/planning/policies and public open spaces and also on the COVID-19 pandemic. The period analyzed was from 2019 to 2021. Only papers published in English were selected. About 7088 documents were chosen for analysis but eventually limited to 1063 due to their relevance to our topic and imported into bibliometrix and biblioshiny, open-source packages that are used from the R language environment and enable completion of the scientific literature analysis and data processing (Aria and Cuccurullo 2017). The main data used are shown in Table 20.1.

Figure 20.1 demonstrates the keyword co-occurrence network. The number of instances of keywords is depicted across the scale of the cycle. When the keywords of the authors have been most jointly selected, the cycle is larger. Different cycle colors have been attributed to individual clusters. We can distinguish three dominant clusters and a significantly smaller one.

Table 20.1 Main information about data used

Timespan	2019:2021
Sources	575
Total number of documents	1063
Average years from publication	0.261
Average citations per document	6.041
Average citations per year per doc	4.237
Document types	
Article	939
Article; early access	124
Document contents	
Keywords plus (ID)	1269
Author's keywords (DE)	3002
Authors	
Authors	5020
Author appearances	6034
Authors of single-authored documents	105
Authors of multi-authored documents	4915

Fig. 20.1 Keywords' co-occurrence network map (*source* authors)

The main cluster reflects the main concept of the study. More specifically, this cluster shows the connection between health issues, as they arise during the pandemic period and the particular characteristics of the urban environment through mainly physical activity. Findings indicate the connection between the city and its design, especially propelled by accessibility and walkability, urban policies, and environmental management. In the second cluster, emphasis is placed on mental health and its various aspects (such as depression or anxiety). The interest in this cluster is the connection of mental health with the neighborhood. In the third cluster, emphasis is given to COVID-19 exposure, transmission, and mobility. The previous results are also verified in Fig. 20.2. In addition, in this figure, we can see the sub-themes of the two dominant clusters and how they are connected. More specifically, the connection of the role of walking, access, and neighborhood in shaping the special mental characteristics of individuals is highlighted.

Thematic maps are created based on density and centrality (Fig. 20.3). Density and centrality were split into four thematic quadrants as shown in this Fig. 20.3. The top right quadrant is a driving topic. It is notable for its high density and centrality and triggers the most important findings of this research. In this quadrant, there are themes of health disparities, social determinants of health, and neighborhood. The high development in the top left quadrant is indicated by high density but low centrality. The topics of that quadrant refer to issues related to urban policy, urban parks, and perceived risk and telemedicine, telehealth, and trust issues that have been of great interest for many years but now tend to move to the forefront. These topics marked low centrality. At the heart of this quadrant, we can see the urban design, social distancing, and built environment. The bottom right quadrant is a fundamental

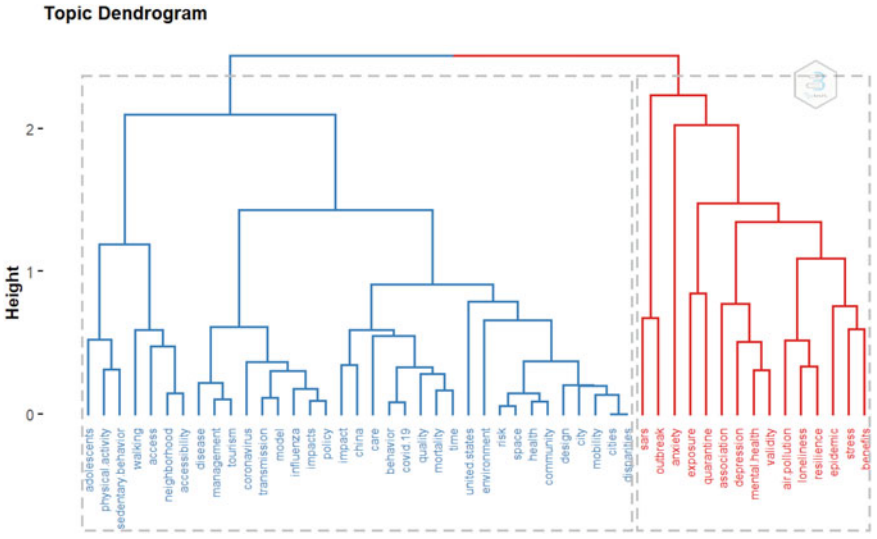

Fig. 20.2 Topic dendrogram (*source* authors)

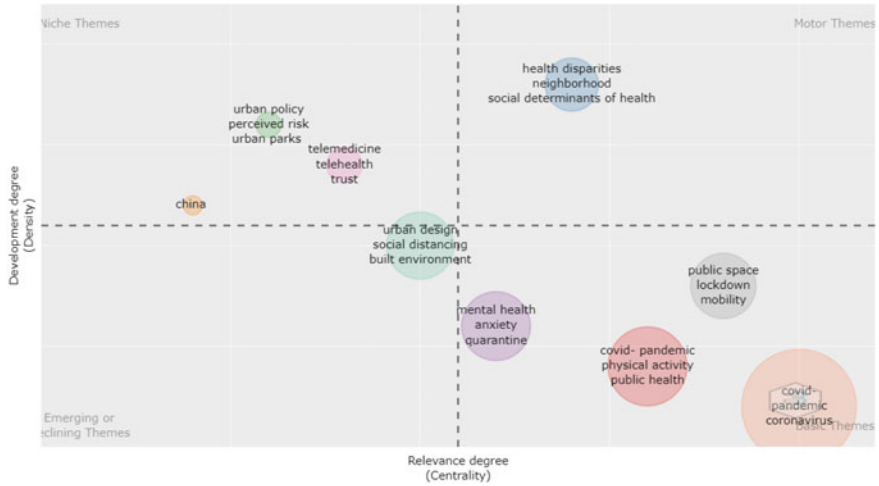

Fig. 20.3 Thematic map (*source* authors)

topic of high centrality but low density. Our main interest, in this case, focuses on public space, lockdown, mobility, and physical activity public health.

20.4 The Case of Greece

The pandemic seems to have already significantly, and even more possibly in the future, affected the perceptions and experiences of the active population of Greece (Vatavali et al. 2020). Greek cities are compact and they contain urban centers featuring dense construction and few parks, squares, or private outdoor spaces (Manika 2020). At first glance, they could be mistakenly considered as more vulnerable than less compact cities to the spread of viruses, but our recent lessons learned from the COVID-19 pandemic have shown that the most decisive factor is not only the number and extent of public outdoor spaces but also their attractiveness.

There was also a significant change in the mobility patterns of Greek citizens, who began to avoid public transport in favor of more private means of transportation compatible with social distancing as well as to rediscover walking and cycling as healthy and pandemic-safe forms of movement, thus conquering urban spaces (Vatavali et al. 2020). At the same time, new design approaches, such as that of tactical urbanism, have been incorporated by the municipality of Athens into a design for its city center, the 'Great Walk'.

Greek cities, as a result of COVID-19, seem to be getting smarter as they integrate digital technology into urban resources and services in the interest of improving the daily lives of residents. This new challenge for local governments requires quick

reflexes in the redirection of funds as well as in communicating with and educating the public.

20.5 Conclusion

According to our findings of review analysis, the bibliometrix analysis, and the special spatial urban characteristics of Greek cities, we can say that in the case of Greece, the traditional 'invariants' welcome changes. The decisive factor is not only the number and extent of public outdoor spaces but also their attractiveness. In Greek cities, during the pandemic, we observe new characteristics of urban space, a transformation of consumer urban space, and temporal urban rhythms. In parallel, new mobility patterns and travel behaviors have emerged in a more 'human measure' of Greek cities, while emphasis is now given to a planning approach focusing on spaces 'in-between' and not only on nodes and networks and in the use of short-term and responsive, tactical, planning methods.

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Chapter 21
Learning from the Post-Covid-19 Pandemic Experiences

Edmond Manahasa

Abstract The COVID-19 pandemic marked a threshold in everyone's life, consequently generating new spatial paradigms in architectural and urban sphere thinking. Especially, the relationship between man and space became a major subject of interrogation. The pandemic context required distant communication, remote working and learning, and isolation. Considering the possibility that similar pandemics might repeat the process revealed naturally certain lessons from which we must learn. First, it revealed the role of public spaces as a very important spatial quality that became quintessential in such a context. As such, their design and reconceptualization, especially in spatial terms, need to be reconsidered. Especially in mass and multi-family housing developments, their presence quantitatively and qualitatively needs to be increased. Interestingly, the remote working and teaching processes were also tested during the pandemic, and we learned that, apart from the limitations in terms of quality, there is a lot of potential in the distance working and learning process, not only in professional aspects but also in pedagogical aspects. Although it pushes towards more virtual reality, the pandemic worked as a "live" experience to understand the potential and extent of digital technologies in making such a reality possible. Last but not least, the lesson was related to the personalization of space through isolation for pandemic spread prevention reasons. Also, in this aspect several experimental designs were proposed; however, the nature of this operation on its own is featured by ontological limitations. Finally, it can be said that these lessons should rapidly be reflected in architectural and design pedagogical processes aiming to train the next generation of architects/urban planners. Also, the reflections should be implemented in the curricula and courses of these programmes, in order to avoid similar situations with adequate architectural solutions.

Keywords Learning · Post-pandemic · Experiences · Lessons

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21.1 The Importance of the Open and Public Spaces

The most important lesson learned from the COVID-19 pandemic is undoubtedly related to the need for re-exploring the potential of open spaces, which can provide the required spatial and social qualities for the pandemic context. Architects and urban designers should consider, re-conceptualize, and provide different scenarios for efficient utilization of shared common spaces and appropriate spatial experiences during similar outbreaks.

While the importance of open public spaces is obvious, their appropriate usage remains a challenge since, as major gathering spaces, they at the same time work as primary spatial tools for pandemic spread. On the contrary, medium and small-sized open spaces (Abdelkader et al. 2023) are more appropriate spatial scales to provide not only the needed daily airing but also to limit contact with a large number of people. In this context, the density of the urban settlements is the major concern, which directly impacts the outbreak in relation to public spaces. In the first part of this proceeding book, Naselli et al. concluded that there is an emergent need to carry out detailed investigations into the natural water of Tirana to have a solution in the future, especially considering the enormous impact that it has on the densely urbanized environment. Calace et al. emphasized the importance of the city suburbs, which, compared to historical inner towns, offer less density and more appropriate spatial qualities that provide resilience in the pandemic context. However, since from an urban design point of view they are neglected, architects and planners should consider, through different scenarios, not only their spatiality but also their socialization potential.

Especially Geropanta and Porreca revealed the need for varying scenarios that should include sustainable collective and individual mobility in order for public spaces to work as an anti-pandemic tool (De Luca 2020). Especially, the model of "15 min city" (Moreno et al. 2021) is a good example of not only providing walking or bicycling distance but also based on the principle of proximity providing good socialization qualities. Also, the reconceptualization of easy access to blue-green infrastructure should be considered. To achieve this goal, new urban interventions within existing cities must be such that just by walking or running (Elmqvist et al. 2013), the blue-green infrastructure is reached to ensure that ecological and environmental needs are fulfilled. Furthermore, Franchino and Frettoloso express the importance of the increase of this infrastructure in existing city fabric via urban transformations as an important tool that is very helpful to overcome the pandemic. This means that the green areas and water features in the existing cities should be increased.

Although in terms of land sustainability it might be disputed, a good idea is also the development of coastal communities, which are promoted by Acierno, and green communities, which were proposed by Angrilli and Ciuffreda, that would provide not only the required spatial expansion to avoid contagion but also due to their spatial-geographical features, are suitable to develop the socio-recreational potential, which is much needed in pandemic conditions. Obviously, the urban peripheral zones'

citizens, due to their easy access to coastal or mountainous areas, have proved to be more pandemic-resilient and have a good potential to be transformed into such societies.

21.2 The Need for Adapting New Approaches in Design Processes and Building Typologies

The design processes as well were impacted during the pandemic, and this study reveals certain lessons, especially how to facilitate the teaching processes utilizing non-face-to-face situations. As such digital facilitation design tools can be useful. Kim et al. found that videoconferences are helpful tools from the initial to final design phases. They also stated the importance of utilizing whiteboard-based tools for brainstorming and communication, whereas for the detailing phase, they stated the need for developing programmes that provide 3D and stereoscopic qualities that can enable the expression of outputs produced through collaboration. Adaptation of school buildings and spaces in the case of similar outbreaks needs to be based on three indicators, according to Sicignano et al., which are behavioural, technological, or spatial-functional. Another lesson we learned from the pandemic is that adaptation is easier when dealing with normal students or pupils, whereas the challenges are much greater when it comes to adapting the schools for kids with special needs, according to Ibrahimi and Saliu.

Pietrogrande and Caneva highlighted the importance of a modular mobile medical testing unit, which can be placed in the piazzas of larger towns as well as in small villages. Apart from moving the medical personnel, facilitating medical check-ups, and anticipating and fighting epidemiological phenomena, the concept of the presence of the university in the territory can also be utilized. Yunitsyna and Fallanaj also recommend the use of modular transportable container passive houses that can be easily assembled and dismantled and can work as isolated houses or remote shelters (Brostrom and Howell 2008), thus providing the needed segregation in a pandemic context. Similarly, Yunitsyna et al. proposed prefabricated modules located in the peripheral zones that work as self-sustainable, energy efficient, and possess a generic plan to the maximum that generates functioning coworking spaces (Di Marino et al. 2023). Such modules are low-cost, replicable in different peripheries and can be useful dwelling tools in a pandemic context.

Finally, Rashed et al. recommend that during a pandemic context, the management of the archaeological sites must ensure cooperation with innovative technologies and media. Furthermore, it remains crucial to establish relationships with tech businesses to realize a rapid digital shift and to provide access to online capacity development programmes on culture and sustainable tourism.

21.3 The Environmental Psychology of the Pandemic, Measures, and Post-pandemic Reflections

Maintaining the needed psychological health during the pandemic brought into discussion different challenges related to this aspect. Dantas et al. emphasized the issue of increasing isolation during the COVID-19 pandemic, particularly amongst older and more vulnerable citizens who were forced to live without communication, generating a "loneliness epidemic". A lesson that Dantas et al. revealed was the need for the establishment of training centres to secure connections through digital technologies that can provide communication and stimulation of cognitive functioning to delay or prevent advanced stages of dementia and increase socialization in society. As such, these centres can help in the mitigation of loneliness and social isolation and can be useful in the post-pandemic context (Moser et al. 2020). Especially for older adults, Hernandez and Fernandez recommend using age-friendly (Chao 2017) artificial intelligence via sensors to overcome isolation during the pandemic, which they called "AIsola" and applied in the city of Tampere in Finland.

Durmuş Öztürk reveals that in a non-face-to-face teaching process with students of architecture, the usage of binary positions can produce interesting and rich compositions by relying on the deconstructivism theoretical grounds of Derrida as a strategy of critical analysis (Benjamin 1988) and can be achieved. Furthermore, she underlined the fact that students gain different digital skills and freely realize their own digital narrative in the digital environment. Also, the use of the digital deconstruction model strengthens motivation, increases participation, and supports the learning process, and via online presentation opportunities, the students were able to disseminate their work to large audiences.

Similarly, Severino and Lameiro, in their experiment with architecture students within the course of graphic design, recommended the use of streamlining of classes and a variety of learning-aided virtual teaching techniques, including group, custom, and theme zoom sessions. Moreover, they found these techniques brought security to the students to develop their projects with the constant support of the teacher.

Callace et al. propose the use of an "open-air laboratory" that can work as a teaching method, which they implemented via a project called La.Stre. In fact, they argue that the transformation of a heavily degraded suburban neighbourhood into an "open-air laboratory" by networking all the human, economic, and environmental resources of the territory can be very helpful to promote the growth of employment and the use of the skills of the local economy, and consequently, their well-being in the Post-Covid context.

Bayumi et al. revealed several actions that can increase the usability and provide equal access to services and resources of a major library building like Bibliotheca Alexandrina in Egypt, like the achievement of a human scale through outdoor living rooms, the upgrade of a quality layout of the Bibliotheca Alexandrina library and the surrounding plaza places to invite more people to use the space for meetings, pausing, and doing other activities, and the use of innovative ideas such as pop-up pop-out libraries, wallpaper digital shelves, and wrapping around art to contribute

to the change in the final services provided to users, reducing time, and developing both green and smart urban spaces.

Similarly, Manika et al. highlighted the impact of the pandemic on the cognitive behaviour of the citizens evolving in new urban spaces in Greek cities, which is characterized by a transformation of consumer urban space and temporal urban rhythms. They reveal the fact that during the pandemic, new mobility patterns (Sicard et al. 2020) and travel behaviours have emerged in a more "human measure" of Greek cities, recommending a planning approach focusing on spaces "in-between" and not only on nodes and networks and in the use of short-term and responsive, tactical, planning methods.

21.4 Summary

Summing up, it can be said that this conference produced key lessons regarding the importance of open and public spaces in a possible future pandemic, emphasizing the importance of small and medium-sized scale of spaces. It also revealed the need for adapting new approaches in design pedagogical processes, emphasizing the role of digital tools and the need for new building typologies and spaces, which must be featured by characteristics that generate resilience like modularity, mobility, flexibility, artificial intelligence, self-sustainability, and energy efficiency. Lastly, the conference extracted insights from pandemic environmental psychology. Moreover, it proposed measures to overcome different socio-psychological challenges related to mental health that will be helpful in similar outbreaks, which within the global dynamics unfortunately can reoccur.

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